GLOGIFT 17

Seventeenth Global Conference on Flexible Systems Management

Theme

Transforming Organizations through Flexible Systems Management

Annual Conference of Global Institute of Flexible Systems Management

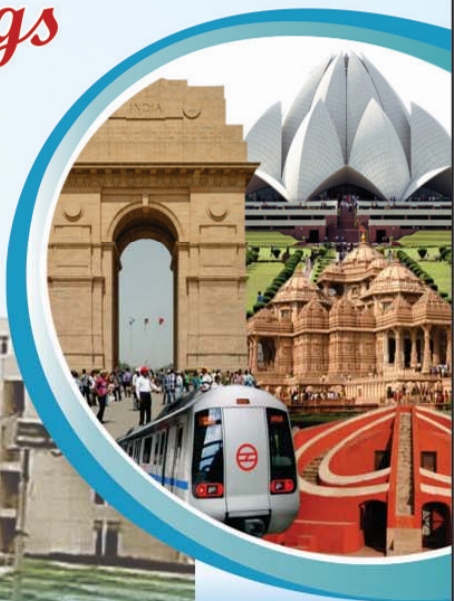
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Contents

STREAM - A

Paper 1 Waste Generation and Planet's Sustainability at Current Level of Consumption
Sudeshwar P Singh

Paper 2 Flexibility in Corporate Governance Practices: An Inter - Industry Comparison from India
Monika Singla and Shveta Singh

Paper 3 Learning, Innovation and Entrepreneurship towards Flexibility
Sumant Kumar Bishwas and Sushil

Paper 4 Sustainable Growth Rate: A Flexible Performance Measurement Tool for Changing Business Environment
M. Rajesh

Paper 5 Operational Excellence for Strengthening Customer Stickiness
Hariprasad Reddy K and Devender Malhotra

Paper 6 Modeling Enterprise Flexibility and Competitiveness for Indian Pharmaceutical Firms: A Qualitative Study
Asim, M and Nasim, S

Paper 7 B2B E-Commerce Adoption Framework in Agriculture: Evidences from the Case Study Ofnam
Sanjay Chaudhary and P.K. Suri

Paper 8 Strategic Flexibility of Indian Corporates – A Study of Market Response to Cross-border Acquisitions
Samta Jain, Smita Kashiramka and P.K. Jain

Paper 9 Relevance of Flexible Business Applications for Organizational Sustainability in Rapid Changing Business and Technological Environment
Himanshu Singhal and P.K. Suri

STREAM - B

Paper 10 Total Interpretive Structural Modeling (TISM) of the Determinants of Non-performing Assets in India Banking Sector
Noor Ulain Rizvi, Smita Kashiramka and Shveta Singh

Paper 11 Impact of Global Financial Crisis on stock market comovement in Europe
Nisha Mary Thomas, Smita Kashiramka and Surendra. S. Yadav

Paper 12 Foreign Exchange Risk Management by Companies: A Systematic Literature Review
Archana Singh and Varuna

Paper 13 Gold as a Hedge Against Purchasing Power Risk
Narinder Pal Singh and Navneet Joshi

Paper 14 Market Efficiency, Global Financial Crisis and Price Risk Management - An Evidence from Indian Gold Futures
Narinder Pal Singh and Archana Singh

Paper 15 Contribution of Financial Inclusion in the Growth of Indian Economy: An Exploratory Study
Diksha Sahni and Ankita Dhamija

STREAM - C

Paper 16 Ingredients of Startup Success
Abhishek Kumbhat and Sushil

Paper 17 Corporate Governance in the Changing Scenario
Khushboo Gulati and Seema Gupta

Paper 18 Digital Transformation-Bank Aggregator System
B.V. Ramana, S. K. Bhol and M. K. Das

Paper 19 Developing Core Competence, Competitiveness and Institutional Excellence in Uncertain & Challenging Economic Environment: A conceptual model for Indian Higher Education Institutions
Mohammad Akhtar and Sushil

STREAM - D

Paper 20 Linking Forgiveness and Satisfaction with Life in Employees:An Empirical Study
Rinki Dahiya and Santosh Rangnekar

Paper 21 E-governance Policy of India: A Step Towards Sustainable Development Goals (SDGs)
Rakesh Gulati and P. K. Suri

Paper 22 Developing Multi-criteria Based Decision Support Framework for Sustainable Healthcare Waste Management in India
Ankur Chauhan

STREAM - E

Paper 23 Knowledge Management Performance Measurement: Systemization of Literature for Development of a Scale
Meenu Chopra and Vikas Gupta

Paper 24 A Generalized Model of Flexibility MeasurementUsing Business Environmental Factors and Flexibility Enablers
Sanjai Kumar Shukla and Sushil

Paper 25 Impact of Components of Globalisation on the Economic Growth in India: An Empirical Study
Shikha Gupta and Nand Kumar

Paper 26 Financial Performance of Disinvested Public Sector Enterprises in India
Seema Gupta, P.K. Jain and Surendra S. Yadav

Paper 27 Measuring Effect of Supply Chain Design on Firm Performance Using Bayesian Networks
Ravinder Singh, Satyendra Kr. Sharma and Rajesh Matai

Paper 28 Determinants of Borrowing by Poor: Evidence from Urban Slums of Mumbai in India
Shruti and GC Maheshwari

STREAM - F

Paper 29 Risk Governance Structure and Firm Level Competitiveness: Evidence from India
MV Shivaani, Surendra S. Yadav and PK Jain

Paper 30 Comparative Study of Select Ventures in E-waste Management: Exploring Scalability Related Problems
Kaushal Kothari, Lalit Lalwani and Kirankumar Momaya

STREAM - G

Paper 31 A Content "Analysis" of Leaders Communication: Special Reference to Public and Private Banks in India
KP Kanchana and Archana Singh

Paper 32 Employers' Perception on the Predictors of Graduate Employability in Information Technology Sector
Nidhi Sehgal and Saboohi Nasim

Paper 33 Measuring the Relationship between Job Resources and Employee Engagement: A Study of Generation Y Employees
Shikha N. Khera and Sahil Malik

Paper 34 Talent Management : A Critical Imperative for Organizational Excellence
Nitin Girdharwal

Paper 35 Job Conditions Mediating the Relationship between Commitment to Managers and Company and Employee innovation
Abhishek Singh and Santosh Rangnekar

Paper 36 Role of Flexible Working Timing in Managing the Employees of Organisations: A Case Study of Flexible Work Timing of Some Retail Outlets in Patna Region
Faryas Kausar Ansari

Paper 37 Supporting Culture as Transformational Strategy in Call Centres in India: Examining its impact on Job Satisfaction with Stress and Career Advancement as Mediators
Monica Verma

STREAM - H

Paper 38 Exploring the Relationship between Ethics and Knowledge Management: A Conceptual Framework for Successful Organizations
Nishant Gaur and Vikas Gupta

Paper 39 Revolutionizing Indian Higher Education through Knowledge Management and Information and Communications Technology: A Conceptual Model
Namita Jain and Vikas Gupta

Paper 40 Knowledge Management- Key Lever for Business Transformation: A Case of an IT Organization
Hariprasad K Reddy and Archana Singh

Paper 41 Changing the Workplace with Technology Driven Flexible Management
Annapurna, A. Guruprasad and Y.S. Murthy

STREAM - I

Paper 42 Antecedents of School Branding: A School Leaders' View to Develop School Branding Model
Anurag Chauhan, Harish Chaudhry, Shikha Sota and Apurva Chamaria

Paper 43 Effect of Brand Loyalty on Brand Equity: The Mediating Role of Brand Extension
Richa Joshi and Rajan Yadav

Paper 44 Channel Collaboration in E-Commerce: A Study on Channel Relationship from the Perspective of Vendors Selling on Online Platforms: The E-Retailers
Rajan Yadav and Swati Bhatnagar

Paper 45 Electric Mobility Adoption in India: Emergence, Challenges and Implementation Roadmap
Kumar Shalender

Paper 46 Moderating Effects of Gender on Online Shopping of Wooden Handicraft Items
Rohit Yadav and Tripti Mahara

Paper 47 Understanding Consumers' Inclination Towards Pepsi® Facebook Brand Page (FBP) Posts: A Sentiment Analysis Approach
Anurag Tiruwa, Rajan Yadav, P.K. Suri

Paper 48 Factors Affecting Adoption of Digital Payment Systems: A Case Study on Allahabad City, Uttar Pradesh
G. P. Sahu and Naveen Kumar Singh

Paper 49 Plastic Currency : Gateway to Cashless Society?
Komal Dhanda and Usha Arora

STREAM - J

Paper 50 Relationship Between Self- Efficacy Optimism, Personal Optimism and Career Planning in Manufacturing Sector
Teena Bharti and S. Rangnekar

Paper 51 Developing a Framework for Green Flexible Manufacturing System
Dimple Bhandari, Rajesh Kumar Singh and S. K. Garg

Paper 52 Impact of Lean Manufacturing in Bulker Manufacturing Organization: A Case Study
Sahastranshu Chaurasia and A.C Shukla

STREAM - K

Paper 53 Ranking of Best Practices of Logistics Service Providers using Fuzzy AH
Anchal Gupta, Rajesh Kumar Singh and Pradeep Kumar Suri

STREAM - L

Paper 54 BIG DATA: Transforming Governance for Enhanced Citizen Participation
Charu Verma and Pradeep Kumar Suri

Paper 55 Process re-engineering model of Dealer E-Assessment- A Digital Transformation for Secure, Assured delivery System Contributing to Green Governance
Saurabh Gupta, Ashesh Agarwal and Amita Srivastava

Paper 56 Intersection of Big Data and Knowledge Management for Organizational Competitiveness
Vikas Gupta, Asha Thomas and Timsy Sardana

STREAM - M

Paper 57 Using Flexibility in Designing CRM Solution
Himanshu Dutt and Kavita Chauhan

Paper 58 Flexible Management through Secure Digital India Initiative of the Government
Archana B Saxena and Sanjive Saxena

Paper 59 Understanding Public Value of a Few e-governance Projects in India
Parul Jain Gupta and P.K.Suri

Paper 60 Augmented Transformational Methodologies for Effective e-Governance
SMMM Kalyan Kumar and S C Pradhan

Paper 61 Factors Critical for CRM Success
Saurabh Singh and Kavita Chauhan

Paper 62 An empirical Study of Occupational Safety and Health with Special Reference to Certification of Employees
Meha Joshi

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pp. 1-21

Waste Generation and Planet's Sustainability at Current Level of Consumption

Sudeshwar P Singh[1]

Abstract

Human beings have been able to decode the law of nature to a very large extent starting with late seventeenth century. This has led to high level of consumerism and materialism in society with the use of science and technology coupled with innovation on market and socioeconomic front, ushered in very high level of social and economic inequality, and huge consumption of non-renewable materials, energy sources and other resources. On the one hand, level of comfort and luxuries got increased for those, who are able to coordinate and participate in consumerism and materialism, and acquire and harness the relevant skills, but remained cursing for those who could not participate in harnessing those opportunities on the other. In the race of consumerism and materialism, human being has been able to conquer time and space, controlled the nature like death rate through medical facilities and advancements, challenged the darkness by manmade lighting and chosen their own timeframe of working, however, separated the workplace from residence, higher level of urbanization, huge significance of education and training, unique lifestyle and comfort in daily routines in terms of food habits, hygiene like use of sanitary diapers, use of air-conditioners and supportive utensils like dishwashers, washing machines and electronic devices for communication, and so on, while creating his or her own environment different from specified by nature. Facilitation for all these required suction of physical resources of gigantic order and produced huge externality in terms of waste generation and environmental hazards like greenhouse gas emission, global warming, acid rain, rise in level of ocean to such an extent that survival and sustainability of human race on this planet are at the verge of getting questioned. Not only the current civilization is going to face a crisis for survival but also planet and its environment is threatened for its sustainability. The central issue remains a decision on economic development and growth versus that on environmental externalities, meaning a decision on driving engine versus broader goal of civilization in the light of environmental and civilization's existence, sustainability and spirit.

Keywords: Consumerism, Consumption, Economic Development, Externality, Sustainability, Waste Generation.

Introduction

During 52,000 years of human existence from the age of hunters and gatherers through pastoral, agrarian, and traditional civilizations, human beings arrived at the modern age (Giddens 2009, 2013), whereby individuals are enjoying not only mechanized and luxurious life style but also automated and digitized way of living, social interactions and transactions, while harnessing the nature for material benefits and damaging the environment. In this unidirectional process tailored

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for luxuries and personal enjoyment in the current period, individuals not only forgot and undermined the coexistence of their fellow-beings and other species (Figures 7, 9 and 10) but also manipulated the nature and sucked in huge quantum of resources from mother planet (Figures 6 and 7), which questioned the natural functionality of environment. It got immersed in the business of mega-scale consumption of material resources to such an extent that it is not only sucking the non-renewable resources but also approaching to a situation of swallowing the human civilization itself, while generating giga-level debris and hazardous wastage. The whole process got driven by unique belief of Puritanism, a faith in Protestants' culture for material consumption in such a manner that it is nullifying others. The process got further complicated as human race wants to maximize their current level of pleasure and benefits at the cost of that will remain available for future generations, without caring for availability of non-renewable resources, polluting environment and dumping with undesirable and harmful debris and materials, which is at the verge of questioning the sustainability of environment on the mother planet leading to threat on existence of current civilization on one hand and bio-diversity on the other. One can get a feel for level of environmental externalities in the race of economic growth.

Human mind has been engaged in identifying and innovating unique things during its course of journey in the process of its existence. Moreover, since 50,000 BCE through 1,700 CE, human race had been more or less in conformance with nature virtually without any sign of environmental externalities. However, starting with decoding the nature's behavior by Sir Isaac Newton (1643-1727) and subsequent inventions equipped the world with unique scientific knowledge (1687), which was complemented by distinct learning underpinned by Sir Adam Smith (1723-1790) through division of labor and their specialization (1776-1787) gaining team productivity of the order of 100 to 1000 times (Smith 1904). Subsequently, it was further escalated by invention of inanimate power sources like steam engine (1712) and electric motor (1821) a unique development and subsequent application of science and technology, especially in Europe, the industrialization process got ushered in. This revolutionized the process of human interventions in nature for material benefits in society of gigantic order, which was further fueled by Puritanism (a unique belief by Protestants' faith in Christianity) by increasing the scope for materialism and consumerism manifold (Weber 1950; Giddens 2009, 2013). There emerged the issue of conflicts between process of value creation, waste generation and that of value capture for material benefits at the cost of environmental sustainability and that of civilization. To continue on this tread mill of conflict between value capture and value creation through above mentioned process of industrialization in seventeenth and eighteenth centuries, Europeans started commercialization on mega scale for whole world by heavy emphasis of accelerated colonization with the use of military power, which itself got modernized through these scientific and administrative inventions and practices. Finally, the baton was grabbed by Americans in the last quarter of nineteenth century and Henry Ford (1863-1947) started batting with his unique concept of mass production, and mass consumption, which was partnered by Fredrick W Taylor (1856-1915) with his unique technique called scientific management, which got furthered by Alfred P Sloan (1875-1966) offering choices to customers and also with involvement of a galaxy of technology and management thinkers of 20th century through exploration of technological and management practices in fields like design, engineering, marketing, finance, human resources, economics, information technology, quality management and strategy with mega scale use of technology and inanimate power leading to exponential growth in scale and scope of productivity (Deming 1966, 1993, 2000; Juran 1964, 1980; Hammer and Champy 1993; Keen 1997; Kaplan and Norton 1999). These kept the tread mill of capitalism, industrialization, materialism, consumerism and profiteering on a faster track by sucking in giga-order planet's non-renewable resources and generating tera-order debris and harmful wastages, while limiting and constraining the revival

capacity against environmental evils and questioning the sustainability capability of the planet. One can appreciate the level of externalities or devastation for both the civilization and planet per se.

Due to interactions of multiple variables, environment on the mother planet earth possesses higher level of inertia on the one hand and being inanimate in nature on the other cannot express its damages on related scale and scope instantaneously. For example, the effects of emissions of green house gases in the form of water pollution, acid rain, air pollution, ozone layer depletion, global warming, depletion of arctic and land ice and corresponding rise in sea level, desertification, soil degradation, deforestation, space requirement for land-filling and energy needs for recycling and genetic modification are visible only after a rise in their threshold level in terms of human visibility and sensing capability only with elapse of centuries. The process of industrialization kept on polluting the environment for past two and half centuries till 1960s, when some signs of these evils started signaling to human beings, by this time human being got habituated with emerged newer lifestyle and consumption pattern and quantum. These were consequences on physical side of environment still there are some non-physical and invisible issues like social and economic inequalities, poverty, hunger and malnutrition, deterioration in human immune systems, sanitation problems, unemployment, crime and deviance, war and terrorism, and disintegration of family. All these episodes were created and accelerated by human beings for roughly three centuries with the aim of material benefits, so called economic growth and development through the process of industrialization. Despite, some of the highly industrialized states, who remained on forefront for and were one of the main responsible creators (Table 6) of above mentioned damages refused to take corrective action even after 2001 with multiple calls from global societies on the excuse of damage of its economy (Giddens 2009:184). Ultimately, current civilization has to take its inventories of activities and arrive at a bold decision, whether it wants to continue with perpetual existence or close the chapter of human civilization in the race of consumerism, materialism, industrialization and globalization in the name of economic growth and development by the end of current century. The real issue is not of economic growth and development versus environmental externalities, but it is sustainability of climate and environment for perpetual existence of civilization versus economic growth in the name of current material benefits, undesirable choices and pseudo pleasure.

Objective, Rationale, Research Approach and Data Gathering

Thus, one gets some feel for mega scale development in terms of choices and luxuries availability on one hand and constraints on civilization and planet earth on the other. Meaning, can current civilization get continuous support from mother planet earth at this level of social consumption? Hence, motivation and rationale remain to understand the relative significance of growth and developments with heavy concentration of scientific and technological development, and their major incorporation into life-style on one side, versus, distinct challenges posed in terms of poverty, inequality, social and family tensions versus fear of survival and sustainability on the other. To appreciate the process, one is doing some kind of exploration through case based approaches to the emergence of some pattern through analytic generalization rather than statistical one. While continuing on the task, tracing and using the data like, wastages and debris along with mining, manufacturing and environmental statistics for mother planet earth, press releases, other researchers' work and participant's observation seems quite interesting.

Industrialization Process

Adjoining diagrams in Figures 1 and 2 present the intricacies of modern industrialization processes based on input, throughput (process), output, purpose, utilities and facilitation parameters.

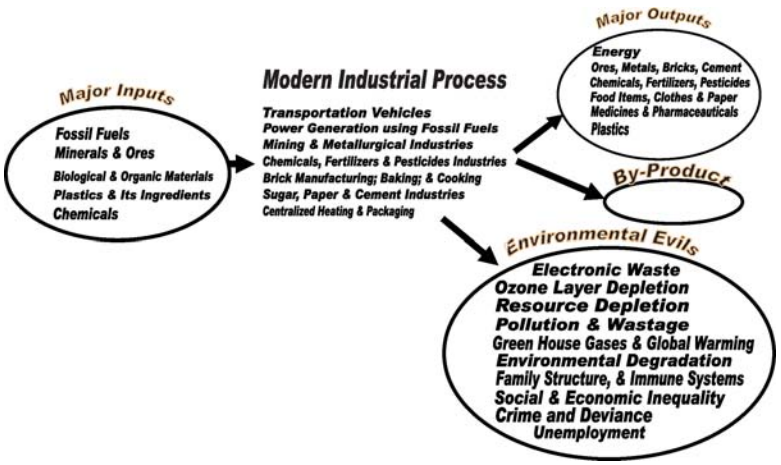


Figure 1: Modern Industrialization Process

Source: Author's Sketch and View for Illustration only- Giddens (2009)

Industrialization process has produced three kinds of outputs, viz. desired and intended outputs consisting products like energy, ores, coal, oil and petroleum products, bricks, cement, chemicals, fertilizers, pesticides, plastics, food and beverages, clothes, houses, medicines and pharmaceuticals, paper, automobiles, aircraft, other consumer durables, luxuries and lots of services along with some by-product having some utilities on one hand, and huge undesired and unintended externalities called wastes forming environmental evils like emission of greenhouse gases inducing ozone layer depletion, global warming, acid rain, and air pollution, water pollution, depletion of non-renewable resources, and generation of huge debris and wastages (Table 1), which are difficult to be processed and recycled causing non-recoverable environmental degradation in the form of soil erosion and degradation, deforestation and desertification, land occupation, health hazards on the other.



Figure 2: Need-Product Facilitation Process

Source: Author's Sketch and View - Buffa (1976); Martinich (1997); Schroeder (2007); UNDP (2014)

Table 1: Type of Wastes and Related Handling Methods

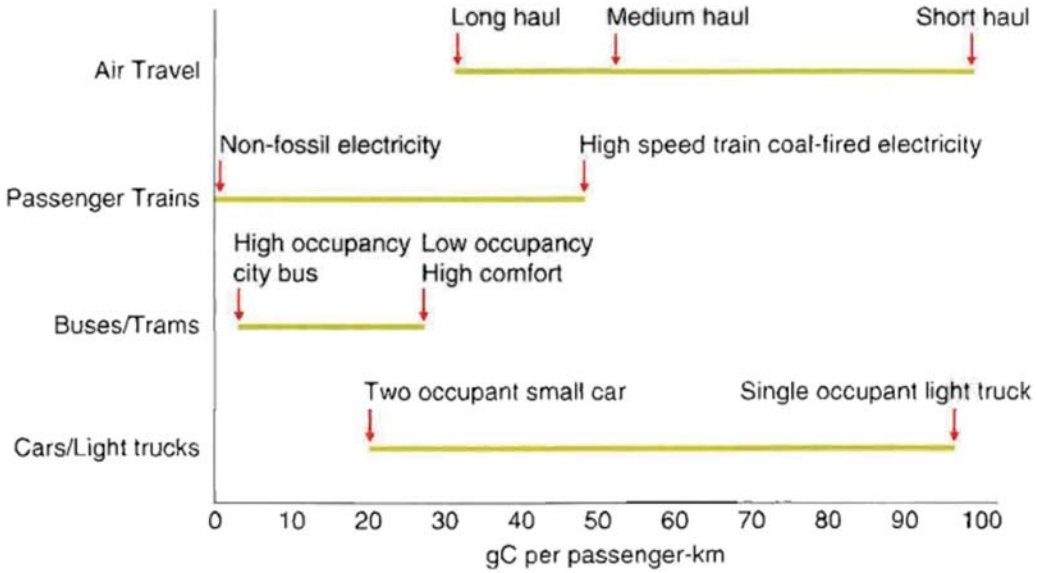
Waste Types	*Examples*	*Disposal Methods*	*Problems*
Solid	Mining Debris, Metallurgical Solid Wastes, Power Plant Solid Wastes, Construction & Demolition Wastes	Land Filling	Space Constraints, Leaking and sipping into water table – Water Pollution
	Manufacturing Wastes – Metallic – Non-metallic Hazardous & Electronic Wastes	Recycling, Land Filling, Extraction of Rare Metals & Land Filling/Incineration	Energy & Cost Constraints, Space Constraints, Leaking and sipping into water table – Water Pollution, Hazardous to Human-beings
	Plastics, Packaging Materials, Municipal Solid Wastes, Food Wastes	Land Filling, Incineration, Recycling	Air Pollution, Ozone Layer Depletion, Global Warming, Energy & Cost Constraints
	Agricultural Wastes, Pastoral Wastes, Wood Wastes, Leather Wastes, Yard Wastes	Land Filling, Burning, Incineration, Recycling, Discharge into river	Air Pollution, Ozone Layer Depletion, Global Warming, Energy & Cost Constraints, River Pollution
Liquid	Dies, Insecticides, Hazardous Chemicals	Discharge below water table through deep-well, Discharge into river	Energy & Cost Constraints, Land Infertility, River Pollution
Gas	Transport Operation (Figure 3), Consumer Durables (AC, Freeze), Power Generation, Metallurgical Processes, Mining Activities	Discharge into atmosphere	Air Pollution, Ozone Layer Depletion, Global Warming
Nuclear Waste	Nuclear Vessels & Equipments, Nuclear Fuels (Waste), Water and Associated Liquids	Dumping after Packaging	Radioactive and takes very long life for decaying

Source: Author's Conceptualization with Data from various United Nations Reports

Major Concerns

Let us focus our attention on historical emergence of environmental issues – major difficulties imposed on civilization due to gradual intensification in industrialization process for past three centuries. Current industrialization process emerged with the use of inanimate power by development of steam engine and its commercialization since 1715 and got intensified after 1825, when invention and commercial application of electric motor appeared. Efficiency requirements of industrialization process demanded and got facilitated by city and urbanization (Giddens 2009), educational and training of manpower (Weber 1950) and separation of workplace from residence (Giddens 2009), inviting duplication of space, utilities and sanitary facilities coupled with mega scale personalized transport requirements. Repercussion of transportation is presented through Figure 3. In twentieth century, electrical and electronics innovation picked up its momentum and started complementing the plain mechanical and thermal power, and accelerated the consumption of latter on gigantic scale. By later half of previous century, innovation got focused on data processing and communication mechanism, which led to

convergence of electronics, computing, information technology and communication. In this process, value addition and value capture activities got highly mechanized, automated and routed through heavy use of information and communication technology (ICT), which invited and facilitated feminization of work place. In this dynamics of mega scale industrialization and modernization, gigantic order material consumption emerged not only at users' end but also at process level - leading to huge demand on materials like various metals and their substitutes such as plastics and fibers along with heavy consumption of energy and its resources in routine life style of human beings. To support the material conversion process from ores to respective metals as well as that from petroleum products (Figure 4) to plastics were facilitated and energized by fossil fuels. Additionally, non-metallic materials and related manufacturing activities like brick making, cement production, toilet facilities (seats, wash basin, tiles making, rubber, chemicals), tubes, tires, ships, aircraft, transport vehicles, sugar and food processing industries started sucking fossil fuel or woods on mega scale. On the similar front even energy requirements for transportation (Figure 3), air-conditioning, centralized heating of houses, running of industrial motors and automation facilities, energizing and mechanization of house hold activities, multiplexes, stadiums, educational and ICT facilities, and so on, were huge and demand on fossil fuels or nuclear fuel got highly intensified on giga-scale. Rather any activities using inanimate power suck either fossil fuels or nuclear fuel. Physicists and engineers are suggesting that the efficiency and effectiveness of fossil and nuclear fuels for above mentioned activities remains around 40% to 50%. Thus, mega scale suction of fossil fuel generates more than 20-to-50 fold mega level order of debris, wastes and green house gases (Figures 4, 5 and 6, and Tables 1, 2 and 3) including sulphur dioxide, mainly responsible for air and water pollution, and also the acid rain creating phenomenon like soil erosion, global warming and rise in sea level during its process of mining, extraction and refining (Figures 4, 5 and 6, and Tables 1, 2 and 3). This has not happened for few years or for few decades, but it continued on exponential growth path for past three centuries.



European carbon emissions (grams of carbon per kilometer) by mode of transport, 2007
Source: ATAG http://atag.org/flles/PR%20LON-170002A.pdf (Slide 6, accessed 18 January 2008)

Figure 3: Carbon Emissions by Mode of Transport 2007
(Source: Giddens 2009:163): ATAG (Air Transport Action Group)

One episode of generation of green house gases and level of air pollution is depicted in figure 3, whereby one can get a feel of quantum of green house gas emitted during transportation process using different modes. In 2013, air aviation sector consumed 1.5 billion barrels of jet A-1 fuel, generated 745 million tons of carbon dioxide, which is roughly 2% of total human production of 36 billion tons of carbon dioxide emissions (ATAG 2016) while accomplishing our will of flying like bird and concurring time. Aviation sector is responsible for 12% of emissions of transportation sector, while road transport responsibility remains at 74% level. As per ICAO (International Civil Aviation Organization), specialized agency of United Nations, aviation industry has to come up with newer design of jet aircraft with half the level of emission, which was faced in 2005. Meanwhile, they have to cut 1.5% of emissions annually till 2020 (ATAG 2016). Similar level of concern is visible for road transport emissions from different authorities with some positive sign of results. However, volume of growth in consumption worsens the scene.

Table 2: Environmental Externalities during Industrialization and its Mass-scale Commercialization

Dimensions	*Processing Issues*	*Effects*	*Indirect Effects*
Mass Production	Mass Consumption ↑	Mass Purchasing Power ↑ (Demand)	Imitation ↑ (Consumption Habit)
Material usage	Metals (extraction) ↑ Mining ↑ Electrical Energy ↑	Green house gases – Emission ↑ Usage – Recycling ↑	Global Warming ↑ Sea Level ↑
	Plastics ↑ Non-Metal Production ↑ Chemicals & Pharmaceuticals ↑	Green house gases – Emission ↑ Usage – Recycling ↓	Acid Rain ↑ Wastage ↑
Mechanization	Automation ↑ Deskilling ↑	Quality ↑ Cost ↓ Uniformity ↑	Customization ↓
	Manpower ↓	Unemployment ↑ Purchasing Power ↓ Poverty ↑ Inequality ↑ Hunger ↑ Malnutrition ↑ Crime & Deviance ↑	Social Tension ↑ Social Cohesiveness ↓ Feminization ↑
Automation, Display & User-Interface by Electronics	Silicon/Germanium Chips ↑ Plastics ↑ Mercurry ↑ Batteries ↑ Cadmium ↑ Nickel ↑ Molibdenum ↑	Technological Pilferage ↑ Recycling Hazardous ↑ Incineration/Land Filling (Poisionous) ↑	Health Hazardous ↑ Human Organ Disabler ↑
Customization	Skilled & Smi-skilled Manpower ↑	Employment ↑	Skilling Process ↑
Packaging	Wastages – Materials ↑ (disposal) – Energy ↑	Recycling ↑ Release of Methane ↑ Consumption of Fossil Fuels ↑	Air & Water Pollution ↑ Dumping ↑
Feminization (Work)	Redistribution of household efforts	Inequality ↑ Family disintegration ↑	Social & Family Tension ↑
Garments & Consumer durables	Fashion (Possessing versus Utility)	Throwing away – Wastages ↑	Trigger (Mega-Consumption) ↑
Urbanization	Sanitation ↑ Inner city problems ↑	Wastage handling ↑ Crime & Deviance ↑	Emotion ↓ Market Mechanism ↑
Waste & Debris Generation	Land Filling ↑ Recycling ↑ Hazard Disposal ↑	Quantum & Order ↑	Air & Water Pollution ↑
Globalization	Cultural attack ↑	Western attack – on all culture ↑	Social Confusion ↑ (local versus western)
Dependence on Agriculture	Industrialized: 0.7% – 4.6% Mental Stress ↑	Developing (Rwanda, Uganda, Ethiopia, Nepal, Bangla Desh): 63% – 90%	Physical Effort Focus ↑ Immune Systems ↓

Source: Author's Conceptualization and view (inputs from sources like United Nations, NASA, World Bank sites)

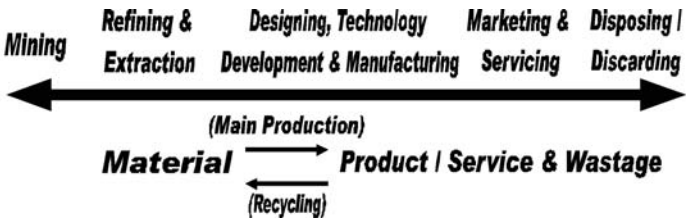


Figure 4: Production and Facilitation Process (Forward and Recycling)

Source: Author's Skech and View Including Proter (1985); Martinich (1997); Schroeder (2007)

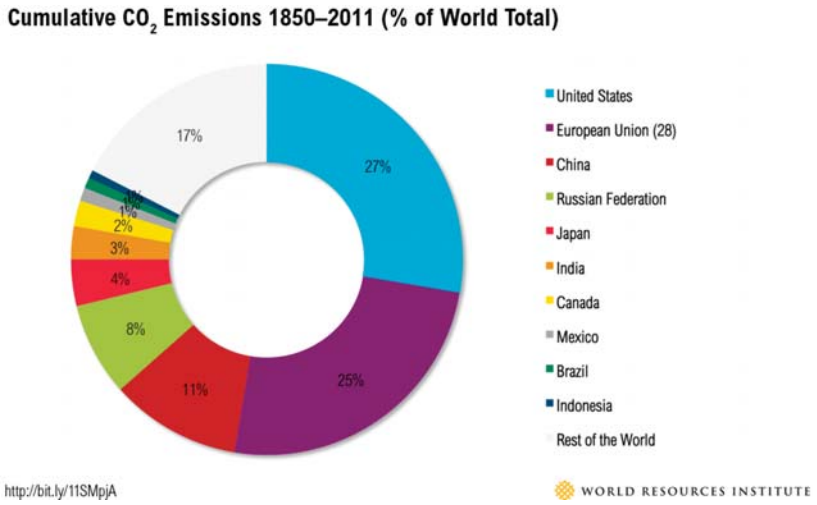


Figure 5: World's Cumulate Emissions (Carbon Dioxide) 1850-2011 (http://www.wri.org/comment/2150#comment-2150)

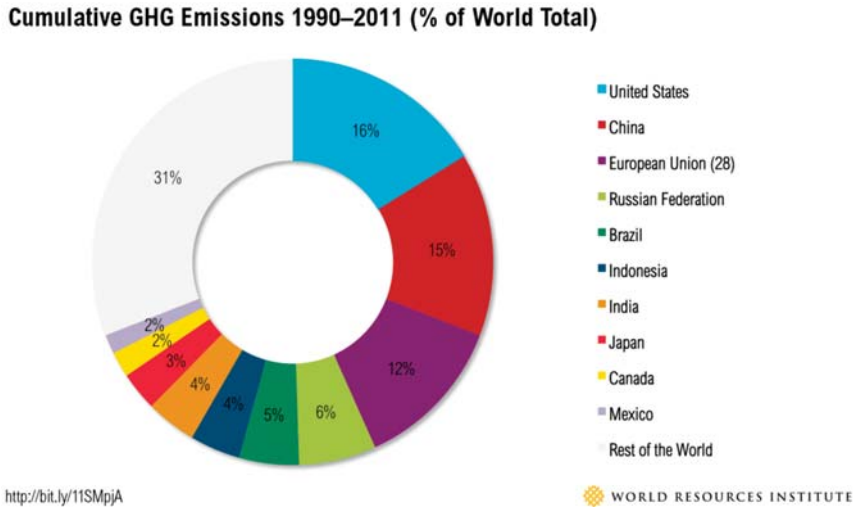


Figure 6: World's Cumulate Emissions (Green House Gases) 1990-2011

(Source: http://www.wri.org/comment/2150#comment-2150)

Table 3: Environmental Variables/Data (Source: NASA/GISS – 29 Feb. 2016: 14:00 IST)

Dimensions	*Change*	*Rise/Fall*	*Since*	*Long Term Effects*
Carbon Dioxide	402.26 ppm	↑	650,000Years (Highest)	Global Warming↑ Rise in Sea Level↑ Ocean Acidification↑
Global Temperature	1.4 Deg. Fahrenheit	↑	1880	rise of 2.5 to 10 degrees Fahrenheit over next century
Arctic Ice Minimum	13.4% per Decade	↓	Lowest in 2012	essentially ice free in summer before mid-century
Land Ice	287 billion tons per year	↓	Greenland Ice Loss doubled between 1996 & 2005	Greenland lost 150 to 250 cubic kilometers (36 to 60 cubic miles) of ice per year between 2002 and 2006 Antarctica lost about 152 cubic kilometers (36 cubic miles) of ice between 2002 and 2005.
Sea Level	3.41 mm per year	↑	7" up in 100 Years	Sea level will rise 14 feet by 2100
Precipitation/Rain	Land Surface: 22% ofTotal		Sea/Ocean: 78%	Storm increases the scope for higher level of precipitation on land due to movements of clouds – adverse effect may occur
Solar Energy absorbed by earth surface	48% (Both Land & Ocean)			

Above mentioned level of emissions of green house gases has created high level of air pollution, which has resulted into global warming with a rise of temperature of 0.8 degree Celsius since 1880 and highest level of carbon dioxide 402.26 ppm (highest in 650,000 years), resulting into rise of sea level by 7 inches in 100 years and acidification of upper layer of ocean mainly due to absorption of 2 billion tons of carbon dioxide per year, creating difficulty on lives of many marine species and changing the bio-diversity (Table 2). It is also causing loss in arctic and land ice, which will lead to 1 to 4 feet further rise in sea level with an additional rise of 1.4 to 5.5 degree Celsius by 2100.

Table 4 presents some of unique dimensions of water problem like contamination, especially during the process of production of fossil fuels, followed by level of consumption during industrial production versus that during energy production (main cycle as well as cooling purposes) another scope for adulteration. Additionally, it also presents the energy requirements for treating the water for safe human consumption from various sources. What is more significant that diseases like diarrhea and cholera are mainly caused due to adulteration or contamination of water and is quite prevalent in developing countries, where availability of portable water is more costly and difficult, especially for people surviving on less than $2 per day. This kind of diseases claims millions of lives per year from developing countries and is more vulnerable to children. Water pollution is more prevalent once industries discharge their untreated liquid waste or other kind of waste into rivers and lakes; sometimes they discharge their liquid waste into underground water table without any knowledge of governing authorities, which is even more dangerous.

As we have seen through previous paragraphs and Table 1, the quantum of wastages produced during metal and non-metal extraction, manufacturing, technological facilitation using electronics, electronic waste disposal (Box 1), packaging and service industry remains of very tall order and of all possible combinations of hazardous - non-hazardous, voluminous - less voluminous, bio-degradable and bio-non-degradable, and hence waste disposal system of this tall order (Table 5) remains a major challenge for responsible authorities. For example, referring Figure 4, four tons of bauxite ore is required to get one ton of alumina from which aluminum is produced through the use of electrical energy, again claiming higher level of energy, where efficiency remains around 40% claiming fossil fuel and generating wastage and greenhouse gases. Further rolling of aluminum ingots to make structural material or foil or electrical items will require further processing, claiming additional electrical energy. Additionally, to get 4 tons of bauxite ore, one need to get around 12 tons of debris from related mines. Hence, one is able to notice that to get one ton of aluminum, two tons of alumina, eight tons of bauxite ore and 20 tons of

Table 4: Water Related Data (http://unesdoc.unesco.org/images/0022/002269/226961E.pdf 15 Mar 2016)

Dimensions	*Volume*	*Reason*
Contamination	15–18 billion m^3 of freshwater resources	– contaminated by fossil fuel production annually
Industrial Consumption	777 billion m^3	(20% of world's total withdrawals)
Energy production	583 billion m^3	(15% of world's total withdrawals) (90% power generation – water intensive)
Energy production (Europe)		(43% of its total withdrawals)
Energy production (USA)		(50% of its total withdrawals) > That for agriculture
Energy production Cooling (China)	100 billion m^3 annually	More than 10% of the national cap (700 billion m^3) (Bloomberg, 2013)
Water Treatment Needs		
Lake or river	0.37 kWh/ m^3	Amount of energy requi red to provide 1 m^3 water safe for human consumption from various water sources
Groundwater	0.48 kWh/ m^3	
Wastewater treatment	0.62–0.87 kWh/ m^3	
Wastewater reuse	1.0–2.5 kWh/ m^3	
Seawater	2.58–8.5 kWh/ m^3	

debris (including that during mining) are required. According to EPA, "release of perfluorocarbons during the aluminum smelting process are 9,200 times more harmful than carbon dioxide in terms of their affect on global warming" (Leigh 2010). Similarly, on power requirement side, one can estimate the debris produced and greenhouse gases emitted. Let us get a feel for value addition process for consumer goods. On the one hand, industries engaged in value generation, value capture and value delivery activities suck major resources like fossil fuels, capital, land, labor, motivation, emotional and social feelings, and very little is left for waste handling purpose, however, it seems that requirements for these activities remains diverse and of tall and mega order (Box 2 and Table 5). Challenge is on both the front of market mechanism and administrative one during the process of handling wastes as well as that during generation of mega order and fixing up of responsibility and accountability for these. Society and economy is engaged in enjoying the benefits of modernity and industrialization, who is bothered about mega level excretions and toiletry activities of modernity (Box 1 and 2). Merely left with municipal and local authorities with meager resources and motivation, they handle it in their own way, example remains US handling its electronic wastes through Chinese Guiyu with huge health hazards for persons involved in processing (Box 1; Figure 7). Important approaches followed are recycling and land filling, and both involve its own kind of complexity and have to face different kinds of vagaries. Let us visualize three distinct types of process – like land filling, disposal of hazardous materials and that of recyclable ones.

Box 1: Quick Facts about E-Wastes (Worldwide Generation versus Dumping into Guiyu, China)

- 40-50 million metric tons of e-waste are generated worldwide every year. This is the equivalent to a pile of e-waste eight times that of the Great Pyramid.[1]
- In a year, the average American produces 48 pounds of e-waste, which is five times as much as the average Chinese citizen.[1]
- E-waste represents 2% of America's trash in landfills, but contributes 70% of overall toxic waste.[2]
- A large portion of what is labeled as "e-waste" is actually not waste at all, but rather electronic equipment or parts that can be reused or recycled.
- The average Fortune 500 company provides 3-4 electronic devices to each employee.[3]

E-waste is short for electronic waste - the stream of discarded consumer electronics and electronic equipment that have outlived their usefulness. Common products include computers, televisions, VCRs, stereos, toys, copiers, fax machines, laptops, and phones. The vast majority of e-waste can be reused, refurbished, scrapped for parts, or recycled. However, in the US, only 20% of Americans properly dispose of their e-waste, and only a fraction of that 20% that is properly disposed of is recycled or reused within the US.5 Ideally, proper disposal of e-waste would take place in factories where recycling is undertaken by machines with proper environmental regulations and procedures to protect workers and the local environment from exposure to harmful materials and pollutants. Often, however, that isn't the case.

The environmental damage in Guiyu is grave. Residents exhibit digestive, neurological, respiratory, and bone issues and diseases. Children in Guiyu are at a higher risk of lead poisoning and 80% of children experience respiratory ailments. In a 2007 study, 82% of the children in Guiyu had blood lead levels exceeding 10 µg/dL. In the village of Dutou, every child tested was lead poisoned.

(Source: http://batteriesandsustainability.org/chapters/ewaste.html – 08 October 2017: 15:00 IST)

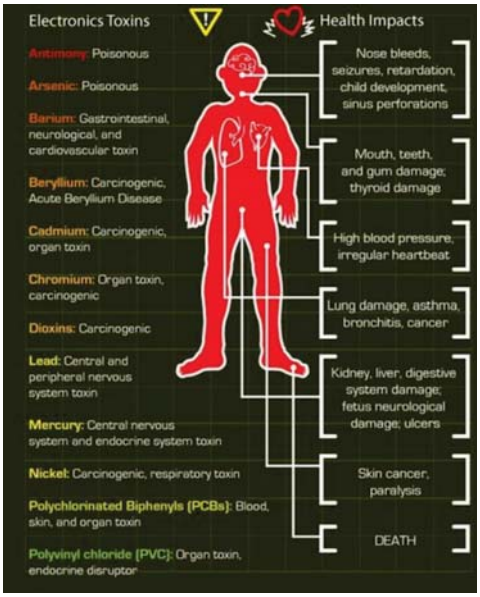


Figure 7: Effect of Disposal of Electronic Wastes on Human Health

(Source: http://batteriesandsustainability.org/chapters/ewaste.html–accessed on 08 October 2017:15:00 IST)

Table 5: Level of Waste Generation versus Recycling and Resources/Funds Needs

Consumption / Generation versus Society	***Quantum of Resources/ Wastes/Money***	***Data Source***
Wealthiest 20% People	Consume **75%** of Planet's Resources	World Bank
Recycling of Municipal Solid Waste (MSW)	**3.5** fold	UNEP
Current Municipal Solid Waste (MSW)	**1.3** Billion tons	
Projected Municipal Solid Waste (MSW) for 2025	**2.2** Billion tons	
Land Resource Requirement per Person	**1.8** Hectares	
Continuation of Urbanization of World Waste (Projected)	**70%** Increase in Urban Solid	World Bank
Global Market for Waste Management (Collection and Recycling)	**US $ 400 Billion**	UNEP
Global Market for Scrap Metal and Paper	**US $ 30 Billion**	World Bank
Textiles thrown away by United Kingdom	**2 Million tons** Every Year	
Textiles Recycling by United Kingdom	**24%**	
Use of waste textiles to make new items	**10%**	DEFRA
Buildings' Consumption of Energy by European Union	**40%**	Sustainable Energy for all (se4all.org) & World Bank
Iceland's Consumption of Energy (100% from Renewable Sources)	**13%** from Geothermal **87%** from Hydropower	
Brazil's Energizing	**83%** Hydroelectric Power	

(Source: UNDP (2014) Southern Innovator: Waste & Recycling Issue, Issue 5, United Nations Development Program)

Box 2: China's and Indonesia's Emissions

China's emissions are not link *by* Kate Kemp on Sep 14, 2015 (http://www.wri.org/comment/2150#comment-2150)

China's emissions are not only from global consumerism but the business opportunities embraced by China, from western countries ordering components for Solar Energy panels and wind turbines, trying to lower their emissions!!! For instance, in the UK, re-cycling targets are set by the EU and heavy multi-million fines by the EU if we don't meet those targets. But, re-cycling plants are closing down because globally, the prices per tonne of plastic/paper / tin has dropped significantly. So, NOW, our recyclable waste is sold cheap by local UK Councils, to re-cycling plants in Indonesia and gets loaded onto enormous container ships, going 9,400 nautical miles, JUST to avoid EU fines!

Basically, the west and their 'first world' countries, are giving contracts to China for solar Panels and wind turbines, to visibly reduce THEIR global pollution and emissions and LOOK as if they are playing their part. It's such HYPOCRISY by western countries. China and Indonesia are vilified for being top global polluters, at the expense of Western countries appearing to comply and look good. No-one talks about the inefficiencies of wind turbines, using electricity to keep the damn things turning in zero wind and them completely falling apart in high winds, even falling over. UK Conservative Government said they would be the greenest government and then stopped 'Free solar panels on private homes' ... much to the upset of Solar Panel installers, who were making a fortune, importing solar panels from China!

The links mentioned below, are just an offering, from left and right wing newspapers who sometimes do decent journalism regardless of politics.

http://www.bbc.co.uk/news/magazine-21432226

http://www.telegraph.co.uk/finance/newsbysector/transport/10289821/Conta...

http://www.cifor.org/publications/pdf_files/research/governance/XSunetal...

http://www.dailymail.co.uk/home/moslive/article-1350811/In-China-true-co...

http://www.dailymail.co.uk/news/article-1241872/EXCLUSIVE-Inside-Chinas-...

http://www.dailymail.co.uk/news/article-2362762/The-dirty-secret-Britain...

http://www.theguardian.com/environment/2012/aug/07/china-rare-earth-vill...

- **REPLY**

Cannot agree more!! Most link *by* Anonymous **on Nov 16, 2015**

Cannot agree more!! Most people totally ignore that one of the biggest parts in Chinese economy belongs to export, which means some developed countries actually need to seriously consider their way of living, and develop more ecological consumer culture.

The large volume of debris both bio-degradable and bio-non-degradable is mostly thrown into land filling either because of lack of resources, attention and inclination for recycling, or because of ease or a combination of all these. It involves market mechanism and administrative process for grabbing the land site on one hand and disposal of bio-degradable material in land filling – generates methane, a type of green house gas, further adding into air pollution cycle, generally not in direct notice of society on the other. Second type of disposal of hazardous materials – a

case on disposal of radioactive material, cobalt-60 from one of the Chemistry laboratory of University of Delhi (in March 2010), claimed the life of one person of contractor and severely handicapped around 8 people from Mayapuri area of Delhi (Singh et al 2013). Though law enforcing agencies came into picture, one needs to understand and appreciate the role played by Delhi University in terms of – whose fault, whose responsibility and whose accountability. However, initiator remained one of the apex institutions like Delhi University, not able to appreciate the need of waste disposal for hazardous material in society, who else should be held responsible to usher in society for this role. Can Delhi University be freed from this type of accountability, a mere negligence on one hand and ushering in and inculcation of such practices in society on the other? Let us focus our attention on the third type namely recyclable waste disposal through the episode of UK, as detailed in Box 2. Market for tin, plastics and some other ingredients has become cheaper and hence recycling of these wastes is no longer attractive for western world. For example, non-compliance of recycling standards, EU used to put huge penalty on its member countries (UK in this case). Accordingly, UK authorities are passing the responsibility of recyclable waste disposal on distant processor from Indonesia, forcing consumption of fossil fuel in transportation of voluminous waste through containers for 9,400 nautical miles, inducing further generation of green house gases just to avoid EU fines – either due to cost of processing in UK could be high or might not be interested in handling such kind of wastes, which were created by their society or to look good, while reducing their level of pollution. One can get a feel for mega order generation of wastes and corresponding disposal mechanism – how will it be handled, either market mechanism or hierarchies or on God's grace? One can get another feel for economic development versus environmental externalities.

On one hand, developed world is demonstrating their requirements for heating their homes, moving on luxurious vehicles and enjoying affluent life style, while sucking the earth's resources and polluting the environment at the order of 486 times (Menzel & D'Alusio 2005) not only for its necessities but also for luxuries (Tables 6 and 7), on the other roughly 800 million people are starving and live without 2 courses of meal every day, children face malnourishment with high mortality rates. Table 6 presents the level of consumption for USA having five percent population of the world and correspondingly 40 percent of garbage generation of the world demanding 4.1 numbers of earths (Table 7) for survival, if everybody starts consuming as US citizen does. It gets further worsened if consumption pattern is that of citizens of UAE (Table 7). Similarly, Table 5 presents level of garbage and waste generation in the new urban world and its demand for resources and funds for disposal, accordingly two million tons of textiles are thrown away every year, however poor lacks for this kind of cloths.

Table 6: Population and Consumption Level Data for USA

Items	***Portion of the World***
Population	**5%**
Energy Consumption	**20%**
Meat Consumption	**15%**
Garbage Generation	**40%**

(Source: UNDP (2014) Southern Innovator: Waste & Recycling Issue, Issue 5, United Nations Development Program)

Table 7: Level of Consumption versus Number of Earth Requirements

Consumption in Society	***Number of Earth Requirement***
UAE	**5.4**
USA	**4.1**
France	**2.5**
Costa Rica	**1.4**
China	**1.1**

(Source: UNDP (2014) Southern Innovator: Waste & Recycling Issue, Issue 5, United Nations Development Program)

Considering the significance of Figure 4, one gets a feel for the level of waste generated during the process of production and facilitation process (forward and recycling) both for product manufacturing and related technology development, and the same is presented through diagram of Figure 8 for European Union (EU-28) for 2012. Levels in pie-chart vary from countries to countries depending upon relative emphasis on economic activities and also with respect to time frame. For EU-28, mining and construction activities generate more than 60% of wastage (Figure 8).

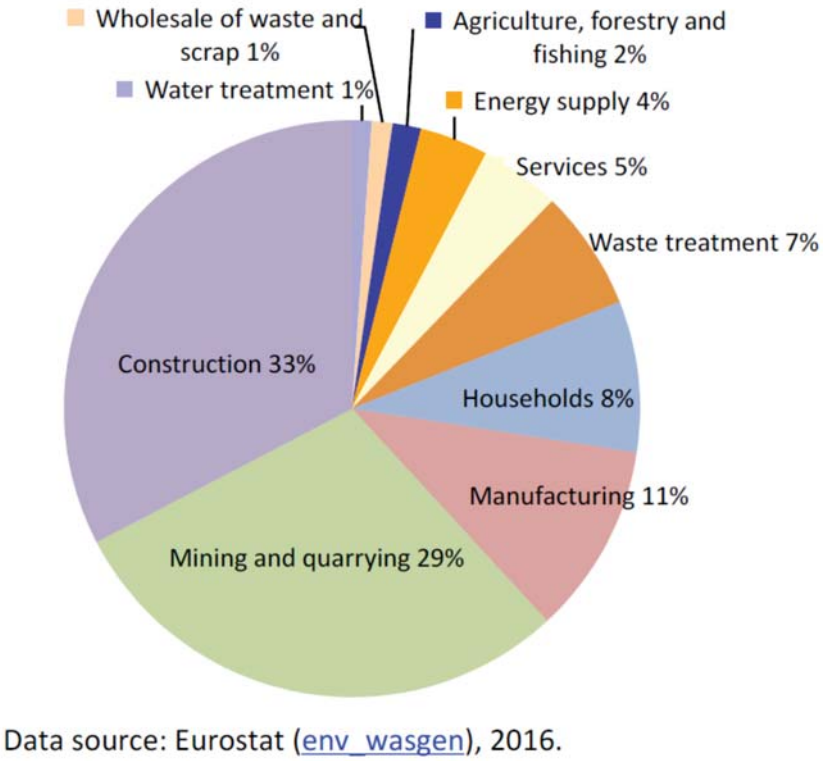


Figure 8: Waste Generation in EU-28 by Sector (2012)

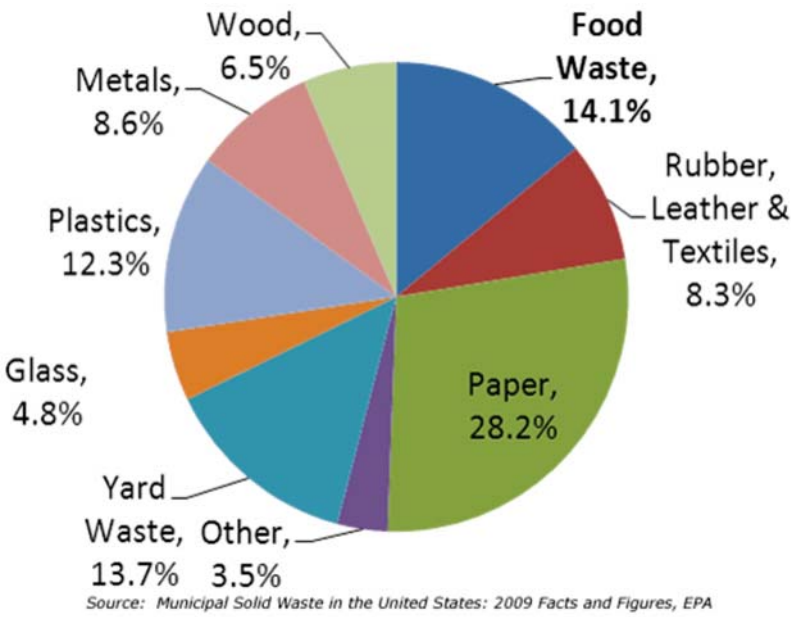


Figure 9: United States 2009 Total Municipal Solid Waste Generation by Material before Recycling, EPA

Similarly, Figures 2 and 11 present the levels of different types of wastes during need-product facilitation process and product life span (technology versus economics) related activities as pie-chart and bar diagram sketched in Figures 9 and 10 USA for 2009. Significant point remains quantum of food waste going into landfill versus level of hunger on the planet versus emission of greenhouse gases through this process.

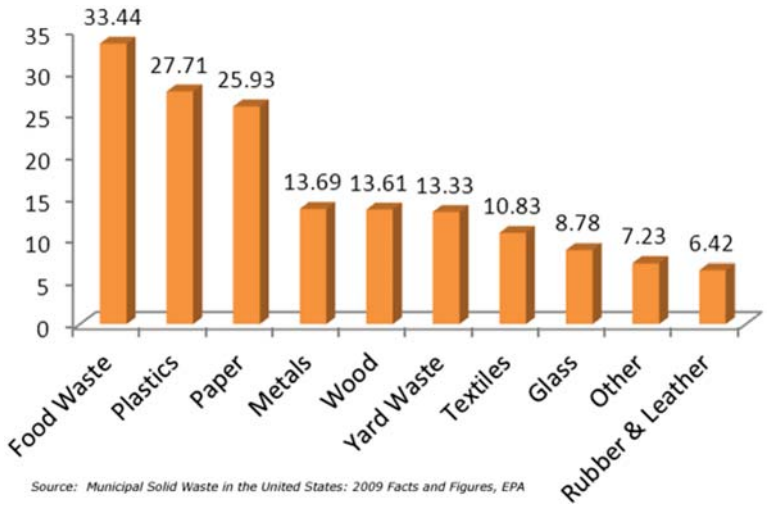


Figure 10: United States 2009 Municipal Solid Waste Discarded in Landfill (in 1000 of tons)

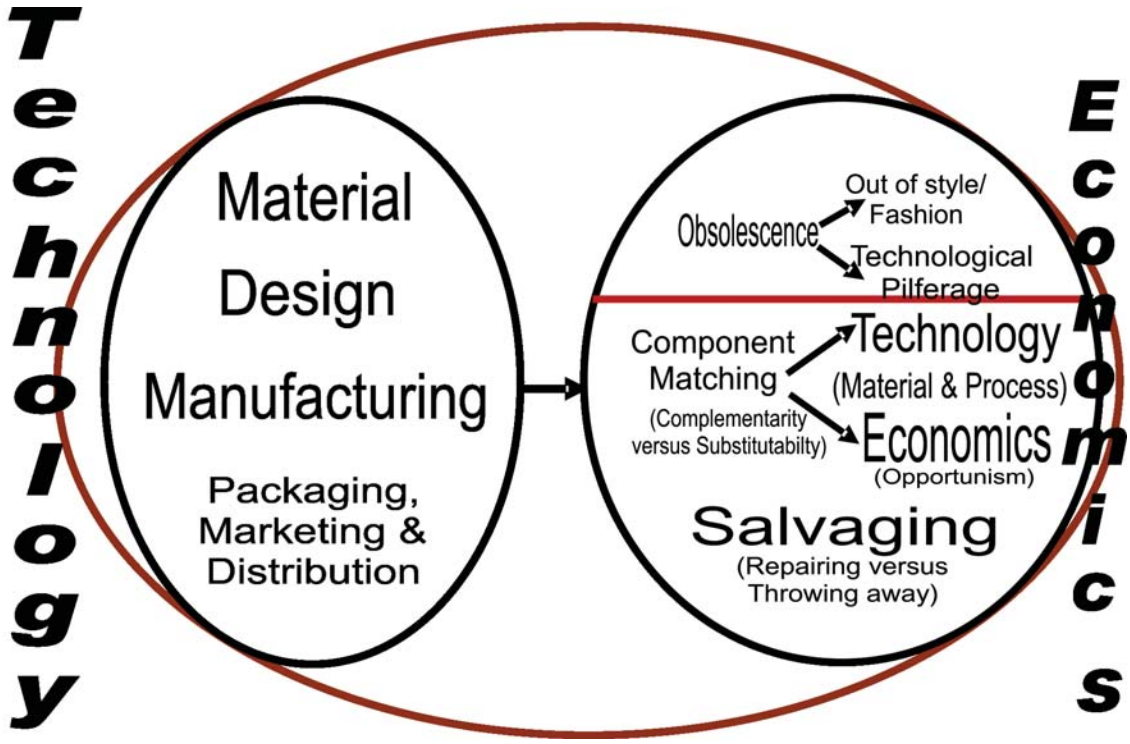


Figure 11: Product Life Span (Technology versus Economics)
Source:Author's Sketch and View (Economics and Manufacturing) - Buffa (1976); Martinich (1997); Schroeder (2007)

Let us get a feel for various ways of disposing the wastes. These could be through reusing, recycling, composting, land filling and incineration. Intricacies of land filling remain with acquisition of land, preparing the same and finally filling it appropriately. Each will have its own kind of complexities and costs and some of them are documented earlier. Incineration releases some energy and power can be generated, however level of carbon dioxide and other greenhouse gases (GHG) emerge and air pollution results in the process. Composting looks to be one meaningful option, whereby bio-degradable wastes are converted into organic fertilizer. Can this method be used for sanitary diapers? If one explores the possibilities, unique process of disposing of diapers seems to be composting by tearing and separating the biodegradable portion from leak-proof portion and putting the former with composting material in the pit. Here, significant consideration remains that how many of diaper users will be having willingness to do this, especially when toilet cleaning is done by mid-servant only. Thus, consumerism, comfort and lifestyle facilitated with sanitary diaper but could not suggest effective method for its disposal and eventually land up through land filling and posing the difficulty of GHG like methane emissions.



Figure 12: Business Positioning by Entrepreneur

Source: Author's Sketch and View based on Economics and Strategy including Koutsoyiannis (1979); Peteraf (1993); Amit and Schoemaker (1993); Martinich (1997); Schroeder (2007)

Analytical Framework in Consumption and Waste Generation

Referring Figure 4, one can expect wastages at each stage of mining; refining and extraction; designing of product versus design, development and facilitation of technology, and manufacturing; marketing and servicing; and finally disposing the product (for example, electronic-waste disposal at Guiyu, China by USA; Box 1, Figure 7). This has been explained by production of aluminum foil from bauxite ore lying in bauxite mines. Figure 2 suggests wastages in terms of debris, garbage, wastage during trimming or emergence of useless materials in conversion process, rejection due to poor quality of output, out of fashion, and nice to possess – leading to obsolescence and pilferage. However, sketch of Figure 11 clarifies the role of technology versus that of economics on three distinct dimensions such as obsolescence, component matching and salvaging. For example, obsolescence can happen due to faster rate of technological innovation (as in electronic, telecommunication and IT industry), which yields quantum jump in terms of benefits or due to socioeconomics and product getting out of fashion. At the next level of component matching, the role of technology versus that of economics gets complicated due to complementarity (Amit and Schoemaker 1993; Peteraf 1993; Milgrom and Roberts 1995) versus substitutability (Amit and Schoemaker 1993; Peteraf 1993) nature of components with respect to other components or that with the whole product per se in terms of material, composition, strength, cost, size, shape and utilities. Here, technology tries to bring parallelism in life-span and synergy among these components or with the product itself, however, economics may bring opportunism and product may malfunction after sometime due to poor mismatch among or ill-intended match of components in terms of material, composition, strength cost,

and hence needs replacement either of components or of product itself (for example, design and assembling of shoe upper with its sole in manufacturing of footwear). Opportunism (Williamson 1993) disturbs the balances of complementarity versus substitutability among components and their fitness (Milgrom and Roberts 1995; Porter 1996) with the product due to ill or profiteering attitude applied through economics. At the third level, salvaging the product can be executed by either throwing away or discarding its usage even though it may be functioning with reasonable level of utility or by deferring the salvaging process by repairing the product.

The central question remains, why does an entrepreneur behave like an opportunist to persuade the consumers either to salvage the product once its functionality is still available or design the product with components not having proper fit among them (Milgrom and Roberts 1995; Porter 1996) in terms of strength, composition, life span with lack of perfect technological complementarities? Answer to this question may yield us the reason for quantum, scale and scope of waste generation by business, especially for the case of electronic waste disposal by USA as noticed through Box 1 and Figure 7, and textile waste by UK spelt in Table 5. Theories of microeconomics illustrated through Figure 12 illuminate the three distinct practices adopted by entrepreneurs, viz. monopolistic versus perfect competitive kind of approaches in the product market to yield abnormal profit versus normal profit (Koutsoyiannis 1979; Amit and Schoemaker 1993; Peteraf 1993). In between the above mentioned two extremes lies the stage of Chamberlin's theory of monopolistic competition yielding supernormal profit (Koutsoyiannis 1979; Amit and Schoemaker 1993; Peteraf 1993). It seems the profiteering attitudes of entrepreneurs orient them to earn supernormal profit and practice the process of monopolistic competition, as monopolistic practice in product market is not permitted. Reason remains that in the case of perfect competition, an entrepreneur is left only with normal profit that is, like normal wages as earned by any other worker engaged in business, and former does not get anything for bringing land, labor and capital while executing his business activities on one hand and taking the risk and uncertainty (Knight 1921) of business on the other. Meaning, the profiteering attitude of business induces the entrepreneurs to look for technological, market, economic, social and psychological innovation in market place and market space. To proceed on the path, entrepreneur tries to maximize revenue and minimize cost. During revenue maximization process, one has to maximize the price of product as well as quantity demanded or both. It is this quantity demanded, which is maximized by increasing consumption. The volume of consumption need not be constrained by actual quantity consumed by customers but volume actually bought by them. It is immaterial, whether consumption has taken place at customers' end or not. For entrepreneur, it is volume bought by customers what matters, whether product is consumed or used, lying idle, obsolete, stolen, damaged, thrown out, partially consumed or used, pilferage before technological life (electronic products), or persuaded to buy without any use for customers (just only for nice to have and possess by customers). In all these cases, except full utilization by customers with the end of technological life of the product, the whole process of extraction through production from mining stage to marketing and servicing stage becomes wastage only despite huge resources from planet in the form of ores, inanimate energy like fuels, human skills and effort, facilitation of technology design and development becomes shear waste. In this process, who is the gainer versus who is the looser? Little consideration suggests that at the face of it, entrepreneur looks to be gainer with supernormal profit for product manufacturing and he or she becomes millionaire, billionaire, or trillionaire depending upon his or her abilities, and people possessing less skill in terms of either technological and commercial or entrepreneurial becomes looser. However, our assumption remains that mother planet earth has got infinite resources. Is it so? One should appreciate that mother planet has got quite limited resources either endowed with nuclear one when separated from sun or physical one like land and

environment conducive to and sufficient for survival of organisms including human beings, or still another one like fossil fuels, which was cooked and stored by our mother earth in millions of years. Central question remains, can we afford to waste these… as being done in the mindless race of growth and development through the motive of profiteering via actual versus pseudo consumptions in name of life style, flying like bird while conquering time and space, food habits, living standards, multiplexes, lifting in multistoried houses with the process called consumerism, modernity, digitized lifestyle, capitalism and so on?

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Flexibility in Corporate Governance Practices: An Inter - Industry Comparison from India

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Abstract

Flexibility is the ability to change or react with little penalty in time, effort, cost or performance. Corporate governance is concerned with increasing the transparency, accountability and fairness in an organization. SEBI introduced the revised Clause 49 in an attempt to strengthen the corporate governance level of the companies. This paper conducts an inter-industry comparison to analyze if the flexibility of the organizations is contingent to their industry associations in adapting to the various corporate governance regulations in India. An inter-industry comparison is relevant as the firms operate in different external dynamics. Also, such a comparison is important as researchers have analyzed the relation between corporate governance and product market competition, ownership structure, global exposure etc. (which varies among various industries). However, to our best knowledge, a comprehensive and a formal inter-industry comparison has not been drawn so far in the literature. Corporate governance level of 420 non-financial sample firms has been assessed keeping the revised Clause 49 as the benchmark. The reason behind using the revised Clause 49 as a basis to assess the level of governance lies in its uniform applicability to all the listed companies. The results reveal that the corporate governance level is highest for ICT and pharmaceutical sector companies, which have relatively higher global exposure compared to the other sectors in India. Also, the governance level is the least for the oil, gas and power sector which can be explained by the dominance of public sector companies in this industry. The reason behind the lower level of flexibility in public sector companies can be attributed to the difference in the institutional set-ups (accountability, distribution of power, monitoring authority, political influence etc.) of public and private sector enterprises.

Keywords: *Board independence, Clause 49, corporate governance, India.*

Introduction

Flexibility is the ability to change or react with little penalty in time, effort, cost or performance (Sushil, 1997). In the prevailing turbulent environment and the increased globalization, flexibility has become the crucial element for the survival of the organizations. This paper attempts to analyze if the flexibility of the organizations is contingent to their industry associations. The flexibility of the organizations is assessed with respect to adapting to the various regulatory perspectives related to corporate governance regulations. Corporate governance is about promoting

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the culture of corporate fairness, transparency and accountability in an organization (Witherell, 2002). Good governed companies enjoy higher firm value (Bebchuk et al., 2009; Black et al., 2006), reduced managerial slack (Hart, 1995) and higher foreign direct investment (McKinsey, 2000). An extensive literature is found on corporate governance in context of developed countries. In India corporate governance gained prominence only after the liberalization of the economy in 1991. Indian companies started focusing on improving the corporate governance standards to compete with the foreign players (Davies, 2012). The first step in this direction was taken by the Confederation of Indian Industry (CII) by issuing a voluntary code for corporate governance. A series of corporate frauds in India and worldwide, further motivated the policy-makers to strengthen the governance culture in the economy. SEBI introduced a set of regulations on corporate governance, in the form of Clause 49, in 2005 which became mandatory for all the listed companies to follow (SEBI, 2004). The Clause 49 was further revised in 2014 and the revised clause came into effect from October 1, 2014 (SEBI, 2014). The revised Clause 49 has empowered the shareholders by mandating their prior approval on various crucial decisions (related party transactions, remuneration of directors etc.). Indian legal system provides one of the best investor protections in the world, but the implementation of the regulations is a major cause of concern in the country (Chakrabarti et al., 2008).

In 2005, around 70% of 1245 private sector companies listed on BSE (Bombay Stock Exchange) were in compliance with more than 80% of the codes of the Clause 49 (Gupta and Parua, 2006). This paper takes this analysis forward by assessing the corporate governance level of the sample companies keeping the revised Clause 49 as the benchmark for the purpose and conducting an inter-industry comparison to analyze if the industries exhibits a differential flexibility is terms of adapting to various corporate governance practices mandated by SEBI. Such a comparison makes sense as the industries differ in terms of the capital requirement, product market competition, global exposure etc. A comparison is also drawn to compare the specific aspects of corporate governance among various industries.

This paper is organized as follows. Section II provides the review of the literature. Section III presents the methodology and data details. Data analysis and findings are presented in Section IV. Finally, Section V concludes the paper.

Review of Literature

The review of literature has been divided into the following themes:

A. Flexibility and Related Business Perspectives

Flexibility is a strategic driver to firm performance and it is not limited to only technology. The concept of flexibility finds its relevance in all the business streams: operations, marketing, finance etc. (Sharma et al, 2010). In the current turbulent environment the need of flexibility becomes even more crucial and it can become the core competence of the firm (Kak and Sushil, 2002; Kak, 2004). Sushil (2005) corroborated the need of flexibility as “organizations that are under high continuity forces as well as high change forces are ‘synthesizers’ and are supposed to exhibit strategic flexibility to integrate the opposing forces acting simultaneously.”

B. Corporate Governance Compliance in Emerging Markets

Governance codes were similar across developing countries. However, the degree of compliance varies among the countries (Asroy and Crowther, 2004). Gupta and Parua (2006) analyzed the corporate governance of the sample companies on the basis of Clause 49 and raised concerns over the independence of the Audit Committee and disclosure and formation of Remuneration Committee. The authors also reported that more than 70% of the sample companies complied

with more than 70% of the codes. In a similar exercise, Shukla (2008) analyzed the corporate governance practices of 130 companies listed on Bombay Stock Exchange (BSE) in India. The authors raised concern over the board independence, disclosure of information on Nomination Committee and the absence of Remuneration Committee. Akinkoye and Olasanmi (2014) assessed the compliance level of 237 Nigerian listed companies and reported that the average compliance was 72.15%. The lowest level of compliance was reported with the codes related to the board structure and the executive remuneration. Singh et al. (2013) raised concern over the lack of the spirit of the adoption of the culture of good governance in the companies in India. The authors reported that only 10% of the sample companies got their governance policies assessed by an external rating agency. Only 20% of the sample companies offered a stock price linked incentive plan for the senior management.

C. Corporate Governance and Different Industry Parameters

The aim of corporate governance is to reduce managerial slack. Researchers in literature have analyzed the interplay between the impact of corporate governance and the competition level of different industries. Analyzing the data of 500 firms for nine years, Januszewski et al (2002) reported that corporate governance and product market competition were complements to each other. The positive effect of good corporate governance was enhanced by higher competition level. Product market competition was the main source to reduce managerial slack when the firm's corporate governance failed (Husto and Serrano, 2002). Analyzing the data of 794 firms from 24 countries, there was a positive association between the transparency and disclosure scores and various measures of cross boarder interactions (US listing, US investment flows, exports to and operations in the United States) [14]. Rennie (2006) provided confirmatory evidence that corporate governance became stronger in the companies because of the increased competition in the market. Giroud and Mueller (2011) reported that the impact of weak corporate governance (in terms of lower operating performance and lesser firm value) is more pronounced in the non-competitive industries. Reference [14] pointed out global competition for product and talent could be a major driver behind the good governance practices of the firms.

This study could not find any study which conducts an inter-industry comparison to compare the governance practices of different industries. The inter-industry comparison is important to analyze if the corporate governance compliance is impact by various parameters that differ among various industries (product market competition, global exposure, foreign institutional investor's ownerships, government dominance in certain industries etc). This paper addresses this gap and conducts an inter-industry comparison to analyze the governance practices of different industries.

Sample, Scope and Methodology

This paper attempts to conduct an inter-industry comparison to analysis the industry wise variation in the corporate governance level of the companies. The initial sample consists of 500 companies listed on the National Stock Exchange (NSE) of India. After excluding all the financial firms, for which the revised Clause 49 has limited applicability, the final sample consists of 420 firms. The sample companies have been classified into 49 industries. The sample companies have been reclassified into 12 sectors based on the methodology used by Singh et al. (2013). The revised Clause 49 has been taken as a benchmark to assess the corporate governance level of the companies as it is uniformly applicable to all the listed companies in India. Thirty codes have been extracted from the revised Clause 49 and the sample companies are scored based of the compliance with these codes. Based on the methodology used by Gupta and Parua (2006) and Shukla (2008), a company has been assigned "1" if case of compliance and "0" has been assigned if the company does not comply with a specific code. In this way, the company

can get a maximum score of 30, if it complies with all the codes and 0, if it complies with none of the codes.

A. Inter-Industry Comparison of the Corporate Governance Level of Various Industries

The mean compliance level of all the industries is calculated and the corporate governance level of various industries is compared using the ANOVA F- test. There are two underlying assumptions behind the ANOVA F-test: similar group sizes and homogeneity of various across the groups. Therefore, this study conducts two robustness tests (Welch F-test and Brown-Forsythe F-tests) to test the level of significance, if any of these assumptions is getting violated.

To delve deeper into the analysis and to ascertain for which industries the mean compliance level is significantly different, a post hoc test is conducted. Post hoc test consists of the pair-wise comparison that is designed to compare the mean of all possible combinations of the treatment groups (Field, 2009). The popular post hoc tests are Tamhane's T2, Dunnett's T3, Games-Howell and Dunnett's C. The present study conducts the Games-Howell post hoc test as this test performs well under the violations of the assumptions of equal group sizes and the homogeneity of variance across different groups (Thompson and Morgan, 2008; Field, 2009)

B. Comparison of the Specific Aspects of Governance of Various Industries

The paper highlights those codes for which the level of non-compliance is more than 10%. The present study seeks to analyze if the level of non-compliance to these codes is influenced by the industry classification. Pearson's chi-square test has been used to test the association between the compliance with the specific aspects of corporate governance and the industry classification. Pearson Chi-square test draws the comparison between observed frequencies in different categories and the expected frequencies in those categories (Field, 2009). Pearson's chi square statistic can be given by the following equation.

$$\chi 2 = \sum \frac{(\text{observed}_{ij} - \text{model}_{ij})^2}{\text{model}_{ij}}$$

In the formula, rows and columns in the contingency table are presented by i and j, respectively. The observed frequencies are the frequencies observed in different categories and the expected frequencies are calculated by the following formula.

$$E_{ij} = \frac{\text{row total}_i - \text{column total}_j}{n}$$

In the formula, n represent the total number of observations. Expected frequencies are calculated for all the cells in the contingency tables (for example 9 cells in 3*3 contingency table)

The assumption behind the chi-square test is that the sampling distribution of the test statistic has an approximate chi-square distribution. This assumption is valid only if the expected count of all the cells in the contingency table is greater than 5. However, if this assumption is violated, Fisher's Exact test or Monte Carlo method should be used to test the level of significance (Table IV) (Field, 2009; Matteoni et al., 1999)

Data Analysis

Table I presents the descriptive statistics of the compliance level of 12 industries. F-test statistics have been computed to compare the mean compliance level of different industries.

Table 1: Industry-Wise Descriptive Statistics

	Mean	Median	Mode	Minimum	Maximum	Standard deviation	F-test statistics
Capital Goods	90.12	92.00	96.15	65.38	100.00	7.35	
Chemicals	92.77	94.43	96.15	73.08	100.00	5.65	
Construction	91.94	92.59	100.00	68.00	100.00	6.11	
Electricals	92.81	94.43	100.00	79.31	100.00	5.92	
FMCG	93.18	96.00	96.15	82.14	100.00	4.81	3.58
ICT	94.12	96.15	100.00	85.19	100.00	4.46	(0.001)***[a]
Metal	90.47	92.00	88.00	74.07	100.00	7.22	(0.043)**[b]
Miscellaneous	92.18	92.59	96.15	57.69	100.00	7.50	(0.001)***[c]
Oil, Gas and Power	83.77	86.82	96.30	51.85	100.00	14.06	
Pharmaceuticals	92.77	92.59	96.30	85.19	100.00	4.46	
Textiles	92.91	96.00	96.15	72.00	100.00	6.32	
Transport	91.19	92.59	100.00	36.00	100.00	11.68	

A. Descriptive Statistics of the Level of Compliance of Different Industries

It is evident from Table I that the mean compliance level is the least for the oil, gas and power sector (83.77%) followed by the capital goods sector (90.12%). The compliance level is highest for the ICT (information, communication and technology) sector (94.14%), which includes IT and telecom companies. The standard deviation is also the least for the ICT and pharmaceutical sectors (4.46%).

The highest mean compliance level of ICT sector (94.14%) is followed by FMCG sector (93.18%). There are companies within each sector with a compliance level of 100.00%.

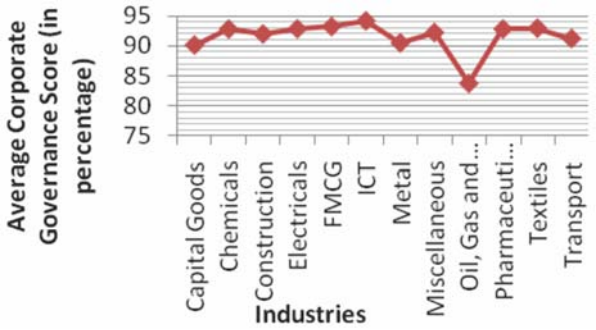


Figure 1: Mean Corporate Governance Compliance Level across Different Industries

B. ANOVA Statistics to Compare the Mean Compliance Level across Different Industries

The F-test statistics (significant at 1% level of confidence) rejects the null hypothesis (Table I) and confirms the alternate hypothesis that there is a significant difference in the mean compliance level of different industries.

1. Robustness Tests

The F-test statistics is based on two assumptions: 1. The group size should be similar across all the groups. 2. There should be the homogeneity of variance across different groups. Since

the group size of all the groups is not the same, this study conducts two robustness tests: Welch test and Brown-Forsythe tests. These tests overcome the limitations of the violations of these two assumptions. These tests also confirm the rejection of null hypothesis at 5% and 1% level of significance, respectively.

The F-test statistics and the robustness tests confirm that there is a significant difference in the mean compliance level of different industries.

C. Comparison of the Inter-Industry Compliance Level

To delve deeper into the analysis and to ascertain for which industries the mean compliance level is significantly different, a post hoc test is conducted. Post hoc test consists of the pair-wise comparison that is designed to compare the mean of all possible combinations of the treatment groups (Field, 2009). The popular post hoc tests are Tamhane's T2, Dunnett's T3, Games-Howell and Dunnett's C. The present study conducts the Games-Howell post hoc test as this test performs well under the violations of the assumptions of equal group sizes and the homogeneity of variance across different groups (Field, 2009; Thompson and Morgan, 2008). The results of the Games-Howell test are summarized in Table II.

Table 2: Summary Statistics of the Difference in the Means Compliance Level across Different Industries

J I	Capital Goods (I-J)	Chemicals (I-J)	Construction (I-J)	Electricals (I-J)	FMCG (I-J)	ICT (I-J)
Capital Goods	0.00	2.65	1.83	2.69	3.06	4.00
Chemicals	-2.65	0.00	-0.82	0.04	0.41	1.35
Construction	-1.83	0.82	0.00	0.86	1.23	2.17
Electricals	-2.69	-0.04	-0.86	0.00	0.37	1.31
FMCG	-3.06	-0.41	-1.23	-0.37	0.00	0.94
ICT	-4.00	-1.35a	-2.17	-1.31	-0.94	0.00
Metal	-0.35	2.30	1.47	2.34	2.71	3.65
Miscellaneous	-2.06	0.59	-0.23	0.63	1.00	1.94
Oil, Gas and Power	6.35	9.00	8.18	9.04	**-9.40 (0.07)***	**-10.34 (0.03)****
Pharmaceuticals	-2.66	-0.01	-0.83	0.03	0.40	1.34
Textiles	-2.79	-0.14	-0.96	-0.10	0.27	1.21
Transport	-1.07	1.58	0.76	1.62	1.99	2.93

J I	Metal (I-J)	Miscellaneous (I-J)	Oil, Gas and Power (I-J)	Pharmaceuticals (I-J)	Textiles (I-J)	Transport (I-J)
Capital Goods	0.35	2.06	-6.35	2.66	2.79	1.07
Chemicals	-2.30	-0.59	-9.00	0.01	0.14	-1.58
Construction	-1.47	0.23	-8.18	0.83	0.96	-0.76
Electricals	-2.34	-0.63	-9.04	-0.03	0.10	-1.62
FMCG	-2.71	-1.00	**9.40 (0.07)***	-0.40	-0.27	-1.99
ICT	-3.65	-1.94	**10.34 (0.03)****	-1.34	-1.21	-2.93
Metal	0.00	1.71	-6.70	2.30	2.44	0.72

Miscellaneous	-1.71	0.00	-8.41	0.60		-0.99
Oil, Gas and Power	6.70	8.41	0.00	**-9.00 (-0.09)***	9.14	7.42
Pharmaceuticals	-2.30	-0.60	**9.00 (-0.09)***	0.00	0.13	-1.59
Textiles	-2.44	-0.73	-9.14	-0.13	0.00	-1.72
Transport	-0.72	0.99	-7.42	1.59	1.72	0.00

Note: This table presents the post-hoc test results of Games-Howell test. (I-J) represents the difference in the mean compliance level of two industries. ***, ** and * represent compliance level at 1%, 5% and 10%, respectively.

A detailed inter-group comparison confirms that the mean compliance level of ICT sector is higher (10.34%) than oil, gas and power sector at 1% level of significance. The results also report that the mean compliance levels of FMCG (93.18%) and pharmaceutical sectors (92.77%) are significantly higher than the mean compliance level of oil, gas and power sector (83.77%). The findings are in conformity with [14] which confirmed that the corporate governance policies of Indian IT firms were superior to the non-IT firms in the country. The reason behind the superior governance practices was attributed to the fact that compared to the other firms, Indian IT companies had higher exposure to the global competition. The present study also reports similar results, which reflects in the highest level of compliance level of the ICT sector (94.12%). The explanation behind the lowest level of the compliance level of the oil, gas and power sector can be traced back to the dominance of public sector companies (57.14%) in this sector. Table III presents that the oil, gas and power sector is comprised of 57.14% public sector companies and the mean compliance level of the public sector companies is 75.91%. The mean compliance level of private sector companies in the oil, gas and power sector is 94.25%.

Table 3: Descriptive Statistics of the Compliance Level of Public and Private Sector Companies in Oil, Gas and Power Sector

Oil, gas and power sector (28 companies)		
Compliance level (percentage)	Private sector companies	Public sector companies
Total companies	12	16
Mean	94.25	75.91
Maximum	100.00	92.31
Minimum	79.31	51.85
Standard Deviation	6.50	13.08

In addition to analysis conducted, this study attempts to ascertain the association between the level of compliance of the individual codes (the codes for which the level of non-compliance is more than 10%) and the industrial classification for which the mean compliance level is significantly different across different groups. The various codes for which the level of non-compliance is more than 10% are:

i. Presence of at least one woman director on the board
ii. Number of independent directors on the board
iii. Evaluation criteria for independent directors
iv. Meeting of independent directors
v. Shareholders' approval for the fees paid to the non-executive/independent directors
vi. Percentage of non-executive directors in Nomination and Remuneration Committee
vii. Independent director on the board of the material non-listed Indian subsidiary
viii. Details of the material RPTs disclosed in the quarterly corporate governance report
ix. Policy dealing with the RPTs disclosed in the annual report
x. Shareholders' approval obtained for the material RPTs

The results of the ANOVA test imply that there is a significant difference in the mean compliance level of different industries. A detailed post-hoc analysis reports that the mean compliance level of oil, gas and power sector is the least (83.77%) amongst all the industries and it is significantly lower than the ICT (94.12%), FMCG (93.18%) and pharmaceutical sectors (92.77%). An individual code-wise analysis presents a better understanding of any association between the compliance of various codes (the codes for which the level of non-compliance is more than 10%) and the industry to which the company belongs. Table IV presents the summary statistics of the Chi-square test performed to analyze this association.

Table 4: Disaggregate Analysis to Test the Association between the Level of Compliance of Individual Codes and the Industry Classification

Provisions	Value	Capital Goods	Chemicals	Construction	Electricals	FMCG	ICT	Metal	Miscellaneous
Presence of at least one woman director on the board	0	6	7	7	0	4	2	2	6
	1	19	29	58	20	35	31	21	35
Numbers of independent directors on the board	0	5	5	9	4	3	3	8	4
	1	20	31	56	16	36	30	15	37
Evaluation criteria for independent directors	0	15	19	41	10	21	18	13	19
	1	10	17	24	10	18	15	10	22
Meeting of independent directors	0	7	7	7	1	2	4	3	3
	1	18	29	58	19	37	29	20	38
Shareholders' approval for the fee paid to non-executive/independent directors	0	4	3	9	5	5	3	6	5
	1	12	22	19	9	16	22	4	13
Percentage of non-executive directors in Nomination and Remuneration Committee	0	6	6	17	2	6	2	6	12
	1	19	30	48	18	33	31	17	29
Independent director of the holding company on the board of the material non-listed subsidiary	0	2	2	3	2	3	1	0	8
	1	2	5	33	10	9	11	5	14
Details of the material RPTs disclosed in the quarterly corporate governance report	0	6	6	8	6	11	10	3	8
	1	0	0	1	0	0	2	1	2
Policy dealing with the RPTs disclosed in the annual report	0	2	4	12	3	4	2	4	3
	1	23	32	53	17	35	31	19	38
Shareholders' approval obtained for the material RPTs	0	3	3	5	2	8	5	0	6
	1	3	3	4	4	3	7	4	4

Provisions	Oil, Gas and Power	Pharmaceuticals	Textiles	Transport	Total	Chi-Square Test Statistics
Presence of at least one woman director on the board	9	4	0	7	54	21.829[a] (0.016)**
	19	29	29	41	366	
Numbers of independent directors on the board	15	2	3	5	66	35.447[a] (0.001)***
	13	31	26	43	354	
Evaluation criteria for independent directors	21	17	15	24	233	8.804 -0.648
	7	16	14	24	187	
Meeting of independent directors	12	7	2	9	64	26.774[a] (0.003)***
	16	26	27	39	356	
						12.774[a]

Shareholders' approval for the fee paid to non-executive/independent directors	1	5	4	8	58	-0.289
	5	12	9	19	162	
Percentage of non-executive directors in Nomination and Remuneration Committee	7	5	9	12	90	13.202 -0.283
	21	28	20	36	330	
Independent director of the holding company on the board of the material non-listed subsidiary	2	3	2	1	29	13.552[a] -0.183
	11	9	7	13	129	
Details of the material RPTs disclosed in the quarterly corporate governance report	7	10	5	9	89	6.910[a] -0.821
	1	3	1	2	13	
Policy dealing with the RPTs disclosed in the annual report	3	0	5	4	46	12.744[a] -0.274
	25	33	24	44	374	
Shareholders' approval obtained for the material RPTs	4	8	2	6	52	9.134[a] (0.632)

Note: The table presents the summary of Pearson Chi-square test statistics. ***, ** and * represent the level of significance at 1, 5 and 10% respectively. 'a' represents the level of significance as reported by Monte Carlo method.

The results of the Chi-square test report that there is a significant association between the level of compliance and the industry classification for the following codes.

The various provisions for which the Chi-square test statistics are significant are summarized below.

1. Presence of at Least One Woman Director on the Board

   The Chi-square test statistics is significant at 5%. The results signify that there is an association between the compliance of this provision and the industry to which the company belongs. The maximum level of non-compliance is in the oil, gas and power sector (32.14%) followed by capital goods sector (24%).

2. Number of Independent Directors on the Board

   The Chi square statistic significant at 1% level of significance confirms a significant association between the compliance of this provision and the industry association of the company. The non-compliance is highest for the oil, gas and power sector (53.57%) and for the metals sector (34.78%). The level of non-compliance is the minimum for the pharmaceuticals (6.06%), FMCG (7.69%) and ICT sectors (9.09%).

3. Meeting of Independent Directors

   The Chi-square test statistic is significant at 1%. The results corroborate that there is an association between the compliance of this provision and the industry to which the company belongs. The companies in the oil, gas and power (42.86%) and the capital goods sectors (28.00%) present the maximum level of non-compliance of this provision. The minimum non-compliance of this provision is noticed in the electrical (5.00%) and pharmaceutical sectors (5.13%).

Concluding Observations

In the prevailing turbulent environment the researchers and the practitioners have highlighted the rising need of flexibility be it system flexibility, or process flexibility etc. This paper attempted to analyze if the flexibility is contingent to the industry associations with respect to adapting various corporate governance practices imposed by the regulators. Corporate governance is concerned with the system in which the organizations are directed and controlled. Several studies have analyzed the relationship between corporate governance and product market competition, global exposure, foreign ownership etc which varies across industries. A formal inter-industry comparison has not been drawn in the literature. This study fills this gap and compares the

corporate governance practices of various industries. The study uses revised Clause 49 as assess the level of corporate governance of various industries. The revised Clause 49 has been used as a basis to measure the corporate governance level of the companies as this clause is uniformly applicable to all the listed companies in India.

The results report that for all the companies the level of corporate governance is more than 90% except oil, gas and power sector (83.77%). The minimum level of corporate governance of this industry can be explained by the dominance of public sector companies in this sector. The corporate governance compliance rate of public sector companies is 75.91% in the oil, gas and power sector. The results clearly indicate that the public sector organizations lack flexibility to adapt to various regulatory requirements. The lack of flexibility of the public sector organizations can be attributed to the difference in the institutional set-ups of the public and private sector companies. For example, the decision making in public sector organizations might be slow owing to the factors like differences in accountability, distribution of power, monitoring authority, political influence etc. which might in turn cause the lack of flexibility in public sector organizations to respond to the regulatory changes. From the governance perspective, the findings raise serious concerns as the government companies should have exhibited better compliance than the private sector considering them being the custodians of substantial amount of public wealth which in turn, calls for the need of increased transparency and accountability for PSUs. The level of corporate governance is highest for the ICT sector (94.12%). The highest level of flexibility exhibited by the ICT sector companies can be attributed to the tough intra-industry competition, the dynamic nature of the industry itself and to the higher global exposure (in terms of higher global competition for product and talent). Infosys which is the major IT giant in India has been the pioneer of adapting the culture of good governance in the country.

To conclude, the corporate governance level of most of the industries is more than 90%. The level of corporate governance is influenced by the global exposure of the industry which gets reflected in the highest governance level of the Indian ICT companies. The findings are in line with the viewpoints of Khanna and Palepu (2004), who argued that the good governance practices of Indian IT sector was an attempt to attract the global pool of customers. However, the paper also raises concerns over lack of flexibility and the governance level of public sector companies in India, which pulls down the governance level of oil, gas and power industry to the bottom level. The findings draw the attention of the policy-makers to address the various possible institutional differences in the public sector organizations, which might be responsible for the relative rigidity of the public sector companies to respond to various regulatory (governance) requirements. Gender diversity and the lack of independent boards are the major areas of concerns in the oil, gas and power sector.

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Learning, Innovation and Entrepreneurship towards Flexibility

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Abstract

Organizations are working in a very uncertain and complex environment as compared to the past. Globalization, knowledgeable customers, technological advancement, and availability of skilled workforce are some of the major factors that catalyzed the environmental complexity in last one or two decades. Satisfying the diverse and changing customers' demand are the major parameters that decide about organization survival and growth. Flexibility is the process that gives strength to organization for managing these changes. Learning, innovation and entrepreneurship are the three important aspects that have emerged as critical processes for organization success, and effect the degree of flexibility. This study has explored the integration aspects of learning, innovation, and entrepreneurship with flexibility. This empirical study has been done based on the survey conducted on IT and Automobile industry in India. Step-wise regression method has been applied on 225 samples to explain the interrelations of learning, innovation, and entrepreneurship with flexibility focus in the organization. The final model reflects the effects of learning, innovation, and entrepreneurship factors on Flexibility.

***Keywords**: Entrepreneurship, Flexibility, Innovation, Learning, Process Integration.*

Introduction

Satisfying the diverse and changing customer demands is one of the primary concerns for the industry in the current knowledge era (Valle *et al*., 2011). Organizational success is determined by the extent it can manage the changes (Folami and Powers, 2009).With this uncertain environment, while some organizations not only survived but remain on the growth trajectory, there are organizations that even failed to survive or struggled for their existence (Drucker, 1985). Importance of survival and growth issues was also discussed in theories related to organization life cycle.

System theory defines organization as a complex system with various sub-systems within itself, and integration of these sub-systems has been described as one of the important aspects for system's performance. Integrated view of these sub-systems help to remain ahead in the competition. Scott (1961), in his Modern organizational theory, explained identification of important organizational processes and understanding of their interrelationships, as one of the important means to know the organization. Organizations are expected not only to identify these processes but also to think about integration of these for effective functioning considering organization as a system. Lane et al. (2006) have discussed the integration process of learning, innovation,

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with organizational structure. Similarly, integration of HRM, leadership, and strategy with organization change has been explained by Stace and Dunphy (1992). Importance of process integration was further explained by Bishwas and Sushil (2017) on their study about critical processes integration for organizational innovation.

This study has explored the integration aspects of three important organizational processes with Flexibility in the organization. The three critical processes (learning, innovation, and entrepreneurship) and its effect on flexibility have been explained using step-wise regression.

Learning, Innovation, Entrepreneurship and Flexibility

Learning has been considered as one of the necessity for succeeding in the competition (Prahalad and Hamel, 1990). It increases the renovation and adaptive capability of the organization (Sushil, 2004), helps in understanding the external and internal environment and act accordingly, and has been defined a necessity for organizational survival (Epstein, 2003). Continuous learning supports to remain ahead in the competition, and is described as one of the key things for growth (Maurer and Weiss, 2010).

Learning is one of the vital processes where failure results declining performance and threat of survival and growth (Senge, 1990).Learning has been defined as the foremost cause of organizational failure. As par Kotter and Cohen (2002), information availability, ready to learn, innovation oriented solution are some of the substantial concerns to empower the organization for long-term survival. Jitnom and Ussahawanitchakit (2010) explained learning as one of the organizational strategic capability. According to Schwandt and Marquardt (2000) findings, in next 10 years', only the organizations with learning orientation will survive and rest will be in trouble. Learning leads to improve the mutual understanding towards any integrated action in the organization (Campbell and Armstrong, 2013). As par Ortenblad (2004), organizational learning, work learning, learning climate, and learning structure are the three dimensions that decide whether the learning process is effective or not.

Managing the quick demand change by diverse customer require focusing on new innovative solutions. The findings of Xu et al., (2011) strengthens this view that "two-third per cent of the prosperous companies revenue derive from novel services and products emerged within five years' frame". Continuous learning process intensifies creativity leading to more innovation. Learning process facilitate knowledge acquisition that effect the innovation level significantly (Chermin and Nijhof, 2005).

In the current VUCA world, Innovation can be seen as a source of strength where learning facilitates the novel product development leading to customer satisfaction (Baker and Sinkula 1999; Vicenzi and Adkins, 2000), and Organizational ability to develop innovative solutions provides strength for its survival (Sushil, 2004; 2013).Both financial and non-financial performance measures (including innovation, CRM, and customer satisfaction) are effected by learning and innovation processes(Goh et al., 2012, Battor and Battour, 2013, Pantouvakis and Bouranta, 2013).

Customer satisfaction has been acknowledged as a vital aspect where innovation play a significant role to satisfy customer's demands. Organization's innovation orientation depends on the extent of customer satisfaction dimensions (Ruggles and Little, 1997). Innovative organization explore the possible opportunities from the uncertain environment because of their capability to attract new customers and markets better than their competitors (Michael and Pearce, 2009).

Sushil (2003) has highlighted that innovation and learning are strongly interrelated with each other that strengthen organization for long term growth. Calisi*et al*. (2013) have explained the

effect of learning on innovation. Innovation in the organization can be promoted through effective learning process (Hung et al., 2010). Incorporating flexible approach in the organization facilitates the process to manage the change (Heilbrunn, 2008).

Dreyer and Gronhaug (2004) have defined flexibility asone of the important resources for organization. Innovation and flexibility have been described as two critical parameters to measure the growth (Maisel, 1992). Importance of flexibility has been further discussed bySushil (2004, 2013) considering it as an instrument for managing the environmental uncertainty. The author has further, highlighted flexibility as one of the major issues which is interrelated with other critical processes like learning and innovation.Volberda (1998) has explained the concept of flexibility as organizations' capability to change and develop products, and strategies to manage the environmental uncertainty.Sharma et al. (2010) have provided a detail review on flexibility and its significance for organization.

The effect of environment uncertainty during strategic development is usually very high and flexibility concern is seen as a crucial aspect during that phase. Flexibility has been considered as atacticto gain more control in the turbulent environment. Concept of 'flexibility mix' classified flexibility into operational, strategic, and structural flexibility which explain significance and types of flexibility considering strategic, structural and operational dimensions (Volberda, 1997).As per Verdu et al. (2009), flexibility escalates the responsive ability of an organization that is related to internal, external, structural, and strategic flexibility. Eppink (1978) suggested to maintain a right fit between the organization and its environment. Integration of flexibility with other processes help to develop a collaborative culture and competence to amend as par the requirement.

Flexibility related to workforce supports to deal the workforce related uncertainty (Looise*et al*., 1998).The importance of this workforce related flexibility i.e. labour flexibility is about managing the uncertain demand and supply of labour in efficient manner (Upton, 1995).

Other than labour flexibility, strategic flexibility is another important flexibility dimension that enhances likelihoods of survival (Hitt et al., 1998; Sushil, 2014).Innovation and flexibility are the vital processes for organizational survival and growth (Bishwas and Sushil 2013).

Innovation and entrepreneurship are complementary to each other. According to Zhao (2005) combination of both are essential for organizational success in uncertainand complex environment. Michael and Pearce (2009) discussed the interrelatedness of entrepreneurship and innovation process. As par Molina and Callahan (2009), entrepreneurial orientation encourages risk taking that raise the degree of innovation and finally lead to organizational performance.

The mantras of LIFE suggested by Sushil (2007, 2013) can be seen as a guiding tool towards organization vitality and identification of the processes relevant to achieve high vital position. The first LIFE mantra has discussed about importance of integration of learning, innovation, flexibility, and entrepreneurship that have been acknowledged as critical processes for organization. These processes have been also explained as the vitalization process for the organization that contribute towards survival, and growth (Bishwas, 2011). This study strengthens the previous results on process integration with a specific focus on flexibility.

Methodology

This empirical study is based on the survey conducted on select IT and Automobile industries in India. The questionnaires for the survey have been selected from Bishwas (2015a; 2015b; 2015c).Non probability sampling techniques have been used for the data collection. Step-wise regression analysis has been used to explain the inter-relations between learning, innovation and entrepreneurship factors with flexibility. SPSS 20 software package has been used. Table 1 presents the respondents details.

Table 1: Respondents Details

Industry (n=225)	***IT***		***Automobile***	
	116 (51.55 %)		109 (48.45%)	
Average Work Experience	***Total***	***Within current Organization***		
	10.75 yrs.	6.47 yrs.		
Gender		***Qualification***		
Male	Female	Graduate	Masters	Doctorate
198 (88%)	27 (12%)	69 (30.66%)	142 (63.11%)	14 (6.22%)

Results and Discussion

The outcomes of step-wise regression analysis have been used to develop an integrated model that shows the interrelations between learning, innovation, and entrepreneurship factors on flexibility. The step-wise regression analysis has been discussed in detail.

Model Discussion

Three step-wise regression models have been developed consider ingthe three flexibility factors as dependent variables one by one (in a separate manner) and factors of other processes as independent variables (details provided in appendix). Table 2 provide the step-wise regression analysis results (details in Appendix A).

Table 2: Regression Results

Dependent Variable	Independent Variable	B-Value	R^2	SEE	Significance
Strategic Flexibility (VPF1)	Flexible Resource Usage (VPF2)	0.356	0.748	.44219	.000
	Access to Facility and Resources(VPI2)	0.197			.000
	Adaptive Capacity of Leadership (VPF3)	0.238			.000
	Proactiveness (VPE1)	0.242			.000
	Skills Variety (VPI3)	-0.086			.024
Flexible Resource Usage (VPF2)	Strategic Flexibility(VPF1)	0.419	0.741	.45217	.000
	Collaborative Environment (VPI1)	0.202			.000
	Skills Variety (VPI3)	0.133			.001
	Proactiveness (VPE1)	0.287			.000
	Organizational Learning (VPL2)	-0.218			.000
	Learning Structure (VPL3)	0.136			.007
Adaptive Capacity of Leadership (VPF3)	Strategic Flexibility (VPF1)	0.394	0.649	0.50434	.000
	Learning Structure (VPL3)	0.348			.000
	Skills Variety (VPI3)	0.161			.000
	Entrepreneurial Intensity (VPE3)	0.118			.024

Figure 1summarizes all the three step-wise regression models considering flexibility factors as dependent variables. The results show the effect of learning, innovation, and entrepreneurship (micro level factors) on flexibility factors. From the summary model, we can see that learning, entrepreneurship, and innovation factors strongly effecting the flexibility factors where the innovation factors are having higher effect as compare to other two processes. This strengthens the view that innovation and flexibility are highly interrelated processes and innovation focused organizations usually follow flexible approach more as compare to the less innovation ones.

The step-wise regression models considering flexibility factors as dependent variables separately, replicate its interrelationships with other processes. The above model suggests that Strategic flexibility (VPF1) is effected by Innovation (*access to facility and resources and skills variety*), entrepreneurship (*proactiveness*), and other two flexibility factors (*flexible resource usage and adaptive capacity of leadership*). Similarly, Flexible resource usage (VPF2) is effected by learning (*organizational learning and learning structure*), innovation (*collaborative environment and skills variety*), and one entrepreneurship (*proactiveness*) as well as flexibility factor (*strategic flexibility*). Adaptive capacity of leadership (VPF3) is positively affected by strategic flexibility (flexibility factor), learning structure (learning factor), skills variety (innovation factor) and entrepreneurial intensity (entrepreneurial factor).

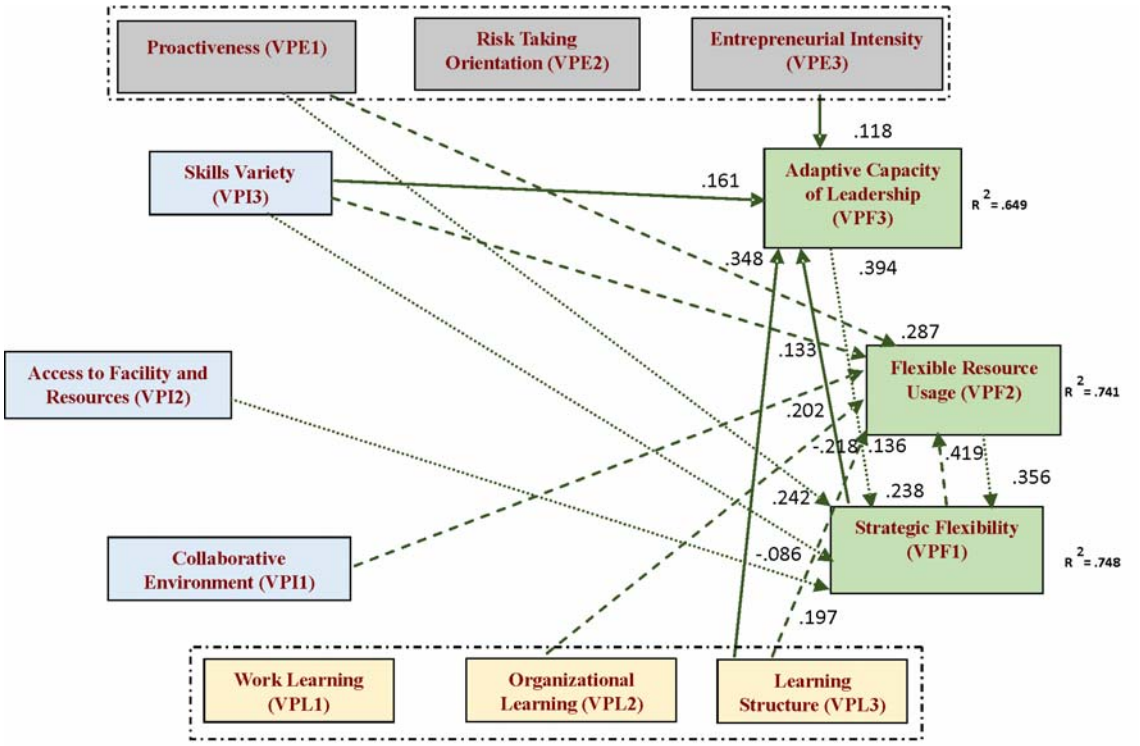


Figure 1: Summary of Step-wise Regression Models Flexibility as Dependent Variable

The results suggest that flexible resource usage, adaptive leadership capability, and proactiveness effect the degree of strategic flexibility in highly significant manner. Further, the negative value for skills variety supports the view that degree of skills diversity may restrict the strategic flexibility process. The next flexibility factor; flexible resource usage is highly effected by strategic flexibility followed by collaborative environment in the organization.The organizational learning factor is negatively related with flexible resource usage which shows that high organizational learning (well defined and rigid) reduces flexibility in usage of resources. Adaptive capacity of leadership (third flexibility factor) is again highly effected by strategic flexibility factor followed by learning structure. From all the three regression models we can conclude that out of the three factors strategic flexibility is highly effecting the two other flexibility factors which suggest that strategic flexibility need to be considered as the prime concern.

The final outcomes of this chapter strengthens the previous researchers' views which talked about interrelationships of critical organizational processes (Pascle, 1991; Baker and Sinkula, 1999; Chermin and Nijhof, 2005; Calisir*et al*. 2013).

Conclusion

Flexibility can be seen as one of the strategic resource for organization in the current uncertain and complex environment. Organizations that are ready to adapt the changes faster than their competitors will be able to remain ahead in the competition. Some of the processes like learning, innovation, entrepreneurship have emerged as critical ones for organizational growth and survival, and are having strong relation with flexibility. An integrated view of these processes may lead towards high possibility of survival and growth.

Strategic flexibility has emerged as the most important factor that is strongly effecting the other flexibility aspects. Further, Innovation process is highly related with flexibility followed by learning and entrepreneurship. Integrated view of learning, innovation, and entrepreneurship will help in developing a flexibility concern that will ultimately lead to organizational long term growth.

This study can be perceived as a fundamental work for research in process integration with specific focus on micro level flexibility analysis to manage the environment changes. The final model can be taken as a guiding framework for developing flexibility concept in the organization to understand the dimensions where it need to focus more during the planning and implementation process.

Limitations and Future Direction

The study is limited to select IT and Automobiles organizations in India that can be further extended to other industries for developing a generalized model. Specific organization focus detail case study can be conducted to validate the model.Various external variable's effect can also be considered as an extension of this study.

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Appendix A

Regression Analysis Results

Flexibility Factors as Dependent Variable

1) Strategic Flexibility as Dependent (VPF1)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.782[a]	.612	.610	.54360
2	.828[b]	.685	.683	.49043
3	.848[c]	.719	.715	.46453
4	.861[d]	.742	.737	.44639
5	.865[e]	.748	.742	.44219

a. Predictors: (Constant), VPF2
b. Predictors: (Constant), VPF2, VPI2
c. Predictors: (Constant), VPF2, VPI2, VPF3
d. Predictors: (Constant), VPF2, VPI2, VPF3, VPE1
e. Predictors: (Constant), VPF2, VPI2, VPF3, VPE1, VPI3
f. Dependent Variable: VPF1

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	103.822	1	103.822	351.347	.000[b]
	Residual	65.896	223	.295		
	Total	169.718	224			
2	Regression	116.323	2	58.161	241.817	.000[c]
	Residual	53.395	222	.241		
	Total	169.718	224			
3	Regression	122.030	3	40.677	188.506	.000[d]
	Residual	47.688	221	.216		
	Total	169.718	224			
4	Regression	125.880	4	31.470	157.930	.000[e]
	Residual	43.838	220	.199		
	Total	169.718	224			
5	Regression	126.896	5	25.379	129.796	.000[f]
	Residual	42.822	219	.196		
	Total	169.718	224			

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.697	.153		4.552	.000
	VPF2	.777	.041	.782	18.744	.000
2	(Constant)	.177	.156		1.137	.257
	VPF2	.559	.048	.563	11.626	.000
	VPI2	.377	.052	.349	7.209	.000
3	(Constant)	-.024	.153		-.159	.874
	VPF2	.422	.053	.425	8.006	.000
	VPI2	.300	.052	.278	5.812	.000
	VPF3	.273	.053	.264	5.143	.000
4	(Constant)	-.105	.148		-.713	.476
	VPF2	.322	.056	.324	5.798	.000
	VPI2	.229	.052	.212	4.384	.000
	VPF3	.230	.052	.223	4.440	.000
	VPE1	.235	.053	.237	4.396	.000
5	(Constant)	.163	.188		.868	.387
	VPF2	.353	.057	.356	6.230	.000
	VPI2	.213	.052	.197	4.073	.000
	VPF3	.246	.052	.238	4.740	.000
	VPE1	.239	.053	.242	4.524	.000
	VPI3	-.094	.041	-.086	-2.280	.024

Dependent Variable: VPF1

2) Flexible Resource Usage as Dependent (VPF2)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.782[a]	.612	.610	.54743
2	.813[b]	.661	.658	.51273
3	.829[c]	.687	.682	.49403
4	.840[d]	.706	.700	.47998
5	.856[e]	.732	.726	.45886
6	.861[f]	.741	.734	.45217

a. Predictors: (Constant), VPF1

b. Predictors: (Constant), VPF1, VPI1

c. Predictors: (Constant), VPF1, VPI1, VPI3

d. Predictors: (Constant), VPF1, VPI1, VPI3, VPE1

e. Predictors: (Constant), VPF1, VPI1, VPI3, VPE1, VPL2

f. Predictors: (Constant), VPF1, VPI1, VPI3, VPE1, VPL2, VPL3

g. Dependent Variable: VPF2

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	105.290	1	105.290	351.347	.000[b]
	Residual	66.827	223	.300		
	Total	172.117	224			
2	Regression	113.755	2	56.877	216.351	.000[c]
	Residual	58.363	222	.263		
	Total	172.117	224			
3	Regression	118.179	3	39.393	161.404	.000[d]
	Residual	53.938	221	.244		
	Total	172.117	224			
4	Regression	121.434	4	30.358	131.776	.000[e]
	Residual	50.683	220	.230		
	Total	172.117	224			
5	Regression	126.006	5	25.201	119.690	.000[f]
	Residual	46.111	219	.211		
	Total	172.117	224			
6	Regression	127.545	6	21.258	103.970	.000[g]
	Residual	44.572	218	.204		
	Total	172.117	224			

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.845	.151		5.598	.000
	VPF1	.788	.042	.782	18.744	.000
2	(Constant)	.343	.167		2.056	.041
	VPF1	.591	.052	.587	11.288	.000
	VPI1	.323	.057	.295	5.674	.000
3	(Constant)	-.190	.204		-.932	.352
	VPF1	.589	.050	.585	11.671	.000
	VPI1	.253	.057	.231	4.414	.000
	VPI3	.191	.045	.173	4.258	.000
4	(Constant)	-.256	.199		-1.291	.198
	VPF1	.455	.061	.452	7.492	.000
	VPI1	.216	.057	.197	3.823	.000
	VPI3	.169	.044	.153	3.846	.000
	VPE1	.214	.057	.215	3.759	.000
5	(Constant)	.032	.200		.161	.872
	VPF1	.451	.058	.448	7.766	.000
	VPI1	.280	.056	.255	5.018	.000
	VPI3	.136	.043	.124	3.206	.002
	VPE1	.309	.058	.310	5.317	.000
	VPL2	-.199	.043	-.207	-4.660	.000
6	(Constant)	-.030	.198		-.149	.881
	VPF1	.422	.058	.419	7.269	.000
	VPI1	.221	.059	.202	3.744	.000
	VPI3	.146	.042	.133	3.473	.001
	VPE1	.286	.058	.287	4.945	.000
	VPL2	-.210	.042	-.218	-4.972	.000
	VPL3	.136	.049	.136	2.744	.007

Dependent Variable: VPF2

3) Adaptive Capacity of Leadership as Dependent (VPF3)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.723[a]	.523	.520	.58427
2	.785[b]	.616	.613	.52505
3	.800[c]	.641	.636	.50909
4	.806[d]	.649	.643	.50434

Predictors: (Constant), VPF1

Predictors: (Constant), VPF1, VPL3

Predictors: (Constant), VPF1, VPL3, VPI3

Predictors: (Constant), VPF1, VPL3, VPI3, VPE3

Dependent Variable: VPF3

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	83.316	1	83.316	244.064	.000[b]
	Residual	76.126	223	.341		
	Total	159.442	224			
2	Regression	98.241	2	49.120	178.178	.000[c]
	Residual	61.201	222	.276		
	Total	159.442	224			
3	Regression	102.164	3	34.055	131.397	.000[d]
	Residual	57.278	221	.259		
	Total	159.442	224			
4	Regression	103.483	4	25.871	101.709	.000[e]
	Residual	55.959	220	.254		
	Total	159.442	224			

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.065	.161		6.612	.000
	VPF1	.701	.045	.723	15.623	.000
2	(Constant)	.617	.157		3.928	.000
	VPF1	.467	.051	.482	9.093	.000
	VPL3	.375	.051	.390	7.358	.000
3	(Constant)	.050	.211		.235	.815
	VPF1	.433	.051	.446	8.559	.000
	VPL3	.365	.049	.379	7.371	.000
	VPI3	.172	.044	.163	3.891	.000
4	(Constant)	-.029	.212		-.139	.890
	VPF1	.382	.055	.394	6.986	.000
	VPL3	.335	.051	.348	6.592	.000
	VPI3	.170	.044	.161	3.880	.000
	VPE3	.116	.051	.118	2.277	.024

Dependent Variable: VPF3

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Sustainable Growth Rate: A Flexible Performance Measurement Tool for Changing Business Environment

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Abstract

The Purpose of this study is to analyze the Actual Growth Rate (AGR) as well as Sustainable Growth Rate (SGR) and to investigate the overall effect of selected independent variables on sustainable growth rate (SGR).Simple random sampling technique is used to select the companies that are performing well in the Indian Stock market preferably stocks traded on Bombay Stock Exchange (BSE). Selected five companies belong to oil refineries industry in India.

From the analysis, it is observed that out of five independent variables, the dependent variable (SGR) is having asignificant relationship at 5% level of significance with three variables namely DE, ATR, and LNA. Remaining two variables namely CR and TR are having aninsignificant relationship with SGR and also found that AGR values of selected companies are less than the SGR values throughout the study period. The results of this study also enable the company to manage its financial and operating policy towards healthy growth without having an additional financial problem. Study results are suitable for companies to manage their solid performance to sustain firm's growth in the future undertakings.

Keywords: Actual Growth Rate, Capital structure, Leverage, Liquidity, Sustainable Growth Rate.

Introduction

Growth for business is very important particularly for achieving company's objective.As growth requires proportionate increase in assets without equity issuance; any asset increase must be funded with added liabilities or from retained earnings. If financial policies are unchanged, the rate of shareholders equity growth will limit sales growth because the company can maintain their performance without running into financial problems. So, monitoring firm performance is essential and be able to solve company's financial problems to sustain the growth of the company. Monitoring the current situation and company's activities by mapping sustainable growth rate can help managers to do financial planning efficiently. The sustainable growth rate is particularly valuable because it combines operating (profit margin and asset efficiency) and financial (capital structure and retention rate) elements into one comprehensive measure. Using SGR, managers and investor can begin to gauge whether the firm's future growth plans are realistic based on their current performance and policy or not. In this way, SGR can provide managers and investors with insight into the levers of corporate growth.The concept of Sustainable Growth Rate was originally developed by C. Higgins. He demonstrated that Sustainable Growth Rate (SGR) is the maximum rate at which company sales can increase without depletion

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financial resources (Higgins, 1989) .Handling Company's firm performance such as financial leverage, liquidity, asset efficiency, size and tax become the important factors that can influence the sustainable growth of company. Some companies with high growth rates will cause the company to have financial pressures. This will cause the company to face problems such as financial loss, face the high costs, have higher debt, bankruptcy and engage in the decline in market share (Fonseka, Ramos, & Tian, 2012).The company can maintain their growth by determining the factors that affecting sustainable growth. Johnson & Soenen (2003) stated that company's strategic planning over handle with essential restrictions of policy on dividend pay-out and leverage could sustain company's growth. Sustainable growth affected the company's structure changes, for example, financial leverage increased, the sustainable growth tend to increase and financial decreased, the sustainable growth also decreased (Srinivasa, 2011). The decision in managing the financial and operating activities towards the growth of the company is related to the pecking order theory, trade of theory and agency theory. The prosperity of companies is much related on how manager manage their capital structure. The use of debt is limited as companies will face the case of bankruptcy. Under pecking order theory, the company required funding financial resources by retained earnings at the beginning, but, if still having some financial problem it's necessary for the company to raise their fund on debt and followed by equity. Based on trade-off theory, growth causes firms to shift financing from new equity to debt to reduce agency problem. This also related whether manager borrows money under long-term debt, short-term or equity in addition to improve companies' growth. Moreover, the used of debt can give impact to the company earnings. To increase sustainable growth rate, the company will reduce the payment of dividend to their shareholder when real growth is higher than the sustainable growth rate. Then, the reduction of dividend payment can affect stock prices. Aligned with signaling hypothesis, the effect of dividend policy will make changes the stock prices whether stock prices will go up or down. Based on agency cost, companies that investing in asset might generate higher growth in the future and faced difficulties in borrowing against such asset. An actual growth rate below from sustainable growth rate implies that the company has more than enough capital to meet its investment needs and calls for an increase in liquid assets, a reduction in leverage , or an increase in dividend.

Literature Review

Based on Higgins (1977), sustainable growth in the business context is the maximum platform or benchmark for the company to grow their revenue without reducing its financial resources. The combinations of a company's operating element (i.e. profit margin and asset efficiency) and financial elements (i.e. capital structure and retention ratio) into a single measurement become a very valuable financial performance for every company. In order to demonstrate the interdependencies between growth and financial policy, the increasing in annual sales adequate to supported by annual sources of corporate capital. Then, to calculate the firm's SGR, the calculation needs to focus only on the observation that the addition of assets must equal the addition to liabilities and owners' equity. In other words, the new assets must be financed by new debt and an increase in equity can finance new assets through retained earnings. This research will discuss the determinants of sustainable growth rate and what are the factors that associated with a sustainable growth rate of the firm. Fonseka et al. (2012) concluded that higher leverage is given higher sustainable growth rate in Van Horne model compare with Higgins model and, Korteweg (2010)found that the company's market would rise in the future and could benefit leverage. Contrary to Anderson & Nyborg (2011)opinion that leverage would have a negative effect on the profitability and performance of the company's growth position. Subsequently, Ross (1977) through his findings shows that debt leverage has a positive influence on the growth of the company where this decision is supported by the signal impact theory. In

addition, leverage amplifies to the losses or gains in business activities (Ilie & Olaru, 2013). The leverage busts the gains and supports economic growth when it is good during the good times. As such, government and firms are using leverage at large scale. However, government and firms will deleverage during the bad times because leverage busts losses and does not support the economic growth. Therefore, financial crises happen because of the high degree of leverage and usually, deleveraging will follow a financial crisis. This can be noted that firms deleverage because they face risks; actually, not only risks but also the situations where they also want to strengthen their financial stability. In addition to the financial leverage, Wu & Chau Kin Au Yeung (2012) found that firm's asset tangibility and initial market book ratios that were the growth types of companies able to determine and predict different future leverageand, the authors say that a low-growth company will tend to issue new debt than equity during improved market and economic conditions while for high-growth companies will be more likely to raise debt and equity. Hence, most companies will invest and use their financial resources in line with their growth type. Empirical results produced by Chen, Gupta, Lee, & Lee (2013)in their study stated that they support the importance of covariance as well as the process of raising the average growth rate between growth and profit rates to determine in the company's dividend payment. In the study, 31,255 sample data were collected from 1969 to 2011 to examine the inter temporal behavior of covariance which might be a little more prominent than facts about the loss of a company's dividend. In addition, Chung, Na, & Smith (2013)has found that there is no significant evidence that capital structure will influence the probability of failure and acquisition. They used data from the oil industry and stated that firms are inclined to increase their leverage when they face attractive growth opportunities. Another reason to increase firm leverage is when these firms face poor operating performance and they increase firm leverage to reduce equity value or when they require borrowing. In addition to that, firms acquired when they face rapid growth and this can reduced financial slack. They claim that firms can survive and operate with persistently low leverage without being focused for acquisition including getting potential financing sources which this supports the pecking-order theory by using internal financing (retained earnings). This research is expected that financial leverage is associate with the sustainable growth rate. As regards to sustainable growth rate, Amouzesh et al. (2011) in his study examined the relationship between sustainable growth rates, firm performance and liquidity. To get the results of the study, they have used the linear regression method to analyze the relationship between each variable and have used 54 companies listed in the Iranian financial market as a sample of the study. Their research results show that the actual deviation of the growth rate from the sustainable growth rate is related to book price ratio and return of assets. Subsequently, Bivona (2000) in its study examined the relationship between the sustained growth policy in the changing market and profitability. In this study, the authors have found that sustainable corporate establishments have three main elements, namely the structure of resources, operational activities and management activities. This has shown that feedback approaches are useful for supporting small entrepreneurs in planning a business growth strategy for a company. In addition, this feedback approach can fulfill the profitability level, external key factors' requirements, and a desired balanced financial structure. Also, Obstfeld (2012) discussed global financial stability and some effect for individual countries' external adjustment process and recorded the liability positions and proliferation of gross international asset. In planning a company, one will consider continuous net financial flows if a company faces serious risks and the rapid growth of global financial flows. The author of this study finds that the global imbalances of indefinitely remain an important target for financial motivation, macroeconomics, and policy checks. At the same time, this is especially important for policymakers to quickly develop gross liabilities and rate asset structures. The Guariglia, Liu, & Song (2011) study has used data panels of 79,842 for companies in China during the period 2000 to 2007 have found that

the liquidity constraints have affected the growth of the company's assets. They found that the availability of internal finance for private firms and state-owned enterprises not affected by stand for a necessary constraint for the growth. Private firms refer to those operating in coastal regions, with negligible foreign ownership. However, these companies have grown very rapidly regardless of discrimination by financial institutions. Hence, a robust external capital market may not be used and needed for rapid economic growth. This research is expected that liquidity and asset efficiency will associate with the sustainable growth rate. The study by Sánchez-Vidal (2014) in Spain, a country that has a critical debt extends that problem to the public and private firms one of the factors influencing the firm's leverage in the country is that when these companies have disclosed important company information, especially those with high debt. The results of this study have shown that many factors are no longer important for high-end leveraged companies as well as critical companies in cash flow as those companies think about to reduce their debt levels. This study has used the OLS method in quantitative regression to analyze the determinant of leverage for large sample size companies for the period from 2001 to 2011 and depending on the level of corporate debt. Furthermore, this study has also found that problems with high leverage are not only important to new companies but also for older and larger companies. This is because, age and size will also give a positive and negative impact to the highest quantity. Also, companies that have tangible assets still cannot solve the high debt problem because tangible asset is not seen as a determinant. This research is expected that firm's size and asset efficiency will associate with the sustainable growth rate. Fonseka et al. (2012)has used 15,377 in its study and found that the firm's financial characteristics had a higher impact on sustainable growth. (Higgins, 1977)mentioned that more profitable firms have a higher sustainable growth rate due to an effective investment in fixed assets, efficient working capital management, and higher taxes. Johnson &Soenen (2003)found that profitable companies, having a certain degree of uniqueness in the business and having efficient capital management are the most successful companies in high sustainable growth. In addition, successful companies also have policy constraints and restraints on leverage and dividend policies are one of the key issues in corporate planning for a successful future growth. The study has anticipated that the tax rate will be linked to the company's sustainable growth rate.Hence in the present study an attempt is made to analyze the Actual Growth Rate(AGR) as well as Sustainable Growth Rate(SGR) and compare the differences between Actual and Sustainable Growth Rate of the selected companies.Examine the relationship between financial leverage, liquidity, and asset efficiency with sustainable growth rate (SGR). To see how the changes in firm size can affect sustainable growth rate (SGR); to measure the covariance between tax rate and sustainable growth rate (SGR); Lastly, to investigate the overall effect of all variables on sustainable growth rate (SGR).

Research Methodology

Simple random sampling technique is used to select the companies that are performing well in the Indian Stock market preferably stocks traded on Bombay Stock Exchange (BSE). Selected five companies belonging to oil refineries industry in India.

Name of the selected companies

1. Bharat Petroleum Corporation Ltd(BPCL)
2. Chennai Petroleum Corporation Ltd(CPCL)
3. Hindustan Petroleum Corporation Ltd(HPCL)
4. Indian Oil Corporation Limited(IOCL)
5. Reliance Industries Limited(RIL)

Objectives

The main objectives of the study are

1. Toanalyze the Actual Growth Rate(AGR) as well as Sustainable Growth Rate(SGR) of the selected companies.
2. Toexamine the relationship between financial leverage, liquidity, and asset efficiency with sustainable growth rate (SGR) and
3. To investigate the overall effect of selected variables on sustainable growth rate (SGR).

Hypotheses

H_1: There is a significant relationship between AGR and SGR.

H_2: There is a significant relationship between SGR and financial leverage.

H_3: There is a significant relationship between SGR and Asset efficiency.

H_4: There is a significant relationship between SGR and Liquidity.

H_5: There is a significant relationship between SGR and firm size.

H_6: There is a significant relationship between SGR and Tax rate.

Tools of Analysis

Internal or Actual Growth Rate (AGR) = ROA (1-DPR)

Where,

ROA=Return on Assets

DPR = Dividend Payout Ratio.

Sustainable Growth Rate (SGR)= ROE(1-DPR)

Where

ROE = Return on equity,

DPR = Dividend payout Ratio.

The SGR is a measure that firms for different purposes, such as to evaluate the creditworthiness of companies.If the actual growth rate in the sales of a company is greater than the SGR, financial institutions are prepared to advance loans to the company or to assist in the issue of shares in order to provide the capital needed.ifthe actual growth rate of sales is consistently lower than the SGR, the cumulative cash surpluses would need to be invested and the financial institution may offer investment products to the company (De Wet, 2004).

Model Specification

This study has used a linear regression method to find reliable empirical results. Thus, model equation used in this study is as follows:

$SGR(Y) = a_0 + b_1(DE)+b_2(CR)+b_3(ATR)+b_4(LNA)+b_5(TR)+e$

Table 1: Measurements of dependent and independent variables

Type	Variable	Indicator	Measurement
Dependent Variables	Sustainable Growth Rate (Y)	SGR	SGR = ROE (1 – DPR) ROE = Return on equity, DPR = Dividend payout ratio
Independent Variables	Financial Leverage (X_1)		
	Debt Equity Ratio	D/E	Total Debt / Total Equity
	Liquidity (X_2)	CA/CL	Current Assets / Current Liabilities
	Current Ratio		
	Asset Efficiency (X_3)	S/TA	Sales / Total Assets
	Total A sset Turnover		
Control Variables	Firm Size (X_4)	LNA	Natural log of Assets
	Tax Rate (X_5)	Tax	Effective tax rate

Analysis

Table 1.1: AGR and SGR values of selected companies during the study period 2007-08 to 2016-17

Year	BPCL		CPCL		HPCL		IOCL		RIL	
	AGR	SGR	AGR	SGR	AGR	SGR	AGR	SGR	AGR	SGR
2007-08	3.33	12.27	8.24	25.10	2.48	9.78	5.38	15.35	11.90	22.65
2008-09	1.00	3.98	0.00	0.00	0.84	3.70	1.56	4.63	5.45	11.70
2009-10	1.90	7.88	4.01	12.26	1.73	7.74	4.83	13.97	5.63	11.02
2010-11	1.86	7.40	2.71	8.84	1.75	8.48	2.95	9.28	6.28	12.25
2011-12	1.39	6.12	0.21	0.84	0.88	4.75	1.30	4.73	5.92	10.74
2012-13	2.75	11.10	0.00	0.00	0.80	4.49	1.56	5.73	5.76	10.26
2013-14	3.90	14.55	0.00	0.00	1.55	8.05	1.95	7.44	5.22	9.73
2014-15	4.96	15.39	0.00	0.00	2.81	11.88	1.66	5.40	4.97	9.15
2015-16	6.83	19.11	6.89	30.96	3.82	14.68	3.08	9.46	5.30	10.12
2016-17	3.78	11.74	8.43	29.27	4.17	16.08	3.30	8.58	0.00	0.00
r	0.975		0.978		0.991		0.985		0.994	

Interpretation: From the above Table 1.1, it is observed that the AGR values of selected companies are less than the SGR values throughout the study period.An Actual Growth Rate (AGR) below from Sustainable Growth Rate (SGR) implies that the company has more than enough capital to meet its investment needs and calls for an increase in liquid assets, a reduction in leverage, or an increase in dividend. During 2012-13 to 2014-15, the AGR and SGR values of CPCL are showing zero. This is happened because of no retained earnings out of profits during the study period. In case of RIL, in the year 2016-17 also observed retention ratio as zero. The coefficient of correlation between AGR and SGR of selected companies are more than 0.95 and nearer to 1. It indicates both AGR and SGR are having astrong positive relationship. Hence from Table1, It canbe conclude that all the selected companies are having sufficient capital to meet their growth opportunities in near future. These companies are no need to think about equity issuance or collecting debt from outside.

Table 2: Co-efficient of Correlation between SGR and related variables of selected companies during the study period 2007-08 to 2016-17

	SGR	DE	CR	ATR	LNA	TR
SGR	1.000					
DE	-0.278*	1.000				
CR	0.086	-0.337	1.000			
ATR	-0.165*	0.522	-0.329	1.000		
LNA	-0.079*	-0.436	0.193	-0.708	1.000	
TR	0.029	0.020	-0.365	0.295	0.029	1.000

Interpretation: From the above Table 2, it is observed that out of five independent variables, the dependent variable (SGR) is having asignificant relationship at 5% level of significance with three variables namely DE, ATR, and LNA. Remaining two variables namely CR and TR is having aninsignificant relationship with SGR. These results comply with other researchers(Lang, Ofek, & Stulz, 1996; Rajan & Zingales, 1998)found that there is a negative relationship between Sustainable Growth Rate(SGR) and Leverage(DE).

Table 3: Regression analysis between SGR and related variables of selected companies during the study period 2007-08 to 2016-17

SGR(Y) =57.731 -0.273(DE)**+0.017(CR)-0.436(ATR)**-0.516(LNA)**+0.185(TR)+e

R Square	Adjusted R Square	Std. Error of the Estimate	F-statistic	Sig.
0.196	0.133	7.13907	0.196	0.014

	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
(Constant)	57.731	15.461		3.734	0
DE	-2.747	1.392	-0.273	-1.973	0.053
CR	0.555	4.099	0.017	0.135	0.893
ATR	-0.039	0.017	-0.436	-2.296	0.025
LNA	-3.31	1.092	-0.516	-3.032	0.004
TR	0.094	0.068	0.185	1.379	0.173

a. Dependent Variable: SGRb. Predictors: (Constant), TR, DE, LNA, CR, ATR

Interpretation

From Table 3, it is observed that the relationship between DE, ATR, and size (LNA) with SGR has a significant relationship at the 5% level of significant (as the p-value< 0.05). However, CR and TR have an insignificant relationship with SGR (as the p-value> 0.01, 0.05 and 0.10).

The determination coefficient (R2) shows that only 13.3% of the relationship between the variance of sustainable growth rate and the variance of independent variable is liquidity, financial leverage, and management efficiency. In this case, there will be some more factors that can contribute to the effect on sustainable growth rate such as profitability and economic conditions (e.g. GDP and inflation rate). In F-test statistics, the null hypothesis for all regression coefficients less than 5% may be rejected at the 5% level of significant. These results comply with Fonseka et al.

Table 4: Hypothesis Analysis

Hypothesis	Statement	Impact	Decision
H_1	There is a significant relationship between AGR and SGR.	Positive	Accepted at 5% level of significance
H_2	There is a significant relationship between SGR and financial leverage.	Negative	Accepted at 5% level of significance
H_3	There is a significant relationship between SGR and Asset efficiency.	Negative	Accepted at 5% level of significance
H_4	There is a significant relationship between SGR and Liquidity.	Positive	Rejected at 5% level of significance
H_5	There is a significant relationship between SGR and firm size.	Negative	Accepted at 5% level of significance
H_6	There is a significant relationship between SGR and Tax rate.	Positive	Rejected at 5% level of significance

Interpretation: From Table 4 of hypothesis analysis it is clearly understood that financial leverage, Asset turn over and firm size is having asignificant relationship but affecting negatively. It means the more and more leverage, as well as Asset turnover, will affectcompany growth rate adversely. Hence it is inferred that all the selected companies are having sufficient capital to meet their growth opportunities in near future. These companies are no need to think about equity issuance or collecting debt from outside. It is already proved from Table 1.

Conclusion

From the analysis of the study, it is found that Debt-Equity ratio is having asignificant negative relationship with Sustainable growth rate. Too high leverage will cause the company to face problems especially in managing their debt. Chung et. al.(2013) in their study also proved and they claim that firms can survive and operate with persistently low leverage without being focused for acquisition including getting potential financing sources which this supports the pecking-order theory by using internal financing (retained earnings).SGR and firm size are also having asignificant negative relationship. Sánchez-Vidal (2014) study found that problems with high leverage are not only important to new companies but also for older and larger companies. This is because age and size will also give a positive and negative impact to the highest quantity.Therefore, companies are recommended to monitor and plan the level of leverage in managing their business as an important strategy so that their business grows sustainable in achieving bright future goals.

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Appendix

(a): Debt-Equity ratio of selected companies during the study period 2007-08 to 2016-17

Year	BPCL	CPCL	HPCL	IOCL	RIL
2008	1.29	0.71	0.71	0.86	0.46
2009	1.75	0.5	0.5	1.02	0.65
2010	1.7	1.18	1.18	0.88	0.49
2011	1.17	1.06	1.06	0.91	0.43
2012	1.42	0.9	0.9	1.22	0.36
2013	1.42	2.82	2.82	1.28	0.3
2014	1.03	3.17	3.17	1.22	0.43
2015	0.52	2.66	2.66	0.73	0.41
2016	0.5	1.55	1.55	0.57	0.38
2017	0.71	1.36	1.36	0.51	0.35

(b): Current ratio of selected companies during the study period 2007-08 to 2016-17

Year	BPCL	CPCL	HPCL	IOCL	RIL
2008	0.8	1.33	1.16	0.94	1.32
2009	0.55	1.21	1.05	0.73	1.3
2010	0.92	1.17	0.79	0.86	1.35
2011	0.82	1.03	0.85	1.01	1.36
2012	0.85	1.05	0.86	1.01	1.92
2013	0.9	0.91	0.88	1.03	1.73
2014	1.03	0.97	1.13	0.99	1.42
2015	0.93	0.72	1.16	0.99	1.27
2016	0.89	0.74	1.03	0.91	0.72
2017	0.79	0.82	0.95	0.86	0.7

(c): Assets turnover ratio of selected companies during the study period 2007-08 to 2016-17

Year	BPCL	CPCL	HPCL	IOCL	RIL
2008	255.91	267.05	250.88	211.22	89.11
2009	279.35	385.99	265.17	235.39	57.71
2010	221.32	236.83	207.65	184.28	76.45
2011	271.38	270.38	219.99	188.9	87.16
2012	323.09	272.64	250.79	189.87	111.77
2013	358.44	304.11	271.14	199.6	113.11
2014	359.06	353.9	287.8	188.11	106.13
2015	341.44	382.17	305.88	199.01	82.72
2016	249.11	252.27	254.81	154.71	50.93
2017	219.81	240.88	238.35	138.83	44.26

(d): Firm size of selected companies during the study period 2007-08 to 2016-17

Year	BPCL	CPCL	HPCL	IOCL	RIL
2008	10.67	9.26	10.64	11.67	11.92
2009	10.78	9.03	10.76	11.78	12.41
2010	10.90	9.27	10.85	11.89	12.43
2011	10.93	9.41	11.01	12.06	12.56
2012	11.09	9.61	11.17	12.25	12.60
2013	11.11	9.55	11.24	12.32	12.67
2014	11.19	9.54	11.26	12.44	12.81
2015	11.15	9.30	11.12	12.30	12.89
2016	11.24	9.24	11.16	12.33	13.03
2017	11.43	9.35	11.27	12.47	13.21

(e): Tax rate of selected companies during the study period 2007-08 to 2016-17

Year	BPCL	CPCL	HPCL	IOCL	RIL
2008	35.76	0.33	0.15	0.31	0.14
2009	48.86	0.00	0.32	0.37	0.06
2010	46.54	0.09	0.26	0.29	0.15
2011	25.48	0.28	0.18	0.15	0.17
2012	14.86	0.00	0.33	0.26	0.20
2013	29.07	0.00	0.18	0.15	0.20
2014	38.24	0.00	0.28	0.28	0.21
2015	27.11	0.00	0.24	0.16	0.21
2016	25.20	0.02	0.25	0.24	0.22
2017	20.01	0.23	0.25	0.28	0.20

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December 11-13, 2017
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Operational Excellence for Strengthening Customer Stickiness

Hariprasad Reddy K[1] and Devender Malhotra[2]

Abstract

Competition and dynamic business environments have made Operational Excellence (Opex) an essential part of organizational success. Opex goes beyond the traditional focus on process management, compliance, continuous improvement, and certifications to driving agility in execution with focus on improving process capability and people capability.Opex drive can deliver Flawless Executionwith enhanced customer experience. From considering customers only as a source of revenue, organizations today recognize them as the raison d'être of their business. They also realize that they need to build the business around the customer. Customers not only receive what an organization produces and delivers, but also directly and indirectly influence the operations and outcomes of an enterprise. It is for this that customer centricity is a bedrock of operational excellence.

Effective customer participation can increase the likelihood of his/her needs getting met while bringing in more customer benefits. This helps to maintain a continuous, strong win–win relationship with the customer. Analytics on customer feedback gives lot more insights to any organization and surfaces hidden challenges. These challenges could be the drivers for Opex Initiatives.

This paper discusses some of the patterns and insights of customer survey for an IT organization and highlights the importance of building analytical models for strengthening customer relationship.

1. Introduction

Today, all IT organizations are grappling with the triad of quality, speed, and cost amid global economic uncertainty. Organizations are putting in a lot of effort to improve operational efficiency. They are trying to identify areas that can protect their profit margins or simply survive in the global marketplace. However, most of these initiatives get buried in organizational complexity and fail to align with customer expectations. Regardless of the specific processes, tools, and methods an organization adopts and the Quality experts follows, it must become customer centric to gain a competitive edge.Businesses are now beginning to realize that a happy customer not only enhances profitability, but also serves as a reference for prospective clients and they are willing to build long-term relationships with their providers and to get more services. They have started to understand the importance of loyalty quotient. This is particularly important for

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B2B buyers since they consider peers as trusted sources of information. Such customer advocacy can be a positive differentiator and goes a long way in building trusted partnership.

2. Objectives of this Study:

Customer stickiness depends on many variables including operational parameters, customer relationship, usage of knowledgebase, project team competency etc. Detailed analytical studies are required to understand customer behavior and satisfaction levels. The main objectives of this study are applying analytical techniques for

1. Segmenting the customers based on their satisfaction levels
2. Predicting the customer satisfaction levels based on Operational Metrics
3. Correlation studies with operational parameters

3. Need of Analytics for enhanced customer experience

Creation of consistent customer experiences is a complex task. A recent Forbes article suggests that achieving customer centricity might require a deep cultural change. There needs to be a centralized effort to analyze data and search for patterns that will help gain a better understanding of customers. A seamless customer experience at every point of engagement is essential. This can often be a challenge as siloed efforts by individual divisions alienate rather than delight the customer. Formulation of a centralized strategy will enable alignment among various departments.

An organization's customer centricity strategy can be based on a few basic points:

Understanding the Customer: Given that customers today need individual attention and can no longer be grouped into vague segments, it is essential to understand their varying needs. Companies should use the best possible tools and techniques to create quantifiable and actionable insights into customer behavior. Such tools include cutting-edge data analytics, customer tracking, etc.

Decision Making Process: Strategic decision making should be centered on customer experience management. One must analyze the impact of all decisions on customer perception of one's products and services and gauge customer satisfaction in accordance with that.

Organizational Culture: Customer-focused practices must be institutionalized across the organization. Customer-facing employees should be sensitized to the fact that all customer engagement channels need to be seamlessly integrated. One must secure employee buy-in for customer-centricity initiatives and train them as and when required.

Delivering Insights: The organization should be able to draw insights from the available customer information and also predict future service behavior. Data scientists should derive correlations between customer information and operational parameters to understand the critical variables that impact customer success. It can then deliver value-added business solutions that are aligned to customer needs, and hence generate business value.

3.1 Customer segmentation using cluster analysis:

Cluster analysis is a simple statistical technique which will identify similarities based on the available data and group them into different segments. Cluster analysis is used to understand different segments of customers based on the given feedback by customers on various parameters like Loyalty, Value for Money, Overall satisfaction etc. This has given a clear direction for the management to arrive at different strategies to improve the satisfaction levels. As indicated in the following chart the differentiating factor between cluster 3 and cluster 2 is Value Add.

Similarly the variation (gap between he clusters) in the value Add parameter is a clear indication that ValueAdd is one of the differentiating parameters between different customer segments. In comparison to Value Add parameter, meeting commitments has highest weightage as the differentiating factor between cluster 4 and cluster 3. One can draw many such inferences by studying this chart.

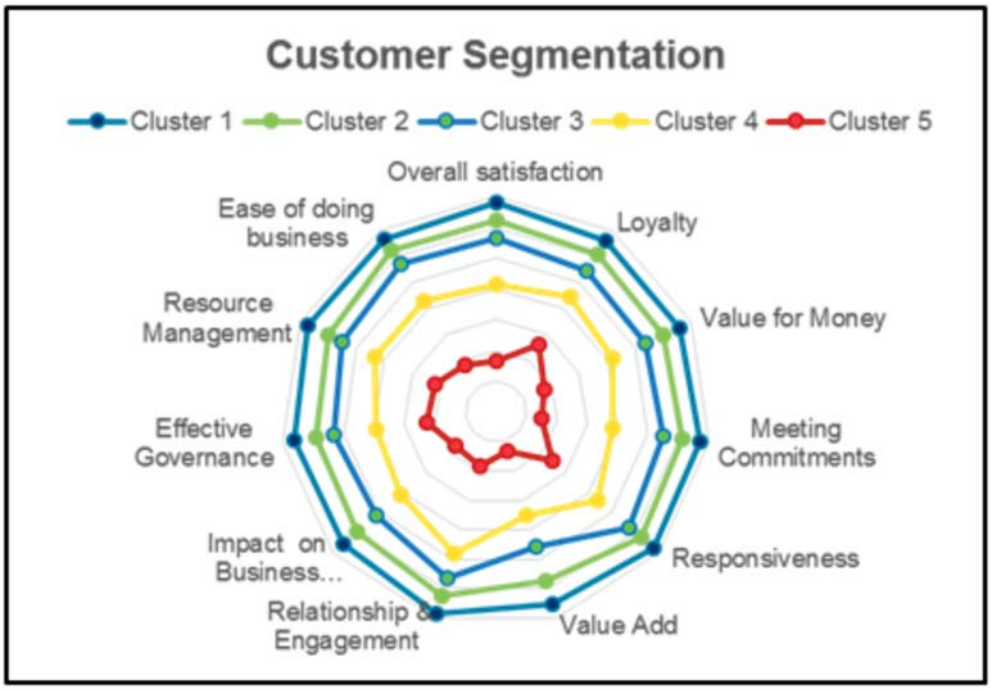


Figure 1: Customer segmentation using cluster analysis (source: based on author's own analysis)

3.2 Classification and Regression Tree (CART) Model for Predicting Customer Satisfaction levels

CART is one form of Decision Tree algorithms that can be used for classification or regression predictive modeling problems. The representation for the CART model is a binary tree.Each root node represents a single input variable (x) and a split point on that variable (assuming the variable is numeric).The leaf nodes of the tree contain an output variable (y) which is used to make a prediction.

Based on the available Operational parameters like quality of deliverables, Schedule adherence, Service level agreements, team composition etc. binary decision tree can be created for customer satisfaction levels. Once the decision tree is created then prediction will be simple and by tracing through the splits based on the new operational parameters for any new engagement, one can predict the customer satisfaction levels. Skeleton CART model is indicated here.

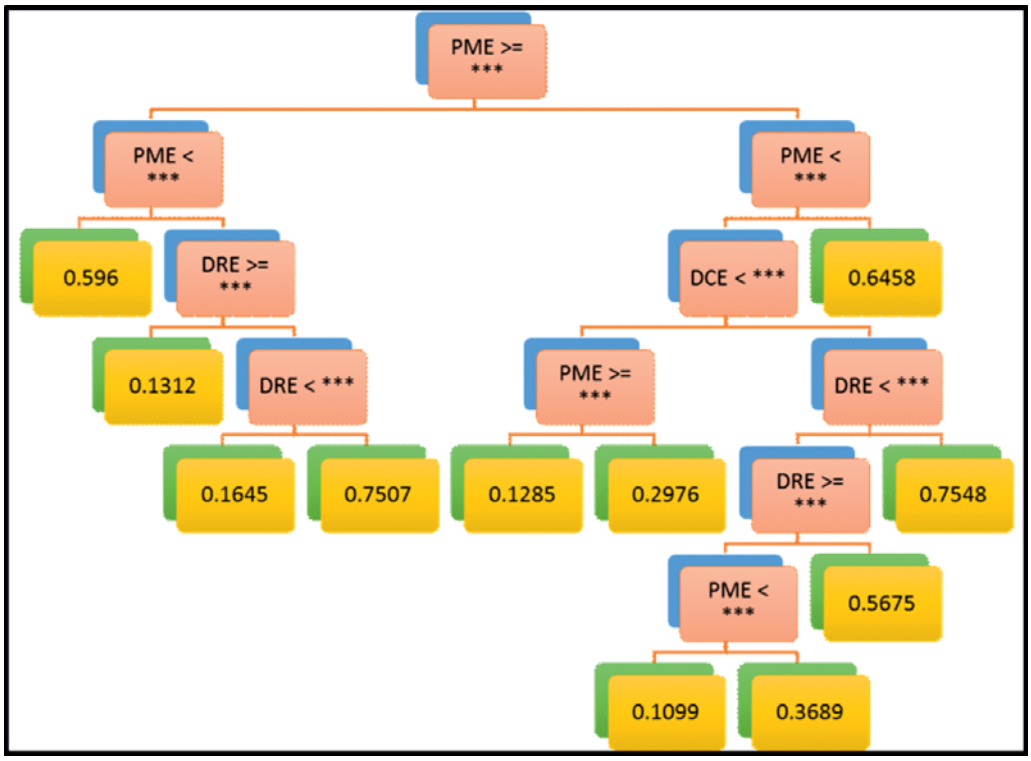
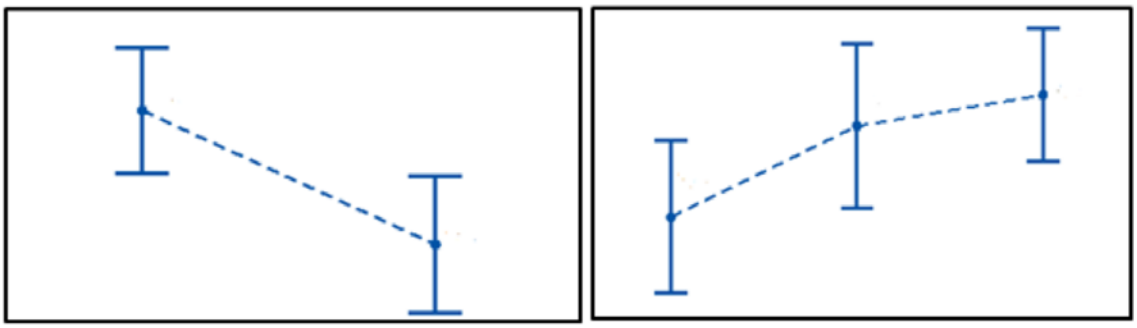


Figure 2: CART Model (source: based on author's own analysis)

* Due to confidentiality reasons actual data and variable names are masked

3.3 Inferential statistics to understand the correlations

Statistical techniques like regression, ANOVA, ANOM etc. are helpful in understanding the underlying patterns and significant factors that impact the customer satisfaction levels. In any analytical studies this should be the first step to understand the correlations. Typically these studies will be carried out one factor at a time initially and then based on the results analysts can apply next level of analytical techniques to study the interaction effects (compounded effect of multiple variables) on customer satisfaction levels.



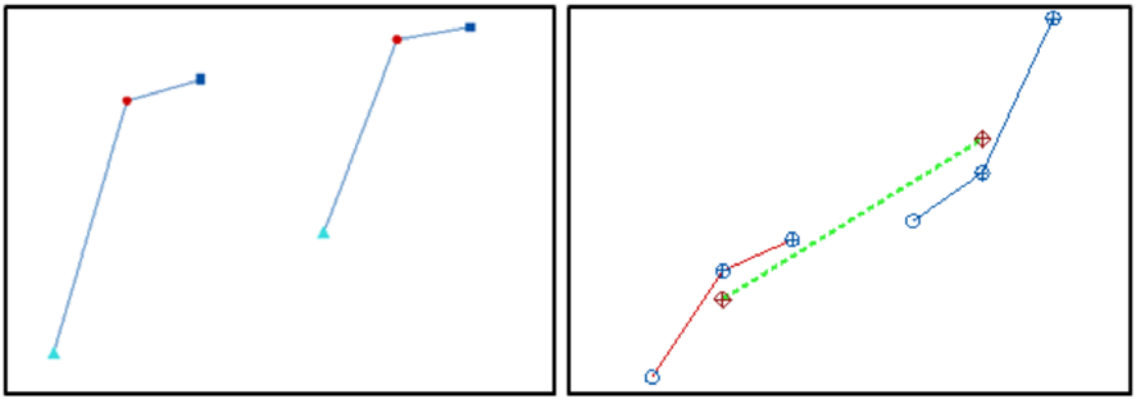


Figure 3: Identification of variables based on Correlations source: based on author's own analysis)

* Due to confidentiality reasons actual data and variable names are masked

4. Summary

Analytics of customer satisfaction and delivery performance eliminates the perception of stakeholders about opex parameters and their impact on customer satisfaction levels. This leads to data based decision making and ensures different strategies for different segments of customers. These insights help the organization to evaluate the current excellence initiatives and lead to new areas to focus.

Proceedings of GLOGIFT 17
December 11-13, 2017
Delhi School of Management, Delhi Technological University, Delhi
pp. 63-83

Modeling Enterprise Flexibility and Competitiveness for Indian Pharmaceutical Firms: A Qualitative Study

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Abstract

Given the challenges posed by today's VUCA (Volatile Uncertain Complex and Ambiguous) world, organizations are required to be highly flexible in order to survive and remain competitive. Such a need is more pronounced in the dynamic context of the pharmaceutical industry, especially in India, which has witnessed tremendous change in the last several years. This makes it imperative to explore as to how pharmaceutical firms in India are addressing the issue of flexibility and its consequent linkage with their competitiveness, by undertaking a qualitative study to structurally model their inter-relationship.

After providing a conceptual review of flexibility and competitiveness, this paper adopts the use of a qualitative approach called the Total Interpretive Structural Modeling (TISM). TISM is an innovative version of Warfield's interpretive structural modeling technique and is used to model and structure the various types of enterprise flexibility and competitiveness for greater understanding of the interplay of these factors. In the end, the implications for practitioners and researchers are highlighted.

Keywords: Enterprise Flexibility, Competitiveness, Total Interpretive Structural Modeling, Interpretive Structural Modeling, Pharmaceutical Industry.

1. Introduction

Global business environment had never been so volatile, uncertain and complex as it is today. To cope up with the challenges of such a world, business organizations are recalibrating their strategies to survive and remain competitive. This, however, calls for redefining the capability requirements of the organization and aligning them to their corporate strategies. Studies in the past have emphasized formulating dynamic and competitive strategies using flexible mechanism (Sushil, 2015), in order to remain competitive as well as to face the turbulence and vulnerabilities of environment.

Researches in the past have highlighted the significance of flexibility for the organization to grow in fast changing and even turbulent environments (Dreyer and Gronhaug, 2004). When organizations use real time information to support their business processes, incorporation of flexibility and adaptability in the system becomes necessary (Davidson, 1999). Flexible organizations dominate the business processes which are incorporated end-to-end, which in turn enable it to respond to flexibility and speed to meet customer demands, market opportunities and to face external threats (Sethi and Sethi, 1990; Shi and Daniels, 2003).

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Thus, to survive in the rapidly changing business environment of today, organizations are required to be highly flexible (Passmore, Shea and Horney, 2010). This prompted us to explore as to how the organizations are addressing the issue of flexibility and its consequent linkage with the competitiveness. This paper, thus, presents a hierarchical modeling of the constructs of enterprise flexibility and competitiveness.

An attempt is made to explore the dimensions of enterprise flexibility and competitiveness in the pharmaceutical sector. Based on the review of literature, variables/dimensions affecting competitiveness have been identified. These factors are then modeled using a qualitative tool called Total Interpretive Structural Modeling (TISM) based on the inputs from the experts of pharmaceutical industry in India. At the end of the paper, the implications for practitioners and researchers have been outlined.

2. BACKGROUND LITERATURE

The review of literature is undertaken on themes like flexibility, competitiveness and the context of pharmaceutical industry, as explained in the section below.

2.1 Flexibility

Flexibility is defined as "a ready capability to adapt to new, different or changing requirements" (Webster's Dictionary). According to Volberda (1996), "Flexibility is the degree to which an organization has a variety of managerial capabilities and the speed at which they can be activated, to increase the control capacity of management and improve the controllability of the organization." Thus, flexibility is a complex initiative which is multi-dimensional in nature, demanding, versatile, change oriented, sustainable and has the ability to develop over time (Bahrami, 1992).

Flexibility is indispensable in effectively operating in the new, dynamic competitive landscape. It is an attribute that forces the firm's capability to react rapidly according to the changing and dynamic business environment (Evans, 1982; Suarez, *et. al*., 1991; Hitt, *et. al*., 1998; Rindova and Kotha, 2001; Grewal and Tansuhaj, 2001). Therefore, the demand to enhance flexibility options can be met by developing an inventory of choices which seems to be significant for the competitiveness, particularly of high technology firms (Bahrami, 1992), as flexibility offers a competitive advantage over other enterprises.

Traditionally, flexibility intends to focus on the firm's ability to adjust their manufacturing level to meet the fluctuating market demand. However, more recently, the idea of flexibility has been extended to integrate firm's ability to widen their product range, expand market share, and enter new markets (Dreyer and Gronhaug, 2004).

Flexibility, thus, is a key capability, as it is imperative for any organization to have alternatives which help them to handle the dynamic situations (Sushil, 2001). Organizations should be flexible enough with respect to different dimensions to remain competitive, which include flexibility in functional areas like finance, marketing, strategy etc., giving importance to different types of flexibility, which is explained in the next section.

2.1.1 Types of Flexibility

This section presents types of flexibility in an organization which can be Enterprise, Strategic, Financial, Organizational, Manufacturing, Marketing and Information systems flexibility.

***Enterprise Flexibility*:** "Enterprise flexibility means creating options at different levels in the enterprise, creating ways and methods of change across the range of options, and providing freedom of choice to various actors in the enterprise to make this change happen with minimum time and efforts" (Sushil, 2014).

As discussed earlier flexibility offers competitive advantage to organizations. So the term enterprise flexibility can be defined as the capability of enterprise to bend according to the changing demands of environment and its stakeholders by taking less time and effort (Sushil, 2006). Flexibility can be easily achieved by satisfying the requirements of emerging situations. Also, the systems and the information technology infrastructure which support these processes should change easily.

The different types of enterprise flexibilities are: Strategic flexibility connected with strategic dimension; organizational flexibility connected with structure and people dimensions; and flexibility of various types of systems, such as financial, information, manufacturing, marketing, technology management, and so on (Sushil, 2001).

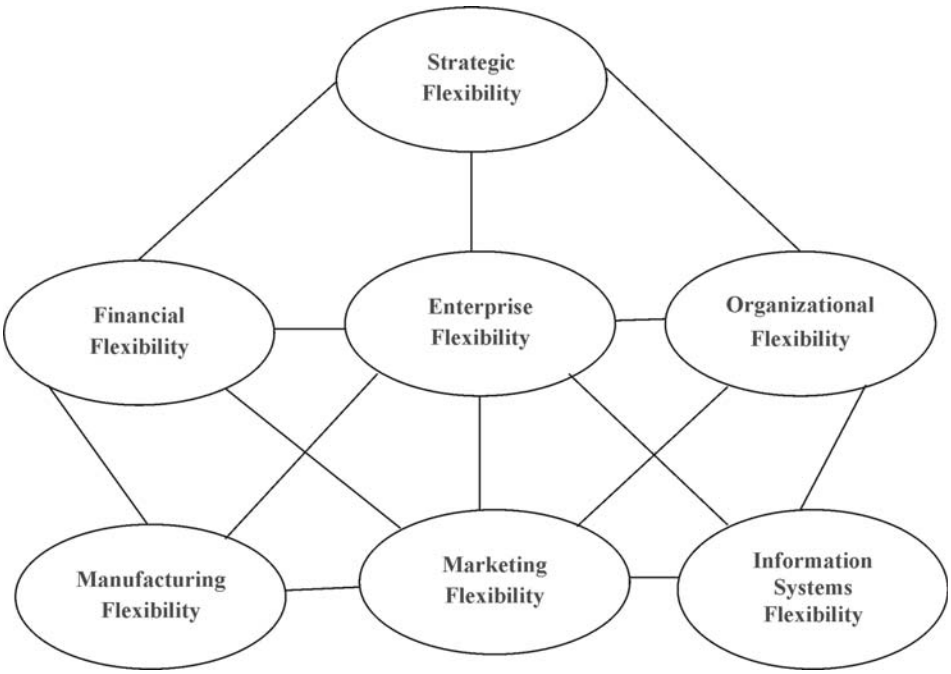


Figure 1: Components of Enterprise Flexibility (Source: Sushil, 2014)

Enterprise flexibility is favored so as to adjust to the quick pace of transformation in business environment. Flexibility in the enterprise should be created in a manner so that controllability also increases. A highly open system with lack of controls may lead to a disordered enterprise. Thus, Flexibility in various domains such as strategy, structure, systems and people should be created in a way so that it provides adaptiveness and receptiveness without losing controllability. The choices that are created within the area of the enterprise create internal flexibility, where as the options outside the enterprise in the rest of the value network create external flexibility. A right balance of external and internal flexibility is to be kept up for a high performing enterprise (Sushil, 2014).

***Strategic Flexibility*:** Strategic flexibility is a process that has an impact on the company, by virtue of the requirement instead of option, is used to denote the company's deliberate or emergent capabilities for offensive or defensive maneuver. Strategic flexibility means that the company change the way according to their needs.

Strategic flexibility offers transformational ability regarding continuous renewal of the organization and dynamic balancing of the incomprehensible key choices. This provides openness, focus, change, and flexibility in the strategy formulation and execution like a flowing stream strategy (Sushil, 2014). It is closely linked to environmental uncertainty because when the external environment becomes more volatile, enterprises require greater flexibility in order to respond to the challenging conditions.

Teece, Pisano, and Shuen (1997) emphasized that organizations should depend on dynamic potentials to build competitive advantage in times of rapid change. Researchers like Sanchez (1995) and Garud and Kotha (1994) suggested that strategic flexibility facilitates the organizations to compete successfully under such circumstances (Abbott, 2003).

***Financial Flexibility*:** It can be defined as an exercise of freedom of choice within the framework of Government monetary and fiscal policy, capital market regulations, investors' risk-return preferences, and corporate strategy to develop the financial processes with adaptability and transparency so as to have better boom with the business environment. The purpose of financial flexibility is to create more money related choices and change over these choices under turbulence to enhance budgetary execution and minimize danger.

***Organizational Flexibility*:** The organizational flexibility is the capability of the organization to initiate change along with continuity in its structure, processes, people, and culture, so as to pursue many alternatives on the same continua and at the same time and to dynamically interplay across the organizational options.

The main purpose of organizational flexibility is to offer learning, readiness for change and adaptation for organizational transformation. The need for organizational flexibility to accommodate a changing world is well understood. The high velocity and competitive markets has added immense pressure among the organizations to change rapidly along with achieving the desired performance parameters.

***Manufacturing Flexibility*:** The manufacturing flexibility is the potential of the manufacturing systems in the organization to change or adjust to both outside and inside conditions with minimum time and efforts (Sharma and Sushil, 2002). The need to have manufacturing flexibility is to ensure that the required quantity as per customers changing demands should be manufactured with agility and at a minimum cost and by this competitive advantage is achieved by reducing the cycle time.

***Marketing Flexibility*:** According to Abbot and Banerji (2003), marketing flexibility enable organizations to have a larger market share or a stronger market presence. It is, further, defined as the ability of firms to adjust its marketing efforts in response to changing environmental context.

***Information Systems Flexibility*:** The information system flexibility is the ability of the information system to change and modify according to the requirements of new conditions, demands, or circumstances both within and outside the enterprise. It is composed of both systemic flexibility (flexible for organization requirements) and usage flexibility (flexible for usage) (Palanisamy and Sushil, 2003; Palanisamy, 2012). The aim of Information systems flexibility is to ensure that the information system are more dynamic, information escalated and intelligent to enable organizational change and generate competitive advantage.

The table below presents a list of various types of enterprise flexibility, used for this study:

Table 1: Types of Enterprise Flexibility

Type of Flexibility	Author (Year)	Description
Strategic Flexibility	Sanchez (1995), Sushil (2005)	Firms ability to respond to different demands from dynamic competitive environments in an aggressive way. Strategic Flexibility is firmly connected to environmental uncertainty.
Financial Flexibility	Jain and Sushil (2000)	Financing flexibility is a practice of the opportunity of decision to progressively interchange among the different wellsprings of (i) Finance (ii) suppliers of assets and (iii) various financial instruments. • Flexibility in financial strategies, open to interplay from dilution to enhancement of EPS and profitability is likely to help in creating financing flexibility.
Organizational Flexibility	Volberda (1996), Sushil (2000)	It dynamically balances the opposing phenomenon such as centralization-decentralization/continuity change. Flexibility derives fro m the accumulation of managerial capacities (organization challenge) and the responsiveness of the organization (organization design challenge). On the premise of speculations of control, the author argues that organizational flexibility is inherently paradoxical and requires a productive contact amongst change and conservation.
Manufacturing Flexibility	Sharma and Sushil (2002)	Capacity of the manufacturing systems to change or ad just to both external and internal conditions with least time and efforts.
Marketing Flexibility	Grewal and Transtutaj (2001), Abbot and Banerji (2003)	Capacity to have a high market share/strong market presence. Market flexibility is characterized as the capacity of Transnational Corporations to recalibrate its promoting endeavors in a short period in response to changing environmental context.
Information Systems Flexibility	Palanisamy and Sushil 2003	Capacity of the information systems to change or to alter and adjust because of new conditions, demands, or circumstances both inside and outside the enterprise. It is made out of both systemic flexibility (flexible for organization requirements) and usage flexibility (flexible for usage).

Source: Adapted from Sushil, Sharma, and Jain (2010)

2.2 Competitiveness

In the present economic scenario the organizations are experiencing intense pressure which is mainly due to factors like fast changing business environment, shorter product life cycle, increasing demand from less loyal customers whose preferences evolve quickly and rising competitors (Dreyer and Gronhaug, 2004). These concerns have been brought on basically because of a changing global economy, deregulation in several ventures and fast developments in information technologies that permits the opening of new business models which increases business rivalry. As discussed in the previous sections, flexibilities of different kinds contribute towards enhancement of organizational competitiveness.

The term 'Competitiveness' has originated from the Latin world, 'competer', which means involvement in a business rivalry for markets. In business parlance, the term implies the ability to compete. It is a complex, multidimensional and relative concept which is linked to various interdependent variables, making it difficult to sense and define it. The task of defining and measuring competitiveness is itself a research challenge; though it is a familiar idea without having any immediate relationship with economic performance indicators.

Competitiveness has been framed by joining two separate but related concepts, namely, comparative advantage and competitive advantage. Competitive advantage relates to the concept of firm's assets and describes the proprietary elements that clarify what activities it should commence which will distinguish it from its competitors (Porter, 2001). The actual difference between these two terms in the literature seems to depend on their levels of assessment. While the research on comparative advantage explains that it deals with the issue of competitiveness of nations and their industries, researchers of competitive advantage are more concerned with firm level (Porter, 1985).

Competitiveness is a multidimensional concept which can be looked at from three different levels: country, industry, and firm level.

Country Competitiveness: Country Competitiveness refers to the degree to which a country' environment is helpful for business and industry. Most of the country competitiveness reports modify some variation of this definition and measure competitiveness completely regularly on more than 250 criteria of competitiveness.

Industry Competitiveness: Industry Competitiveness is the combined capability of firms in the industry to compete internationally. Performance measures such as productivity are great surrogates of competitiveness for speedy evaluation.

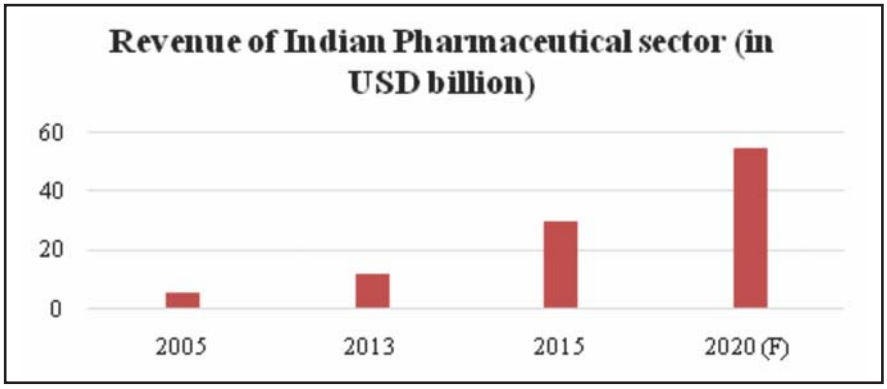
Competitiveness at Firm Level: Competitiveness of a firm is the ability to attempt any or all activities on the value system from imagining, planning, designing, engineering, manufacturing, marketing, financing to servicing of a product or service or bundle of products and services, superior to those offered by competitors considering the price or non price quality on a sustained basis.

2.3 Pharmaceutical Industry in India

India enjoys an important position in the global pharmaceuticals sector. Indian pharmaceutical sector accounts for about 1.4 per cent of the global pharmaceutical industry in value terms and 10 per cent in volume terms. This makes the Indian pharmaceuticals market is the third largest in terms of volume and thirteenth largest in terms of value. The Indian pharmaceuticals market increased at a CAGR of 9.4 per cent in 2013 from USD6 billion in 2005, and is expected to expand at a CAGR of 23.9 per cent to USD55 billion by 2020. By 2020, India is likely to be among the top three pharmaceutical markets by incremental growth and sixth largest market globally in absolute size. India has a huge market potential for Pharmaceuticals. Indian pharmaceutical industry is famous in international fraternity for making medicines at comparatively low-price. India's cost of production is significantly lower than that of the US and almost half of that of Europe. It gives a competitive edge to India over others.

India has also maintained its lead over China in pharmaceutical exports with a year-on-year growth of 7.55 per cent to US$ 12.54 billion in 2015, according to data from the Ministry of Commerce and Industry. Overall drug approvals given by the US Food and Drug Administration (USFDA) to Indian companies have nearly doubled to 201 in FY 2015-16 from 109 in FY 2014-15, an increase of 84 per cent as per analysis by USFDA.

Figure 2: Revenue of Indian Pharmaceutical Sector



Source: Department of Pharmaceuticals, PwC, McKinsey, Aranca Research, F= Forecast

The Indian pharmaceutical industry is fragmented with more than 10,000 manufacturers in the organised and unorganised segments. The products manufactured by the Indian pharmaceutical industry can be broadly classified into bulk drugs (active pharmaceutical ingredients - API) and formulations (Figure 2). Of the total number of pharmaceutical manufacturers, about 77% produce formulations, while the remaining 23% manufacture bulk drugs. Bulk drug is an active constituent with medicinal properties, which acts as basic raw material for formulations. Formulations are specific dosage forms of a bulk drug or a combination of bulk drugs. Drugs are sold as syrups, injections, tablets and capsules.

The Indian API manufacturing segment is divided into two sectors – innovative or branded and generic or unbranded. In 2009, the global generic drug market was estimated to be US$ 84 billion, of which the US accounted for 42%. India's generic drug industry is estimated to be US$ 19 billion and it ranks third globally, contributing about 10% to global pharmaceutical production.

3. MODELING ENTERPRISE FLEXIBILITY AND COMPETITIVENESS

Total Interpretive Structural Modeling (TISM) technique has been used to explore the inter-relationships among the various types of enterprise flexibility and competitiveness.

Based on literature review, the micro constituents/factors of enterprise flexibility have been identified as a part of a doctoral research conducted in Indian context. A list of these variables and their description is provided in Table 2. Though these variables form the basis of the criteria and indicators for competitiveness in the pharmaceutical firms in India, a structural analysis of how various factors of enterprise flexibility interact or affect competitiveness can bring greater clarity, given the complexity of the situation.

The stepwise method adopted for modeling the variables using the TISM technique has been illustrated in the subsequent sections. The elements, contextual relation and interpretation of enterprise flexibility and competitiveness for the pharmaceutical firms in India are summarized in Table 3.

3.1 Variables of Enterprise Flexibility

A brief explanation of the micro variables of enterprise flexibility and competitiveness, as identified from the literature, are summarized in Table 2.

Table 2: List of identified Variables of Enterprise Flexibility and Competitiveness

S. No.	Variable	Micro/ Macro Variable	Description	References
1	Enterprise Flexibility	Macro	Ability of enterprise to adapt to changing requirements of its environment and its stakeholders with minimum time and effort	Sushil (2001a), Sushil (2006), Sushil (2014)
2	Strategic Flexibility	Micro	Firms ability to respond to different demands from dynamic competitive environments in an aggressive way	Sanchez (1995), Sushil (2005)
3	Financial Flexibility	Micro	Create more money related choices and change over these choices under turbulence to enhance budgetary execution and minimize danger	Jain and Sushil (2000)
4	Organizational Flexibility	Micro	Change making capability of the organization in its structure, processes, people, and culture	Volberda (1996), Sushil (2000)
5	Manufacturing Flexibility	Micro	Ability of the manufacturing systems to change or adapt to both external and internal conditions with minimum time and efforts	Sharma and Sushil (2002)
6	Marketing Flexibility	Micro	Capability to cater to changing customer needs, handling multiple mar ket segments, and balancing global and local requirements to gain sustainable competitive advantage	Grewal and Transtutaj (2001), Abbot and Banerji (2003)
7	Information Systems Flexibility	Micro	Capacity of the information systems to change or to alter an d adjust because of new conditions, demands, or circumstances both inside and outside the enterprise	Palanisamy and Sushil (2003), Palanisamy (2012)
8	Competitiveness	Macro	Ability of the firm to offer products or services superior to those offered by the competitors considering the price or non price quality on a sustained basis	Porter (1985,1990,200 1), Hamel and Prahlad (1993), Momaya (2000,2003)

Identification of structure within a system i.e. identifying relationships among the variables can be of great value in dealing effectively with the system and better decision–making. Total Interpretive Structural Modeling (TISM), a qualitative tool- which is an improved version of Interpretive Structural Modeling (ISM) (Nasim, 2011)- has been used to model and structure the various types of enterprise flexibility and competitiveness for greater understanding of the interplay of these factors. Expert's inputs about the possible relationship among the factors have been taken to develop the model. An introduction to the methodology of TISM, and the structural model and the interpretation for the study is discussed in the following sub-sections.

3.2 Introduction to TISM (Total Interpretive Structural Modeling)

Structural models may include interaction matrices and graphs (Warfield, 1973a, b, 1974b); Delta charts; signal flow graphs, etc., which lack an interpretation of the embedded object or representation system. An interpretive structural model (ISM) deals with the interpretation of the embedded object or representation system by systematic iterative application of graph theory resulting in a directed graph for the complex system for a given contextual relationship amongst a set of elements. Interpretive structural modeling, can therefore, be defined as a process that transforms unclear and poorly articulated mental models of systems into visible and well–defined models useful for many purposes.

In any Interpretive Structural Model (ISM), the interpretation of the diagraph can be done at two levels, i.e. nodes and links. An ISM interprets the nodes in terms of the definition of elements. But the interpretation of links is comparatively weak in ISM; this is limited to interpreting the contextual relationship between the elements and the direction of relationship in a paired comparison. But the interpretation of the directed link in terms of how it operates is lacking (Sushil, 2009). For example, two objectives A and B are related by the contextual relationship 'will help achieve'. If there is a directed relationship in an ISM from objective A to objective B, thereby implying that objective A is helping to achieve objective B, it does not interpret that in what way objective A is helping to achieve objective B. This weakness of ISM methodology has been addressed by Sushil (2009), whose framework and methodology of Total Interpretive Structural Modeling (TISM) interprets the links in the interpretive structural models using the tool of Interpretive Matrix (Sushil, 2005a).

Thus, TISM is essentially an innovative version of Warfield's (1973, 1974) Interpretive Structural Modeling (ISM) technique (Nasim, 2011) and is used to model/structure the various types of enterprise flexibility and competitiveness for greater understanding of the interplay of these factors.

3.3 Methodology Adopted for Modeling (TISM)

The framework and methodology of Total Interpretive Structural Modeling (TISM) is used to delineate the hierarchical relationships among the micro variables of enterprise flexibility and competitiveness for the pharmaceutical firms in India.

Opinion from a group of select domain experts has been taken to evolve the model. The central tool of ISM, i.e. reach ability matrix and its partitions is adopted as it is in the process of TISM. The basic process of TISM is discussed in a step-by-step manner and these steps along with the matrices and other tools are illustrated using the variables of 'enterprise flexibility' for which the TISM is conducted.

Step I: Identify and Define Elements

The first step in any structural modeling is to identify and define the elements whose relationships are to be modeled. This can be done by using any idea generation method as a small group exercise or may also be related with past studies if such information is available. For the study, the micro variables of enterprise flexibility, as identified from the literature, have been used to identify their inter-relationship with competitiveness.

Step II: Define Contextual Relationship

In order to develop the model of the structure relating the elements, it is crucial to state the contextual relationship between the elements. For example the contextual relationship between different elements (different types of enterprise flexibility and competitiveness) as identified for

the study is factor V1 influence/enhance factor V2 and factor V1 influence/enhance factor V7. Expert inputs are solicited to capture the contextual relationship among the elements.

Step III: Interpretation of Relationship

This is the first step forward over the traditional ISM. Though ISM, too, captures the contextual relationship, it remains silent on how that relationship really works. Thus, in order to interpret the ISM further to make it TISM, it is advisable to seek clarification from the experts the interpretation/logic behind the expressed relationship as illustrated in Table 2. That is, experts not only indicate whether strategic flexibility (V1) influence/enhance financial flexibility (V2) or not, but also explain, "In what way do they influence/ enhance?" The interpretation of the relationship would be specific for each pair of variables of enterprise flexibility and would make the deep rooted knowledge explicit by capturing the logic from the experts. The basic sets of elements considered for the study, contextual relationship and interpretation of the relationship are summarized in Table 3. The template prepared and used for seeking inputs from the expert(s) to understand the possible inter-linkages/relationships between the various types of enterprise flexibilities and competitiveness is presented in Appendix I. The list of experts used for filling up the template is also included in the Appendix I.

Table 3: Elements, Contextual Relationship and Interpretation for Enterprise Flexibility and Competitiveness

Element code	Elements	Contextual Relation	Interpretation
V1	Strategic flexibility	Factor V1 will influence/enhance Factor V2	How or in what way Factor V1 will influence/enhance Factor V2
V2	Financial flexibility		
V3	Organizational flexibility		
V4	Manufacturing flexibility		
V5	Marketing flexibility		
V6	Information Systems flexibility		
V7	Competitiveness		

Step IV: Interpretive Logic of Pair-wise Comparison

In ISM, the elements are compared to develop SSIM, as described previously. The only interpretation that is made here relate to the direction of the relationship. In order to upgrade it to TISM, it is proposed to make use of the concept of interpretive matrix so as to fully interpret each paired comparison in terms of how that directional relationship operates in the system under consideration by answering the interpretive query as mentioned in step III. For paired comparison, the *ith* element is compared individually to all the elements from *(i+1) th* to the *nth* element. If there are *n* elements, there will be in all *n(n-1)/2* paired comparisons. Since each pair of elements *(i,j)* may have two possible directional links *i-j* or *j-i,* there will be in all *n(n-1)* rows in the Knowledge Base. For each *i-j* link the entry could be 'Yes(Y)' or 'No(N)' and if it is 'Yes', then it is to be further interpreted. This will reveal the interpretive logic of the paired relationships in the form of 'Interpretive Logic - Knowledge Base'. This is illustrated in the template used to capture the response of the experts regarding relationship between the various types of enterprise flexibilities and competitiveness as attached in Appendix I.

Step V: Reachability Matrix and Transitivity Check

The paired comparisons in the interpretive logic – knowledge base are translated in the form of reach ability matrix by making entry 1 in *i-j* cell, if the corresponding entry in knowledge base

is 'Y', or else it should be entered as 0 for the corresponding entry 'N' in knowledge base. This matrix is checked for the transitivity rule and no significant transitive link was found.

Step VI: Level Partition on Reachability Matrix

The level partition is carried out similar to ISM to know the placement of elements level-wise (Warfield, 1974c; Saxena, Sushil and Vrat, 2006). Determine the reach ability and antecedent sets for all the elements. The elements in the top level of the hierarchy will not reach any elements above their own level. As a result, the reach ability set for a top level element will consist of the element itself and any other elements within the same level which the element may reach, such as components of a strongly connected sub-set. The antecedent set for a top level element will consist of the element itself, elements which reach it from lower levels, and any element of a strongly connected sub-set involving in the top level. As a result, the intersection of the reach ability set and the antecedent set will be the same as the reach ability set in case the element is in the top level. The top level elements satisfying the above condition should be removed from the element set and the exercise is to be repeated iteratively till all the levels are determined (Refer to Tables 5a – 5g).

Step VII: Developing Diagraph

The elements are arranged graphically in levels and the directed links are drawn as per the relationships shown in the reach ability matrix. A simpler version of the initial diagraph is obtained by eliminating the transitive relationships step-by-step by examining their interpretation from the knowledge base (Figure 3).

Step VIII: Interaction Matrix

The final diagraph is translated into a binary interaction matrix form depicting all the interactions by 1 entry (Exhibit 3a). The cells with 1 entry are interpreted by picking the relevant interpretation from the knowledge base in the form of interpretive matrix.

Step IX: Total Interpretive Structural Model

The connective and interpretive information contained in the interpretive direct interaction matrix and diagraph is used to derive the TISM. The nodes in the diagraph are replaced by the interpretation of elements placed in boxes. The interpretation in the cells of interpretive direct interaction matrix is depicted by the side of the respective links in the structural model. This leads to total interpretation of the structural model in terms of the interpretation of its nodes as well as links, as depicted in Figure 5.

3.4 TISM for Enterprise Flexibility and Competitiveness

As indicated earlier, the total interpretive structural model (TISM) has been developed to explore the relationships among the micro variables of enterprise flexibility and competitiveness for the pharmaceutical firms in India. In this section, the reach ability matrix (Table 4), the matrices for partitioning the variables into various levels (Table 5a – 5g), the diagraph depicting the relationship among the nodes (Figure 3), the ISM in Figure 4 and the final TISM (Figure 5) is presented, followed by a discussion on the relationships identified.

Table 5a: Partitioning the reach ability matrix into different levels (Iteration-1)

Factors	Reach ability set	Antecedent Set	Intersection Set	Level
V1	1,7	1,2,3,4,5,6	1	
V2	1,2,7	2,3,6	2	
V3	1,2,3,4,5,7	3,6	3	
V4	1,4,7	3,4,6	4	
V5	1,5,7	3,5,6	5	
V6	1,2,3,4,5,6,7	6	6	
V7	7	1,2,3,4,5,6,7	7	I

Table 5b: Partitioning the reach ability matrix into different levels (Iteration-2).

Factors	Reach ability set	Antecedent Set	Intersection Set	Level
V1	**1**	**1,2,3,4,5,6**	**1**	**II**
V2	1,2	2,3,6	2	
V3	1,2,3,4,5	3,6	3	
V4	1,4	3,4,6	4	
V5	1,5	3,5,6	5	
V6	1,2,3,4,5,6	6	6	

Table 5c: Partitioning the reach ability matrix into different levels (Iteration-3)

Factors	Reach ability set	Antecedent Set	Intersection Set	Level
V2	**2**	**2,3,6**	**2**	**III**
V3	2,3,4,5	3,6	3	
V4	**4**	**3,4,6**	**4**	**III**
V5	**5**	**3,5,6**	**5**	**III**
V6	2,3,4,5,6	6	6	

Table 5d: Partitioning the reach ability matrix into different levels (Iteration-4)

Factors	Reach ability set	Antecedent Set	Intersection Set	Level
V3	**3**	**3,6**	**3**	**IV**
V6	**3,6**	**6**	**6**	

Table 5e: Partitioning the reach ability matrix into different levels (Iteration-5)

Factors	Reach ability set	Antecedent Set	Intersection Set	Level
V6	**6**	**6**	**6**	**V**

Table 5f: Partitioning the reach ability matrix into different levels (Iteration 1-5)

Iteration	Factors	Reach ability set	Antecedent Set	Intersection Set	Level
1	V7	7	1,2,3,4,5,6,7	7	I
2	V1	1	1,2,3,4,5,6	1	II
3	V2	2	2,3,6	2	III
4	V4	4	3,4,6	4	III
4	V5	5	3,5,6	5	III
5	V3	3	3,6	3	IV
5	V6	6	6	6	V

Table 5g: List of variables and their levels in TISM

S. No.	Variable Code	Variables	Level in the TISM
1	V1	Strategic flexibility	II
2	V2	Financial flexibility	III
3	V3	Organizational flexibility	IV
4	V4	Manufacturing flexibility	III
5	V5	Marketing flexibility	III
6	V6	Information Systems flexibility	V
7	V7	Competitiveness	I

Table 4: Reach ability Matrix for Enterprise Flexibility and Competitiveness

	V1	V2	V3	V4	V5	V6	V7
V1	1	0	0	0	0	0	1
V2	1	1	0	0	0	0	1
V3	1	1	1	1	1	0	1
V4	1	0	0	1	0	0	1
V5	1	0	0	0	1	0	1
V6	1	1	1	1	1	1	1
V7	0	0	0	0	0	0	1

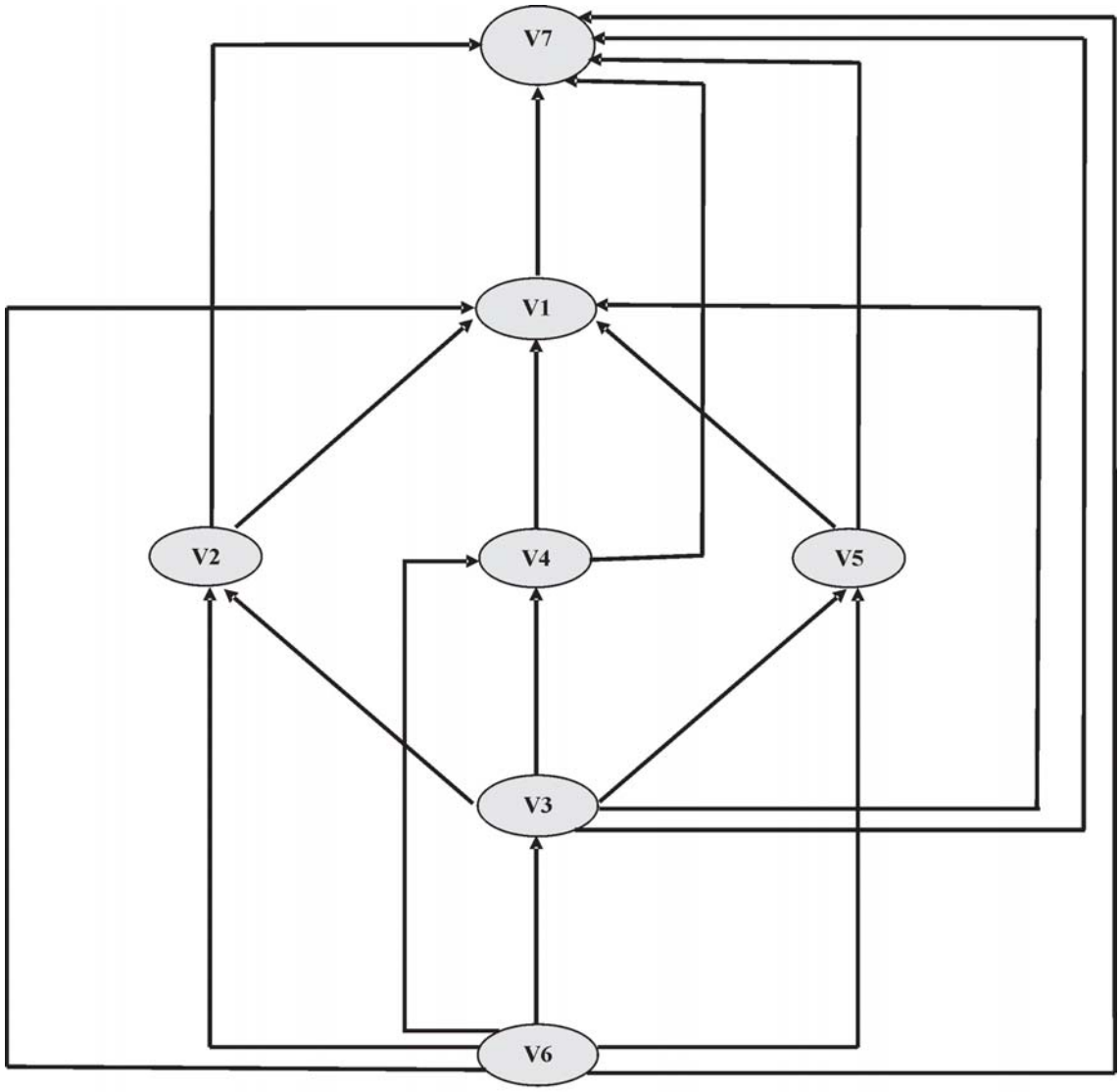


Figure 3: Diagraph

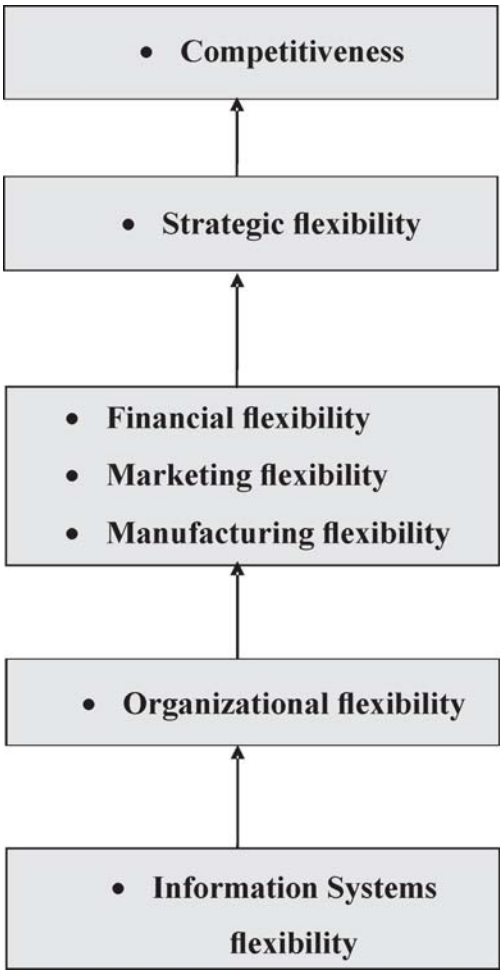


Figure 4: Interpretive Structural Model (ISM) for Enterprise Flexibility and Competitiveness

Exhibit-3a: Direct Interaction Matrix (Binary Matrix)

	V1	V2	V3	V4	V5	V6	V7
V1	-	0	0	0	0	0	1
V2	1	-	0	0	0	0	1
V3	1	1	-	1	1	0	1
V4	1	0	0	-	0	0	1
V5	1	0	0	0	-	0	1
V6	1	1	1	1	1	-	1
V7	0	0	0	0	0	0	-

Exhibit-3b: Direct Interaction Matrix (Interpretive Matrix)

	V1	V2	V3	V4	V5	V6	V7
V1	-	-	-	-	-	-	*Greater flexibility on strategic front enhances competitiveness significantly*
V2	*Being flexible in investment related matters can enhance the options on strategic front for a pharma firm*	-	-	-	-	-	*Greater flexibility on financial front enhances competitiveness significantly*
V3	*Flexible organizations can respond to evolving competitive dynamics*	*Generating greater value*	-	*Flexible in shifting/changing business model, product class etc*	*Helps to adapt their marketing efforts in line with market requirements*	-	*Flexible organizations can respond to evolving competitive dynamics in the market*
V4	*Flexible manufacturing systems and processes can definitely enhance a firm's flexibility on the strategic front in offering different solutions*	-	-	-	-	-	*Delivering differentiated products*
V5	*Flexible marketing campaigns helps in making flexible strategic choices*	-	-	-	-	-	*Flexible marketing campaigns differentiate a firm from competition and offer superior products and services*
V6	Flexible information systems respond quickly to the changing business environment	Flexible information systems can end up generating greater value	*Helps in adopting newer technologies*	*IT systems have a far reaching impact*	*Digital marketing emerges as a differentiating factor*	-	*Flexible information systems helps in responding to market needs promptly and effectively and thereby enhances competitiveness*
V7	-	-	-	-	-	-	-

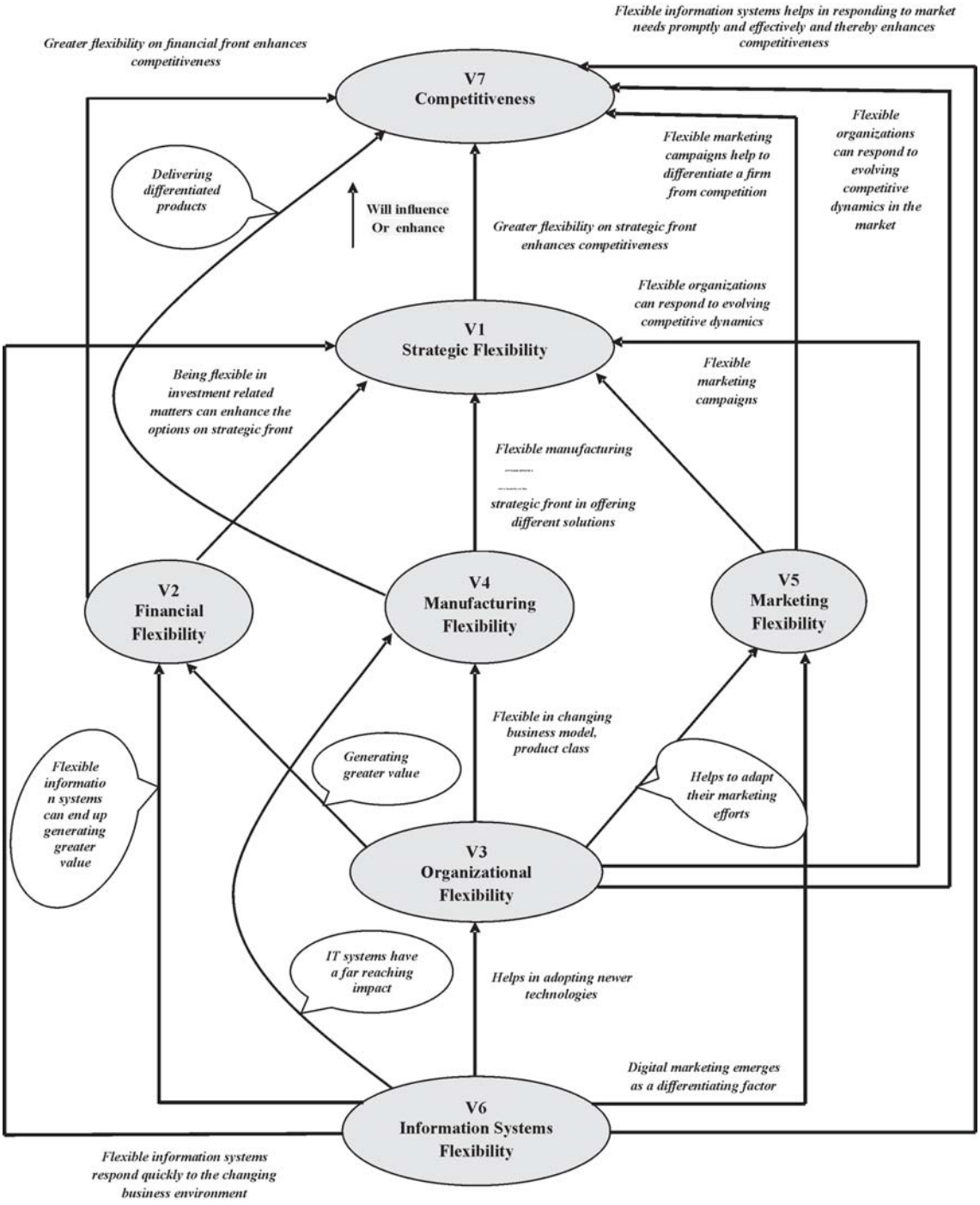


Figure 5: Total Interpretive Structural Model (TISM) for Enterprise Flexibility and Competitiveness

3.4.1 Interpreting the TISM

The contextual relationship among the various types of Enterprise flexibility and Competitiveness along with the interpretive logic was captured by conducting initial discussions with the experts, based on which the TISM model is developed. All the seven variables could be distinctly partitioned into five layers with 'competitiveness' emerging as the dependent variables and placed at the top of the model. The 'competitiveness' has direct links with almost all the other variables in the model, and hence is the key outcome variable of the study. The hierarchical structure of the model highlights the driver and dependence relationships. The variables at the top of the model have higher dependence and those at the bottom have high driving ability.

The structure of the model clearly emphasizes the criticality of 'Information systems flexibility' as the basic driving force affecting the other factors. The micro variable of 'Enterprise Flexibility' i.e. 'Information systems flexibility' is a key factor that will influence a firm competitiveness. In order to be more competitive, firms need to have flexible information systems that can respond to market needs promptly and effectively. Further, it has direct link with organizational, financial, manufacturing, marketing and strategic flexibility and thereby enhancing the competitiveness of pharmaceutical firms.

Similarly, 'organizational flexibility' is a critical factor that has direct link with financial, manufacturing, marketing and strategic flexibility and thereby enhancing competitiveness of pharmaceutical firms as only flexible organizations can respond to evolving competitive dynamics in the market and will definitely influence its ability to adopt newer technologies and enhances organization's ability to be more agile in today's virtual world. Other micro variables of Enterprise flexibility are 'financial, manufacturing and marketing flexibility', which also has a direct link with strategic flexibility and thereby enhancing competitiveness as being flexible in investment related matters can enhance the options on strategic front for a pharma firm. Further, flexible manufacturing systems can help delivering differentiated products to the marketing teams and help to differentiate a firm from competition.

The micro variable, 'strategic flexibility' is a key factor that will enhance the competitiveness of a pharmaceutical firm as greater flexibility on strategic front enhances competitiveness significantly. Flexible strategic choices will help the pharmaceutical firm in becoming more agile in responding to evolving market needs. Strategic decisions will also influence the pharmaceutical firm's flexibility in adopting newer technologies.

3.5 Implications for Researchers and Practitioners

The identification and modeling of various types of enterprise flexibility and competitiveness (in the pharmaceutical domain), as undertaken in this paper, may well serve as key inputs not just for the researchers, but also for the practitioners. The logic captured from the experts explaining the relationship amongst the variables is summarised in the interpretive matrix (as represented in Exhibit 3b-Annexures), is a valuable knowledge base which can be used by the practitioners for better understanding of the domain.

Researchers, in general, too can use the TISM technique to model key constructs for better clarity in their research area. Further, pharmaceutical researchers can also validate the relationships highlighted in the model by undertaking empirical survey and case studies.

The understanding of the interplay of these factors of enterprise flexibility and competitiveness is expected to provide direction in policymaking and strategizing for the implementation of flexibility and competitiveness projects.

4. CONCLUSIONS

In this fast changing interconnected world, it is very critical for enterprises to be flexible enough to grow and remain competitive. Past researches highlight the importance of flexibility to enhance the competitiveness of the organization. The greatest challenge for managers in today's fast changing environment is to strategize to incorporate flexibility that a firm needs in competitive environment. Indian pharmaceutical sector has witnessed rapid growth and transformation, especially, after the Patent Act of 1970. It is imperative to emphasize the role of various types of flexibility in enhancing the competitiveness, given the level of dynamism and change in the pharmaceutical industry.

This paper investigates the relationship among the various types of enterprise flexibility and competitiveness for the pharmaceutical firms in India with the help of a qualitative technique (Total Interpretive Structural Modeling). This technique is used to model the enterprise flexibility and competitiveness factors affecting Indian pharmaceutical sector, for greater understanding of the interplay of these factors.

The key takeaway of the model is that to achieve higher level of competitiveness, firms/ practitioners in the pharmaceutical domain will have to pay greater attention and focus to various aspects of enterprise flexibility, especially strategic and financial flexibility.

Flexibility being a less researched domain, any study linking flexibility with competitiveness is expected to a valuable contribution. Structuring/modeling different types of enterprise flexibility along with competitiveness can be used as a precursor for strategy formulation and implementation. While the resultant model in the pharmaceutical context provides insights for practitioners, the methodology of the modeling technique is expected to be of value to researchers.

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B2B E-Commerce Adoption Framework in Agriculture: Evidences from the Case Study Ofnam

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Abstract

E-commerce is well known global success phenomenon and it is also gaining popularity in Indian Agriculture sector in the form of B2B e-commerce. The initiatives come as a savior to the highly fragmented and inefficient supply chain of the Indian agriculture sector. The B2B E-commerce provides more sale options to farmers, increase direct access to markets, reduce intermediation costs and promote common procedures, scientific storage and quality grading within a better supply chain. The National Agriculture Market (NAM) platform is a major initiative of the Indian government in this sector. To realize the benefits of B2B E-commerce, the high adoption is a pre-requisite. The Author has highlighted the adoption framework for the B2B e-commerce in Indian Agriculture sector. The explicit factors/variables and the implicit constructs (Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Behavioural Intention, Trust, and Cost) of the adoption framework relevant to the Indian agriculture sector are specified via empirical study. The positive relationship between the variable factors to the adoption and intention to adopt is highlighted using univariate statistical analysis of data gathered via the opinion survey. The survey of NAM users provides us with their opinion of influence, relationships, and suggestion for improvement in adoption. The Author expects framework shall help us understand the online behavior of adopters and help bring more and more participants to such useful platform leading to liquidity and eventual success of B2B e-commerce effort in the agriculture sector.

Keywords: Adoption Framework, Agriculture, B2B E-commerce, B2B E-commerce Adoption, National Agriculture Market, NAM, India.

Introduction

The agriculture sector is economically and socially vital to India. It contributes 19% of the GDP, feeds a billion people and employs 66% of the workforce. The GDP of agriculture & allied sectors in India was recorded at USD244.74 billion in FY16 and it is the primary source of livelihood for about 58 percent of India's population (IBEF, 2017). According to the latest India census data, the country has more than 270 million persons employed in the agriculture sector - about 50% of its workforce.

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As a B2B commerce, agricultural commodities are sold through oral auctions for hundreds of years (Banerji and Meenakshi, 2004). In an effort to improve efficiency, oral auctions are now being shifted to a B2B E-commerce format (a major success phenomenon globally) in India.

The purpose of this initiative is to disseminate farming knowledge, provide timely price information, eliminate intermediaries, and transform the agricultural supply chains that support the livelihood of billions of people around the world (Banker et al., 2013).

On one hand, the B2B e-commerce marketplaces are more transparent and competitive than physical markets, conditions that should attract more consumers and thus increase demand for produce in India (Verma & Chaudhuri, 2008). But on the other hand, it has also increased the bargaining power of farmers via opening access to a wider range of buyers. Consequently, farmers obtain a better price when they sell the produce on the digital platform rather than at the farm-field through the few regional agents (Banker et al., 2011).

The B2B e-commerce, is a relatively new activity for the agricultural industry in India. It is affecting organizational strategy, processes, customer relationship, information technology, and business culture of this sector. In addition, it is also changing the marketing, distribution and the economics.

While reason and the benefits are evident, B2B e-commerce adoption in the Indian agriculture sector still faces technology and collaboration barriers. Now, there is an urgent need to understand the adoption of B2B e-commerce in the Indian agriculture sector so that meaningful and actionable recommendations can be drawn from government, participants, business owners and policymakers. In this research, the adoption is described as a business engagement in an online exchange relationship with producers/sellers on the internet.

The Researcher has taken note of a study suggesting, that an idea (e.g. B2B e-commerce in Agriculture) may be novel and has the features of solving the issue at hand, but testing it in a given geography and value chain for the adoption can save a lot of financial and other resources (Ganguly et al., 2017).

Thus, the Researcher believes that the better understanding of determining factors of adoption highlighted via adoption framework shall help companies and policymakers, make suitable strategy and improve management. Doing it early in the life-cycle shall result in success and requisite benefits reaching participants. In addition, it helps the service providers take actions/decisions necessary for increased liquidity (use, volume) required for the very survival of agriculture sector B2B e-marketplace e.g. NAM.

The National Agriculture Market (NAM) is a pan-India digital trading platform started by the Ministry of Agriculture & Farmers' Welfare, Government of India. The NAM Portal is the largest such service in India and provides a single window for all state-regulated Agricultural Produce Marketing Committee (APMC) market-related information and e-commerce services. As of February 2017, 850 thousand participants (including 88 thousandtraders, 44 thousand commission agents) have registered on this e-marketplace portal. So far, 3113 thousand tonnes of agriculture produce worth INR 61300 million has been transacted on this e-marketplace platform (MAFW, 2017).

The Researcher uses the NAM to highlight the determinant factors involved in the adoption of B2B e-commerce in Indian Agriculture sector and use the NAM participant's survey data (analysis) to validate the adoption framework.

Objective of the Research

The primary purpose of this research study is to highlight the adoption framework for the B2B e-commerce in Indian Agriculture sector.

The factors relevant to the Indian agriculture sector are specified via empirical study. The determinant factors are validated using survey data analysis from the case study of Indian Government sponsored B2B Agriculture e-commerce platform "National Agriculture Market" (NAM).

Significance

The B2B e-commerce, in agricultural commodities, is a relatively new activity in India (Verma and Chaudhuri, 2008). Due to lack of data, there is insignificant research on the agriculture B2B e-commerce in India. The Researcher has analyzed the relatively new phenomenon in India.

The proposed adoption framework shall fill the gap for a theoretical framework required for B2B Agriculture e-commerce adoption. The Researcher takes the challenge to understand one of the important phenomena with respect to Agriculture marketing. In addition, it is among very few case studies of the Indian government-sponsored National Agriculture Market (NAM). The findings may help improve the adoption of NAM and diffuse its intended benefits. These benefits include farmers get more options for selling produce, farmers get competitive returns/price, traders get access to the larger national market for secondary trading and companies/buyers/exporters get reduced intermediation cost via direct participation in the local trade.

The agribusiness e-commerce also has much in common with other industry e-commerce e.g. use of the same information technologies, traders pursue their individual interests, and, there is an inverse relationship between supply and demand curves (Clasen and Mueller, 2006). Thus the Researcher believes that the findings of this research shall be also of interest for other industries.

Research Methodology

To figure out research design and research value, the author performed the systematic literature review (Afzal et al., 2009) of approximately sixty research journal articles and conference papers. The guidelines are as per explained in two leading articles on the topic (Biolchini 2005; Kitchenham, 2007). Out of this, the possible factors affecting B2B e-commerce adoption and theoretical framework are identified.

The validation of determinant factors in the framework is done via the survey of NAM participants using a Likert scale based questionnaire response. The multiple questions cover respondent opinions on the factors identified during our secondary research. The Likert scale has options of 1 to 5, where 1 means "Negligible" and 5 means "To an extreme extent" on B2B e-commerce adoption.

The trial questionnaire is pre-tested on 5 respondents (include 1 researcher, 1 professor, 1 industry professionals, 2 users) for suitability, language or editorial correction. In the APMC market of Meerut district (UP State, India), the simple random sampling without replacement (SRSWOR) is used to select the survey response participants. The sampling unit is an actual participant (farmer, trader, buyer, agents) trading on NAM or APMC regulated agriculture market of Meerut. As of now, there are 6000 farmers and 735 traders listed on the NAM system in Meerut APMC. Out of this list, 50 participants were at random picked from this list and approached for questionnaire (in the Hindi language) response. Being an actual participant in a market, respondent is expected to have an opinion.

The Data is collected in the month of November 2017 for a period of 4 days. The survey questionnaire results are entered in SPSS version 20 for descriptive statistics. The univariate analysis is used to get better insights into the conceptualized research variables.

Literature Review

B2B E-commerce and Indian Agriculture Sector

The agriculture supply chain in India is highly fragmented and inefficient. A study of fruit & vegetable supply chain in four metros (Delhi, Mumbai, Bangalore, and Kolkata) revealed that, on an average, there are 5 to 6 intermediaries in the supply chain (Global Agri System Consulting, 2010). Due to the high number of intermediaries, the total markup in the chain is approximately 60-75%, thus the primary producers receive only 20-25% of the end consumer price. The involvement of multiple intermediaries also resulted in huge wastage of 15-25% of the value (Patnaik, 2011; Kaur, 2014).

On top of this, the information inefficiency is high, which relates to product availability at source/market and demand patterns. The most popular reason given is that, the agriculture trade markets in India are dispersed across the country with little coordination, full of trader cartels and works in offline nature.

Given the above scenario, the B2B e-commerce marketplace is seen as the savior. These B2B e-commerce marketplaces (e.g. NAM) comes with relatively low-cost digital-trading and enhance transaction cost efficiency. The improvement is seen in the performance of purchasing rights which are at the right price, delivered at the right time, of the right quality and the right quantity from the right source (Smart and Harrison, 2003; Shirzad and Bell, 2013).

The Indian government's national policy on ICT in agricultural extension also supports a market-oriented policy framework to promote commercialization and diversification using ICT. But, it has to gel with the practical realities on the ground, e.g. complex interactions between the players, the role of tacit knowledge, the high impact of social actors, bad power and internet conditions (in rural India) and low IT literacy level in the agriculture sector (Kaur, 2014).

The earlier studies, focused mainly on defining the concept of electronic marketing and to describe potential applications to agriculture markets, including a gain in pricing efficiency (Henderson, 1984). A study of MarketMaker (a USA government-sponsored electronic trade platform for agriculture) estimated that participants had received an average of 2.6 new marketing contacts and gained an average of 1.5 new customers. In addition, registered farmers increased their annual sales by an average of $121 (Zapata et al.., 2011).

One key insight from the case study of MarketMaker, relevant from India's point of view, is that the e-trading leaders should encourage other participants to become more active to achieve the desired benefits. The reason is that the benefits associated with e-trading marketplace tend to become higher as users become more familiar with the functioning of the website (Zapata et al., 2013). Off-course, for success liquidity is a pre-requisite necessitating the increasing number of farmers registering and using the e-marketplace website. Given this, the peer persuasion and media advertisement are desirable features of e-marketplace.

An analysis of e-marketplace, agriculture.com with a number of hits per day as success criterion, revealed that low transaction costs, national and local language content, number of product categories, trading in agricultural machinery, and age of the e-marketplace are all positively significantly correlated with success (Clasen and Mueller, 2006).

The Indian literature, quotes the main reason for the success of the agriculture B2B e-commerce marketplace have been the involvement of local farmers and maintenance of the rural IT network by the corporate entity (Chahal, 2012). In addition, the participants are willing to pay more for a higher level of trust provided by a neutral, third-party host provider (Vassalos, 2014). Given this, roping in a third party for implementation, support and technical operations by NAM, is a right step.

In the Indian context, a successful e-platform in India shall provide instructions to farmers about how to get the best possible benefits out of B2B e-commerce. Such B2B e-commerce platform, along with e-trading shall also provide information related to marketing, best practices, weather forecast and rural development programme (Waghmare and Rahane, 2011).

Along with success factors come the barriers to success. The three significant barriers are: Change in Industry structure, product complexity and high touch nature of transactions in agriculture (Leroux et. al., 2001). The adoption barriers can lower by a combination of strategies based on; structure of the industry (3rd party marketplaces, strategic alliances, niche players, virtual supply channels), market and product expertise (market knowledge, product expertise, risk profile) and organizational development (learning and training, human touch and knowledge acquisition) (Leroux et al., 2001).

B2B E-commerce Success Stories in India

Initially, on agricultural related websites in India, e-commerce implementation was scarce. This led to early findings that the Indian agriculture has not fully used the potential of ICT and it is restricted only to information side and not to the agricultural product side (Dsouza, 2014).

The earlier success stories are found in the private sector for corporate use, e.g. ITC e-choupal deployed IT technology to make use of the physical transmission capabilities of current intermediaries (aggregation, logistics, counter-party risk and bridge financing) while disintermediating them from the chain of information flow and market signals (ITC, 2017). It is operational in 35000 villages of 10 states using 6100 kiosks and involves 4 million farmers growing 6 crops. The e-Choupal system benefits include a higher profit margin on farmer's crops and access to information that improves the productivity (Verma and Chaudhuri, 2008).

Another noteworthy mention is that of eKutir Global, an online and mobile-based platform to connect small farmers with other value chain stakeholders such as soil-testing labs, suppliers of seeds and fertilizers, banks, exporters, food-processing units, and branded retailers. Most of these and other initiatives, are concentrated in a small area of the country and probably lose steam over time.

Major initiative that overcomes all barriers are commodity exchanges, e.g. National Commodity & Derivatives Exchange Ltd (NCDEX) or National Multi Commodity exchange (NMCE). The commodity exchange deals in up-stream secondary trading where only the trader deals in commodities derivatives (Datta & Sarkar, 2015) with no involvement of farmers.

The limited success of e-commerce has heralded a new era in the Indian agro-sector. Now this work needs to be carried forward and replicated in the other untapped sub-areas (Chahal et al., 2012). Though smaller and narrow focus initiatives (Akashganga, Drishtee, TKK etc.) in the agriculture sector are in existence for decades in India, the pan India-comprehensive-large sized B2B E-commerce platform was the need of the hour. This need for a B2B e-marketplace at the downstream of agriculture supply chain is met by the NAM. The NAM has become the de-facto alternate on-line digital trading platform for agricultural commodities in India.

National Agriculture Market (NAM)

The fragmentation of markets, multiple handling of agro-produce, multiple market charges all end up escalating the prices for the consumers without commensurate benefit to the farmer. To address these challenges and to meet the need of the hour (as mentioned in earlier sections), the Government of India approved a scheme for deployment of a unified B2B e-commerce platform "National Agriculture Market" (NAM, Figure 1). It is being implemented in 585 large and regulated wholesale agriculture markets (at state and national level) by March 2018 out of 2,477 APMC market-yards 4,843 APMC-regulated sub-market yards.

NAM is the flagship scheme of utmost importance since more than 50% of India's population is employed in the Agriculture sector. The scheme is operationalized by Small Farmers' Agribusiness Consortium (SFAC), with a budget allocation of INR 2000 million; out of which a maximum of INR 7.5 million is earmarked for each of the markets.

NAM is a "virtual" B2B marketplace with a physical market (aka "Mandi") at the back end. The transaction process activities (e.g. registration of farmers/ traders/buyers/agents, lot details at the entry, weighment, quality check, auctions/trade transactions, payments) are online in digital form, while actual material logistics is via the physical market. In any market, the select agricultural commodities are traded completely online on e-NAM.

NAM is implemented based on the success of the Unified Market Platform (UMP) in Karnataka, where farmers saw an average realization increase of 38 percent in 2015-16 over 2013-14 (NITI Aayog, 2017). A study covering impact assessment of e-tendering of agricultural commodities in Karnataka conducted by the National Institute of Agricultural Marketing, Government of India, reveals that about 83% of stakeholders felt that the operations have become more transparent and time-efficient. So Far, NAM progress is slow but it will fill the infrastructure gaps that arose over six decades but would need the education of farmers and training (Subramanian, 2017).

As per Press Information Bureau, so far, 417 markets from 13 states have been integrated with e-National Agriculture Market (Government of India, 07-April-2017). To facilitate quality grading of agricultural commodities for e-trading, common tradable parameters have been developed for 25 commodities incl. wheat, maize, pulses, oilseeds, potatoes, onions, and spices, etc. (DACFW, 2016). Globally, several commodities have converged to a single internet trading platform (Wheatley and Buhr, 2005) and NAM formation is the similar example.

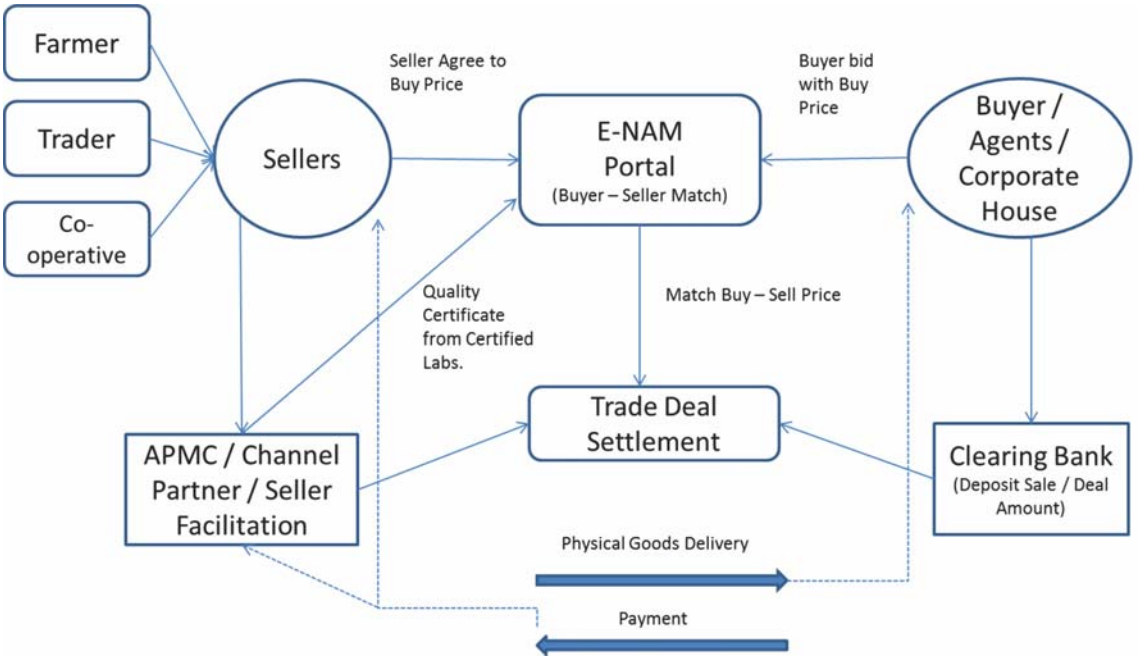


Figure 1: e-NAM Outline (Government of India, 2017)

The NAM initiative is aimed to take India's agricultural marketing system to a higher level. This initiative will prove to be a game changer for India's farmers and agriculture sector if it is implemented in true spirit (Chand, 2016). As of now, NAM is pushed by the government as a mandatory activity.

Indian farmers and other farmers have leveraged technology to achieve higher and sustainable agricultural growth and hopefully, they will make use of NAM initiative. For all this, the high adoption of NAM is a pre-requisite.

Adoption Framework Selection

To get the better understanding of adoption, the Author reviewed the empirical research on e-commerce/technology adoption theories and frameworks. In a search of online research database "PRO-QUEST" on April 25, 2017, prominently among the search results is the Unified Theory of Acceptance and Use of Technology (UTAUT) with 1000 hits. The UTAUT (Venkatesh et al., 2003) integrates the technology acceptance domain into one theory with 'behavioural intention' and 'actual usage behavior' as main dependent variables.

The UTAUT model is already validated in a cross-cultural study to conclude its robustness to be applied across countries (Oshlyansky et al., 2007). Since its inception in 2011, the UTAUT has emerged as a better choice based on the variance explanation analysis undertaken by several researchers. The UTAUT is able to account for 70 % of the variance (adjusted R2) in usage intention (Venkatesh et al., 2003) that is better than other competing models which explained between 17% and 53% of the variance in user intentions to use the IT system, e.g. TAM2 (53%), TRA (36%), TPB (36 – 47%) and IDT (40%).

The UTAUT is also applicable to both individual and organization subjects. UTAUT is mentioned in a number of research; A study of perceptions of 243 individuals in northern Finland toward mobile services and technology (Koivumäki et al., 2008), A study of social influence of workplace referent groups (superiors, colleagues) on intention to adopt technology in 152 German companies (Eckhardt et al., 2009), the adoption of social media by 409 United States non-profit organizations (Curtis et al., 2010). The theory is also used to explain mobile technologies (Park et al. 2007), mobile learning (Wang et al. 2009), mobile shopping services (Yang 2010), mobile banking (Yu, 2012), mobile stock trading (Tai and Ku, 2013) and location-based services (Zhou 2012). The extended UTAUT is also used in several studies, e.g. the physicians' adoption of robotic-assisted surgery (BenMessaoud, Kharrazi, and MacDorman, 2011), mobile learning in Taiwan (Wang, Wu, and Wang, 2009) and m-banking adoption in India (Deb and David, 2014).

B2B E-commerce Adoption Framework

Based on the literature review and the UTAUT adoption theory mentioned above,we selected the criterion that is appropriate for context under consideration that is "B2B E-commerce in Indian Agriculture Sector". The six factors appeared to be significant direct or indirect determinants of B2B e-commerce adoption in Indian Agriculture Sector. These determiningfactors are hereby shown in a proposed Framework (Figure 2), which two additional factors in a modified UTAUT framework.

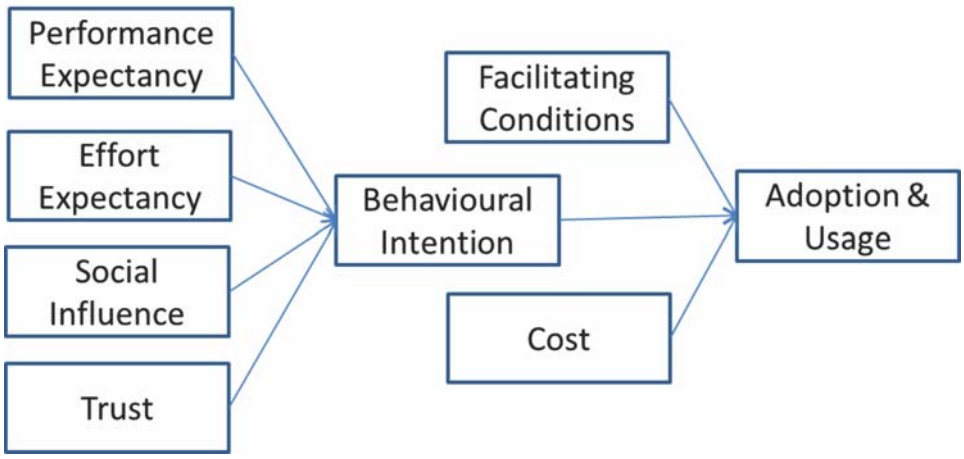


Figure 2: Graphical View of Research Model

The main constructs as per the UTAUT (Venkatesh, 2003) in the framework are:

Performance Expectancy (PE) is defined as the degree to which an individual participant believes that using the B2B e-commerce system will help him or her to attain gains in job performance.

Effort Expectancy (EE) is defined as the degree of ease associated with the use of the B2B e-commerce system.

Social Influence (SI) is defined as the degree to which an Individual participant perceives that how important others believe he or she should use the new B2B e-commerce system.

Facilitating Conditions (FC) is defined as the degree to which an individual participant believes that an organizational and technical infrastructure exists to support the use of the B2B e-commerce system.

Behavioral Intention (BI) is the degree to which an individual has made a conscious plan to perform or not perform a future behavior.

The two new constructs added to the framework are:

Trust embodies the trusted confidence in the trustee's actions. It is also an expectation that the trustee's promise can be relied on and that the trustee will act in the spirit of goodwill. Trust is an important factor in relationships with partial information about counter-party (Hawes et al. 1989), especially in virtual communities (Ridings et al., 2002). The analysis of trust in a virtual community is relevant since it may be the main precursor of consumer participation and a crucial aspect for developing sustainable communities in the long-term (Casalo et al., 2011). The researcher expect that high trust has positive effect on adoption.

Cost (transaction cost) is another major factor. A researcher found that if the government lowers the internet service costs or provides free e-commerce facilities, it can encourage businesses to adopt e-commerce (Solaymani et al., 2012). Another researcher suggests that the higher fees charged to market participants, reduce demand for e-marketplace services, and may reduce utility and chances for success (Clasen and Mueller, 2006). Thus, the researcher expect that high cost has negative effect on adoption.

Analysis

To check, the practical applicability and robustness of the adoption framework an opinion survey is conducted among NAM participants (farmer, trader, official) in the Meerut APMC market.

Out of 50 survey responses, 40 responses were found to be complete and used for data analysis. The internal consistency reliability of each construct is tested via Cronbach's alpha which is 0.65. A score of 0.60 or above is an acceptable value of for empirical research (Hair et al., 2006; George and Mallery, 2011).

The descriptive statistics presented in Table 2 show the values of range, mean, Std. deviation, skewness, and Kurtosis of the constructs. The standard error associated with all the variables being negligible, the observed sample mean values can be interpreted in general. In NAM, the observed mean value of the construct upon relatively more or less significance of that constructs over others. Detailed analysis of observed mean values of framework constructs is described in Table 2.

Table 2: Univariate Statistical Analysis

Construct	Mean	Observed Variables	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
Performance Expectancy	4.16	Useful in Job	40	3	5	4.38	.540	.016	-.970
		Accomplish Task Quickly	40	3	5	4.15	.700	-.215	-.871
		Help get raise / bonus	40	3	5	3.95	.677	.060	-.708
Effort Expectancy	3.28	Interaction with system is clear and understandable	40	2	5	3.43	1.059	.139	-1.160
		System is easy to use	40	2	5	3.30	.939	.325	-.664
		Learning to operate system is	40	2	5	3.13	.853	.012	-1.088
Facilitating Conditions	3.28	I have the necessay knowledge and resources	40	2	5	2.95	.986	.611	-.782
		System has compatibility issues	40	2	5	3.13	.911	.385	-.617
		Help is available when required	40	2	5	3.78	.862	-.547	-.081
Trust	3.62	Information (valid, credible and	40	2	5	4.03	.920	-.676	-.282
		Trust in Seller	40	2	5	3.58	.781	-.432	-.108
		Trust in Buyer	40	2	5	3.25	.670	.202	.176
Cost	3.41	Transaction cost	40	2	5	3.58	.813	-.255	-.291
		Poduce Cost	40	2	5	3.25	.670	.202	.176
Social Influence	4.37	People (Important, Influencer)	40	3	5	4.45	.639	-.737	-.395
		Senior management is helpful	40	3	5	4.23	.480	.608	.106
		Organization support use of	40	3	5	4.43	.636	-.649	-.483

The mean value of "Social Influence" construct (4.37) is relatively high. No wonder, when we asked NAM users and officials at Meerut APMC market, all quoted as the government and senior management pushing the use of NAM as the preliminary reason for adoption in this early stage. Next highest mean value (4.16) is for "Performance Expectancy" construct, given that once a user starts using the digital platform of NAM, they get a quick response and faster process (e.g. electronic payment), which impress them, but also increases their expectations to get personal benefits, which respondent said has not occurred at personal level. Though at the business level, the seller, are realizing better produce prices from traders and buyers, but mean value of "cost" construct (3.41) as well as price realization has a scope of improvement.

The mean value (3.62) of "Trust" construct is also on the relatively high side, given that website Information is accurate and NAM platform is owned by the government and mandatory for

select Agri-commodities. We found that similar observations when the Author spoke to respondents about IFFCO bazaar but when we discussed the other private platform, respondent were either unaware or gave low ratings.

The construct "effort expectancy" and "facilitating conditions" has relatively low mean value (3.28), which was evident by high dependency of user on NAM contract staff, availability of only two labs for sampling and testing, low promotion and training of users (only one promotional event per month at the APMC market level) and high user dependency on authorized market facilitators. The traders are successfully using the NAM mobile applications which need to be highly promoted at farmer level.

Conclusion

Based on the modified UTAUT, this study proposes a comprehensive adoption framework for the B2B e-commerce adoption in Indian Agriculture sector. The univariate statistical analysis gives us a better understanding of the relationship between adoption and framework constructs. The survey analysis shows a positive relationship as all the influencing constructs as the mean value between 3.28 and 4.37 on the scale of 1 to 5. For the explicit variable level also, the relationship is positive as the mean value range between 2.9 and 4.45.

As per the results of an opinion survey conducted in the Meerut APMC market, the NAM project is characterized by high observed values of adoption, intent to adopt and influencing variables. This finding highlighted the need to manage the influencing factors/variables so as to improve both the intent and the actual adoption of NAM.

Looking for specific recommendations of this survey-based research, the quality and amount of information on NAM website and the mobile application shall be improved as the author found some information missing. Also, the main NAM portal response speed was slow given that broadband connectivity is only 1 Mbps and that too is not 100% available. This need to be improved.

In view of significant social influence, the influencers (participants who can affect their peer group) shall be given special attention and promotional offers to be made to early adopters. In our review of Meerut APMC, we found that though there are 6000 farmers and 735 traders registered on the NAM, on average daily only 6 trades are completed (with e-payments) and 30 (without e-payments), thus there is a huge need for awareness promotion, education, and training. The monthly promotional meet (Mela) has to be better advertised and organized fortnightly or monthly at multiple locations.

In addition, looking at resistance to adoption from the trading community, the NAM shall develop partners' expansion plan from the beginning including promotional efforts to improve perceptions of benefits. Also, the technological and financial assistance may be provided to potential participants with low organizational readiness and carefully in-act influence strategies to reduce resistance (Iacovou, 1995).

For trust, the strong authentication shall be used as well as the payment mechanism properly encrypted. Its use in terms of number of e-payment backed transactions percentage need to be improved from the process improvement point of view. Beside rest, the operational and transaction costs on NAM can be further lowered by direct benefit transfer to users as well as direct salary payment to operational staff.

For facilitating conditions, the working hours of quality check labs in NAM mandis may be increased and the government may encourage startups in the vegetable delivery sector to also procure crops from NAM.

Going forward to earn profits, the government shall amend the State Agricultural Produce Marketing Committee Act (APMC) Acts (in tune with the central government model APMC Act 2017) plus ensure physical logistic support to farmers (Yadav & Sharma, 2017) e.g. case study of Meerut APMC shows that as of now logistics is left to traders to handle.

Another, point emanating from literature review is to fasten the interoperability of the central government provided e-trading platform with state e-trading platforms with/without spot-future market integration.

The literature review of the end user grievances, the few other improvements suggested are Geotag existing storage facilities, analyse demand, the supply gap in storage, accredit storage units and establish a dispute resolution mechanism for NAM (none exists as of now), and include timelines to existing implementation progress tab to monitor milestones in Mandi integration (DARPG, 2017).

The officials have to ensure that markets do not get cornered gain by speculators or cartels that drive prices up or down (the author found that role of APMC market "Secretary" and "market inspector" is paramount in this criterion).

Limitations

The research study suggests that it is quite possible that framework variables may be influencing the intent and actual adoption of B2B E-commerce in Indian Agriculture sector. The framework and linkage (between constructs) hypotheses can be tested further based on a detailed study across more APMC markets and a larger survey of more NAM users/participants.

In fact, the Structural Equation Modelling may be used on a larger dataset of responses, to establish the influencing plus direct-indirect relationship in the adoption framework. The framework can be further tested for applicability on different Industries or organizational characteristic perspective. The B2B E-commerce adoption framework fit will be also improved with a larger survey dataset and a better mix of respondents.

The study is cross-sectional since it measured perceptions and intentions at a single point in time. However, perceptions may change over time with experience (Venkatesh & Davis, 2000; O'Neill, 2003), thus a longitudinal study may add some more insights on causality and interrelationships. The effect of mediating context variables (Respondent Type) is not analyzed in the present study, but it is further explored in the future study.

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Strategic Flexibility of Indian Corporates – A Study of Market Response to Cross-border acquisitions

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Abstract

In today's highly volatile and competitive business environment, organizations are espoused to have strategic flexibility. Viewed from this perspective, cross-border acquisitions have become a critical constituent of expansion strategies for corporates especially in emerging economies. The aim of the paper is to analyze the share price reaction to the announcement of cross-border acquisitions by firms from emerging economies.To meet these objectives, 110 cross-border acquisitions announced by Indian companies during the period of 2012-2015 constitute the sample of the study.It has been observed that shareholders of the acquiring firm experience statistically significant and positive average abnormal return (AAR) of 0.49% on the day of announcement. Also, cumulative average abnormal returns (CAAR) examined over multiple event windows also point to significant value creation for Indian bidders. Moreover, the gains are more pronounced when the acquired firm is based in developed markets.This research work endeavors to widen the existing understanding on cross-border acquisitions by examining the short-run performance of CBAs by enterprises from emerging markets(like India).

Keywords: Cross-border acquisitions, India, Share price performance, Event study, Emerging markets, Developed markets

Introduction

The liberalization and globalization of financial markets, fierce competition and technological developments have made business organizations vulnerable to volatile, uncertain, chaotic and ambiguous (VUCA) environment (Sushil, 2017). To manage these threats effectively, firms perforce are compelled to be flexible and competent with respect to their strategic processes (Hina et al., 2016).Firms have to move away from the clutches of rigidity and create flexible organizations.

As a concept, flexibility may be defined in terms of access to various options, change mechanisms in various processes/strategies and freedom of choice (Sushil, 2017a; 2017b).In today's turbulent and unpredictable environment, maintaining competitive advantage with only one option evidently has become an arduous task for business firms. Thus, organizations from emerging economies are exploring multiple options by venturing into overseas transactions.

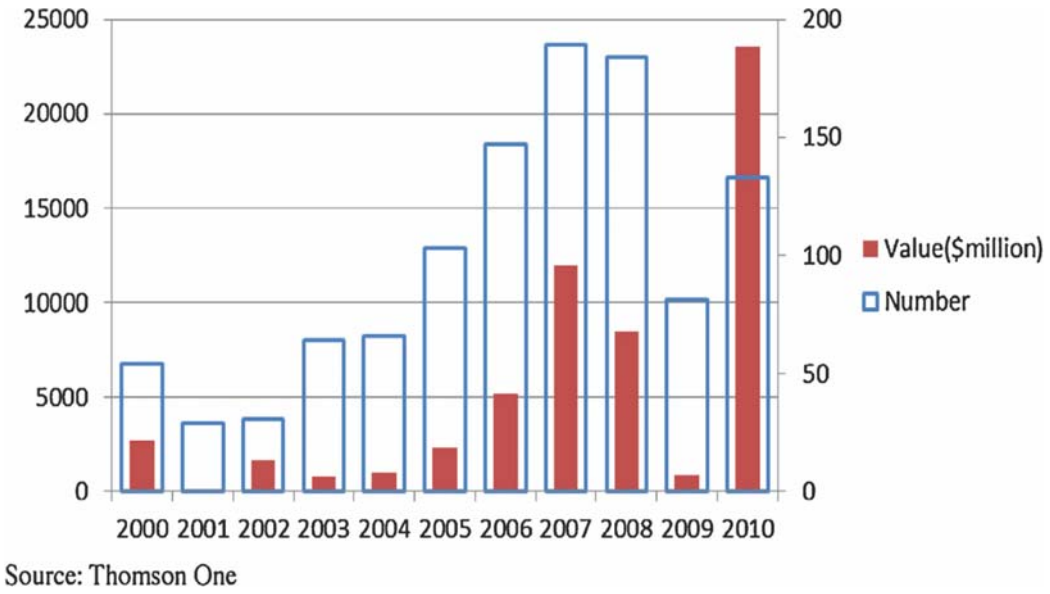
Exhibiting strategic flexibility, MNCs from emerging markets have been rigorously involved in cross-border acquisitions (CBAs) to make their presence felt at the global level. As a result,

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there has been a sharp increase in outward foreign direct investment (FDI) from developing economies. According to the recent UNCTAD World Investment Report, FDI from emerging economies reached a record level of US$454 billion and accounted for 39 per cent of global FDI outflows; it was only 7 percent15 years ago(UNCTAD, 2014). Also, there has been an increase of cross-border acquisitions (CBAs) from emerging markets, surging from US$63 billion to US$109 billion in one year (UNCTAD, 2014).

Apropos to this, overseas acquisition has developed as an inevitable ingredient of the expansionstrategies by Indian firms seeking diversification of operations and quick access to international markets. These strategic decisions improve the geographical and operational flexibility by allowing firms to develop a network of businesses in different parts of the world. Since the 1990s with the liberalization and privatization of Indian economy, Indian companies have been making huge investments in foreign markets to expand their operations across national boundaries.

It is evident from Fig. 1 that the number of cross-border acquisitions completed by Indian firms has shown, by and large, an increasing trend during 2000-2010. The global financial crisis in 2008 caused a sudden plunge in the number of overseas transactions that regained its momentum in 2010.Since 2010, CBAs have shown an upward trend with 40,400 deals amounting to $ 3.5 trillion being transacted in 2014 (Swaminathan et al., 2014).



Source: Thomson One

Figure 1: Completed Cross-border deals by Indian firms 2000-2010

Hitherto, most of the literature in the area of mergers and acquisitions in all disciplines of management has evolved in developed markets. Filling the void, this academic work seeks to widen the existing knowledge on mergers and acquisitions by examining the short-run share price performance of Indian acquiring firms involved in CBAs. India, being one of the fastest and largest emerging economies, has been taken as the representative country. Moreover, to understand the pattern of value creation, a disaggregated analysis has been conducted on the basis of the status of target country (developed/ emerging).

The rest of the paper has been organized as follows: Section 2 reports the existing studies and their findings. Section 3 describes the methodology and the data used in the study followed by section 4 comprising the empirical results and discussion thereof. Lastly, Section 5 contains the concluding observations.

Literature Review

A substantial amount of academic work has been carried out for analyzing the performance of cross-border acquisitions in virtually all domains of management. But most of the studies have evolved in the context of developed economies; the studies in the context of emerging economies provide mixed evidences on the subject. Put differently, whether such strategic decisions successfully increase the market value of bidders or not, remains unanswered. Some of these studies indicate significant and positive returns to the acquirers' shareholders; while others point to wealth diminution. Also, there is disagreement with respect to the measures used to analyze the performance of cross-border acquisitions. Several scholars have examined synergy gains from cross-border acquisitions in terms of abnormal stock market returns(Duppati and Rao,2015; Gubbi et al.,2010; Rani et al.,2014a, 2014b, 2015)in the short-run; while a few researchers focus on long-term performance analysis in terms of financial ratios (Narayan andThenmozhi,2014).Mittal and Jain (2012) have attempted to use an integrated framework (inclusive of both strategic and financial measures of performance) to assess mergers and acquisitions performance.

The focal point of this study is to analyze the magnitude of value creation/destruction in the process of cross-border acquisitions from the point of view of acquiring companies. Gubbi et al.(2010);Rani et al. (2015) have observed positive abnormal returns(AR) with the minimal probability of being insignificant for the Indian acquirers. Further, they noted returns to be relatively higher when target companies happen to be from developed markets.They cited acquisition of strategic and intangible resources including advanced technology, brands, distribution channels etc., to be the drivers of value creation in CBA. Jain et al. (2017); Rani et al. (2014) andDuppati and Rao (2015) have provided empirical evidence of positive stock market reaction post CBA announcement by Indian companies.

In multiple-country context, Bhagat et al.(2011) have observed significant positive abnormal returns(AR) of 1.09% on the day of CBA announcement by the acquirers from emerging markets while, Aybar and Ficici (2009);Narayan and Thenmozhi (2014) have notedconsiderable deterioration in terms of value in the wealth of shareholders of the acquiring companies from emerging nations.

Few studies (Corhay and Rad, 2000;Uddin and Boateng, 2009; Cakici et al.,1996) have examined value implications of overseas acquisitions for the bidding firms from developed capital markets and reported statistically significant negative returns. Aw and Chatterjee (2004); Conn et al.(2005);Kohli and Mann (2012); Rani et al. (2014) have compared the performance of domestic acquisitions with cross-border acquisitions, and reported mixed results.

Despite voluminous studies on mergers and acquisitions, inquisitiveness of various stakeholders viz., researchers, education intelligentsia, policy-makers and senior executives with regard to share market reaction to the announcement of CBAs by emerging economies largely remains an unexplored field.Hence,the present study is a modest attempt to contribute to the extant literature on mergers and acquisitions.

Methodology

Data collection and sample selection

Cross-border acquisitions announced and completed during 2012-15 by the Indian companies listed on CNX Nifty 500constitute the sample of the study. The time period of 2011-12 onwards indicated an increasing trend in terms of number of cross-border acquisitions following global financial crisis of 2008.Hence, the research period has been taken from 2012-15.Further, preliminary data pertaining to the overseas acquisitions by Indian companies have been sourced from Bloomberg database, a financial database having global coverage. For each deal, the database lists the announcement and completion date, name of the acquirer and the target company, the target country and other deal specific information. Further, the announcement dates have also been manually verified from the corporate announcements on Bombay Stock Exchange (BSE) and National Stock Exchange (NSE). The process of sample selection includes the following steps:

Firstly, to satisfy one of the assumptions of the event study methodology, event window around each announcement date has been scrutinized to control for any confounding effect (McWilliams and Siegel, 1997) including announcement of financial results and declaration of dividend. Then, adjusted closing price data on daily basis for acquiring companies as well as CNX Nifty 500 index has been taken from Bloomberg. Stock must have been traded for atleast 180 days before and 10 days after the event to form a valid sample. This process has yielded a final sample of 110 CBAs with an Indian company as the bidder.Based on SIC codes, acquiring firms have been grouped into various industries as shown in Table1. Out of total sample of 110 cross-border acquisitions, 82 transactions involved target firms located in developed markets while 28 deals involved target companies from emerging economies. The target country has been bifurcated into developed or emerging market depending on its current memebership status in the Organization for Economic Co-operation and Development (OECD) (Gubbi et al., 2010). Table 2 shows the geographic distribution of CBAs embarked upon by Indian companies during 2012-2015.

Table 1: Industrial classification of the acquirers

Industry	No. of CBAs
Mining	8
Manufacturing	58
Transportation, Communications, Electric, Gas, and Sanitary Services	6
Wholesale Trade	1
Services	37
Total	110

Source: Compiled by the author

Table 2: Geographic distribution of the sample

Target Country	Status	No. of CBAs executed	Target Country	Status	No. of CBAs executed
Azerbaijan	Emerging	1	Luxembourg	Developed	1
Australia	Developed	3	Malaysia	Emerging	2
Brazil	Emerging	1	Mozambique	Emerging	1
Bahamas	Developed	1	Oman	Emerging	1
Canada	Developed	2	Philippines	Emerging	1
Chile	Developed	1	Mexico	Developed	1
Cameroon	Emerging	1	Netherlands	Developed	1
China	Emerging	1	Sweden	Developed	3
Cyprus	Developed	1	Switzerland	Developed	1
Croatia	Emerging	1	Turkey	Developed	1
Denmark	Developed	1	U.K.	Developed	5
El Salvador	Emerging	1	U.S.	Developed	38
Ethiopia	Emerging	1	Russia	Emerging	2
Finland	Developed	1	Singapore	Emerging	5
France	Developed	4	South Africa	Emerging	5
Germany	Developed	12	U.A.E.	Emerging	1
Italy	Developed	3	Uganda	Emerging	1
Liberia	Emerging	1	Vietnam	Emerging	1
Japan	Developed	2	**Total**		110

Source: Compiled by the author

Methodology

The event study methodology has been applied to measure the valuation impact of CBA announcement on the acquiring firms. Mackinlay (1997) stated in his work that the impact of any unexpected corporate event on the valuation of the firm can be quantified by observing changes in its equity price over a relatively short period of time. CBA announcement is the event of interest in this case.

The day respective stock exchange is formally apprised of the board of directors' approval of the acquisition transaction has been taken as the announcement date.The expected/normal returns have been computed using the estimation period of 150 (-180,-31) daysprior to the acquisition event. Abnormal returns are observed over multiple event windows (-1,+1),(-3,+3),(-5,+5) to nullify the element of inefficiency in emerging countries like India; this enables to have more robust results by controlling for leakages, if any.

Stock prices respond to various factors at firm,industry and macro level. Event study is concerned with how much movement in stock price is brought by the event under study.As such, all event windows have been manually cleaned for any confounding events or contamination of information

from various sources including company website,archives of corporate announcements of the Bombay stock exchange (BSE), newspapers,corporate magazines and news portals.The abnormal return on any security 'i' at point 't'(AR_{it}) is obtained by deducting the normal return $E(R_{it})$ from the actual return(R_{it}), earned during the event window

$$AR_{it} = R_{it} - E(R_{it}) \quad (1)$$

Expected/normal returns for sample Indian firms engaged in CBA have been computed using standard market model as suugested by Fama (1976) and employed by Brown and Warner(1980;1985); Kothari and Warner (2004); Kashiramka and Rao (2014) and Jain et al. (2017). The market model describes the relationship between security's return and the return of market index in the following manner:

$$R_{it}=\alpha_i + \beta_i R_{mt} + \varepsilon_{it}, \text{ where } \quad t = -180\ldots. -31 \quad (2)$$

In the above equation, α_i & β_i are the parameters indicating the constant term and market beta of the 'ith' stock respectively. R_{mt} is the return on market index where the securities are listed (Nifty 500). $\varepsilon_{it}$is an error term.

The parameters are estimated by regressing security return on the market return using time-series data from the estimation period that excludes and preceeds the event window.The estimated parameters are then used in the calculation of abnormal returns during the event window.The daily excess return of firm i for the day t (AR_{it}) is estimated from actual returns during the event period and the estimated coefficients from the estimation period:

$$AR_{it} = R_{it} - (\hat{\alpha} + \hat{\beta} R_{mt}), \quad \text{where } t = -5\ldots.+5 \quad (3)$$

The average abnormal return (AAR_t) for each day in the event window is calculated as per equation 4:

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{it} \text{ where N is the number of acquisition events} \quad (4)$$

The cumulative abnormal returns (CARs) are daily abnormal returns cumulated over part of the event period. Over an interval of two or more trading days beginning with day T_1 and ending with day T_2, the cumulative average abnormal return (CAAR) is:

$$CAAR_{t1,t2} = \sum_{t1}^{t2} AAR_t \quad (5)$$

This paper tests the following two null hypotheses:

H_{01}: The average abnormal return (AAR) on the CBAs announcement is zero.

H_{02}: The cumulative average abnormal return (CAAR) on the CBAs announcement is zero.

Statistical significance of abnormal returns can be assessed using both parametric and non-parametric tests. To ensure that findings are not induced by outliers, the present work uses a combination of one parametric cross-sectional t-test and one non-parametric generalized sign test.

Results and Discussion

Tables 3 and 4 illustrate the abnormal returns for the shareholders of the Indian companies bidding for overseas organizations. Table 3 reports the average abnormal returns (AAR) on the announcement day in addition to the ratio of positive and negative average abnormal return; while cumulative average abnormal returns (CAAR) along with the number of positive and negative

cumulative abnormal returns have been summarized in Table 4. Moreover, the results of parametric and non-parametric tests performed to ensure the robustness of returns have also been presented in Tables 3 and 4.

Table 3: Overallaverage abnormal returns to acquirers over 11 days (-5, +5) event window

Days	AR (%)	t-test	Pos:Neg AR	Generalized Sign Z
-5	0.29	1.4164	51:59	-0.1744
-4	0.13	0.8424	53:57	0.2075
-3	0.04	0.2178	52:58	0.0166
-2	-0.09	-0.5153	45:65	-1.3204
-1	0.13	0.7449	58:52	1.1625
0	0.49	2.0862**	64:46	2.3085**
1	0.34	1.3236	60:50	1.5445
2	-0.17	-0.7937	48:62	-0.7474
3	-0.35	-1.7386	42:68	-1.8934
4	0.40	1.3841	55:55	0.5895
5	0.24	1.26	63:47	2.1175

***, ** and * indicate significance at1%, 5% and 10%

Table 3 enumerates that shareholders earn positive abnormal returns of 0.49% on the day of announcement of cross-border acquisitions; the results come out to be significant at 5%. Nearly 60% of the total deals exert statistically significant and positive effect on the value of the bidding firms. Besides, the acquirer shareholders also experience positive cumulative abnormal returns over different event windows (-1, +1), (-3, +3) and (-5, +5). The returns are significant at 5 % for 3 (-1, +1) days and 11 (-5, +5) days event period. The findings are in concurrence with the results observed by Gubbi et al. (2010); Bhagat et al. (2011) and Rani et al. (2015).

Figures 2 and 3demonstrate the pattern of average abnormal returns and cumulative abnormal returns observed during 11 days (-5, +5) event window. As depicted in the graph, abnormal returns begin to show an increasing trend from two days before to two days after the focal event; yielding highest return on the day of announcement of cross-border acquisition.

Table 4: Cumulative average abnormal returns for acquiring firms over different event windows

Event Window	CAAR (%)	t-test	Pos:Neg CAR	Generalized Sign Z
(-1, 1)	0.97	2.4452**	66:44	2.6905**
(-3, 3)	0.39	0.7305	52:58	0.0166
(-5, 5)	1.46	2.0144**	63:47	2.1175**

***, ** and * indicate significance at1%, 5% and 10%

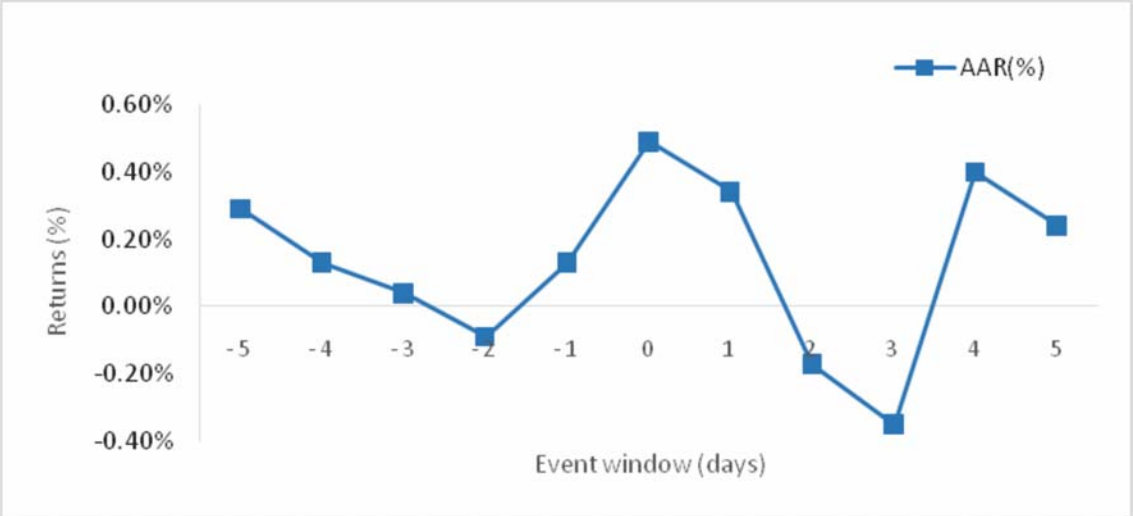


Figure 2: AAR of cross-border acquisitions over 11(-5, +5) days event window

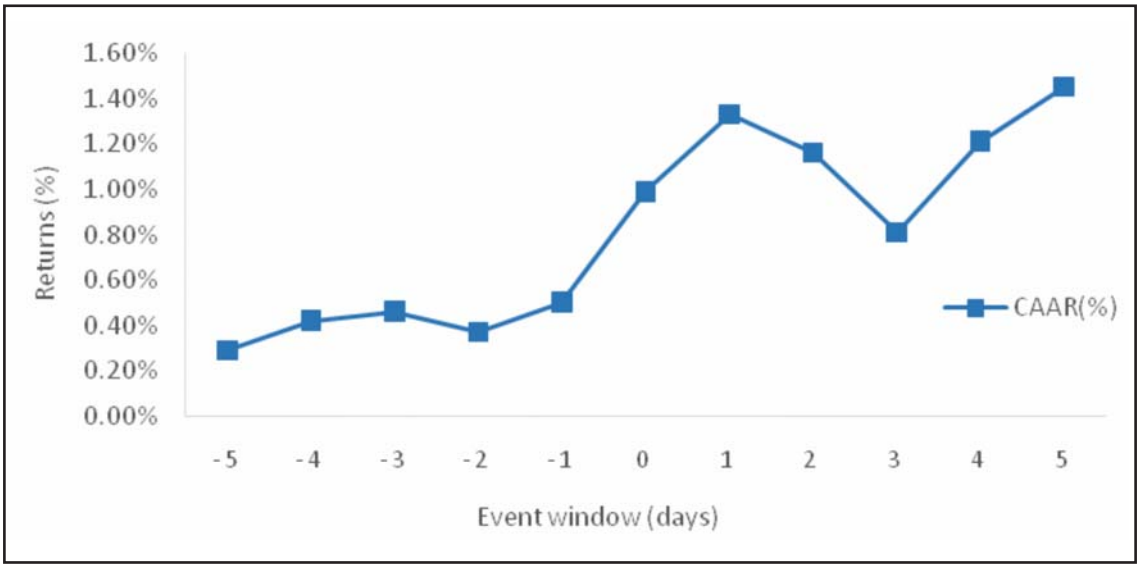


Figure 3: CAAR of cross-border acquisitions over 11(-5, +5) days event window

The impact of the development status (developed/emerging) of the acquired firm's country on the value of the acquiring firm has been compared in Table 5. Empirical findings indicate that bidding for a target firm located in developed markets vis-à-vis emerging economies yields higher and statistically significant returns of 1.29% and 1.63% over 3 days (-1, +1) and 5 days (-5, +5) event window. Equally revealing to note is that acquisition of a target firm based in emerging economies also provides positive albeit not statistically significant returns to the bidders during distinct event windows. These findings are similar to the results reported by Rani et al. (2015).

Table 5: Impact of the status of target firm on CAAR for acquirers over multiple event windows

Event Window	CAR (%)		t-test		pos: neg		Generalized Sign Z	
	Developed	Emerging	Developed	Emerging	Developed	Emerging	Developed	Emerging
(-1, 1)	1.29	0.01	2.6016***	0.0175	51:31	15:13	2.8276***	0.4965
(-3, 3)	0.47	0.17	0.6859	0.2461	38:44	14:14	-0.0502	0.1185
(-5, 5)	1.63	0.95	1.8085*	0.8878	46:36	17:11	1.7208*	1.2526

***, ** and * indicate significance at1%, 5% and 10%

Concluding Observations

The existing volatile and chaotic business environment have pushed firms to be more flexible with respect to their strategic management process. With this in mind, the present study has evaluated the impact of stratgeic transition from organic approach to inorganic mode of expansion across national boundaries. Firms from growing economies have increasingly been using cross-border acquisitions to gain competitive advantage and establish their foothold in the world economy. Moreover, such firms, as against acquirers from developed markets, are motivated by the desire to seek strategic resources rather than exploiting their existing resources and own proprietory knowledge & capabilities.

This academic work measures the market response in terms of share price reaction to the announcement of CBAs by Indian firms. Accordingly, the study attempts to find out whether such acquisitions enhance or destroy the wealth of the bidding firm shahreholders. In addition, it has examined if the status of the target countryhas any significant impact on the returns of the acquirers. In other words, whether acquiring a target firm located in developed market generates more wealth for the acquirers vis-a-vis the target firm based in emerging country.

The short-run share price performance of 110 CBAs announced and completed by Indian companies during 2012-2015 has been assessed. The event study methodology has been employed to evaluate the movement in stock price as a consequence to the announcement of CBAs. The empirical findings suggest that announcement of CBAs has positive wealth effects for the shareholders of the acquiring firms; acquirers experience non-negative and statistically significant abnormal returns on the announcement day as well as significant and positive cumulative returns have been observed over multiple event windows. Furthermore, returns are higher for acquisition of targets in advanced market in comparison to emerging economies.

Cross-border acquisitions are more likely to generate synergy gains resulting from economies of scale and scope. Scale economies improve the opertional efficiency and flexibility of the firm, creating more benefits for the combined firm.In addition, decreasing of risk through geographical diversification, tax benefits, currency differentials could be the possible antecedents of value creation for the bidding firms.

Emerging market players, more often, venture into cross-border acquisitions with a desire to build and improve their competitive advantage and seek strategic and knowledge based resources. Such strategic skills and capabilities including technical know-how, superior management skills, innovative attitude, advance technology, established distribution channels and natural resources are ingrained in the people, national and organisational culture and community of the host nation.

Ghemawat (2001) has opined that the quality of assets available in a country is directly proportional to the level of economic development of that country. Hence, acquiring a firm located in advanced

economies generates higher value for the bidders'shareholders. Furthermore, developed markets are characterizied by stringent investor protection laws (Bhagat et al.,2011), higher governance standards (Martynova and Renneboog, 2008; Khanna and Palepu, 2004), low levels of corruption and higher institutional development; encouraging acquirers to bootstrap themseleves to higher standards, thus producing positive wealth effects for the shareholders.

The study is expected to provide invaluable insights to the management of firms from emerging economies in general and Indian firms in particular in the context of their overseas expansion strategies. Moreover, it can also have implications for the government and policy makers of emerging economies while drafting regulations for outward foreign direct investments.

The study is restricted to the analysis of overseas transactions by Indian companies only. Moreover, the focus of the paper is limited to the returns accruing to the acquiring firms only. This academic work can be extended to a larger number of emerging economies to throw more light on the pattern of risks and returns involved for the acquirer as well as the target firm.

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December 11-13, 2017
Delhi School of Management, Delhi Technological University, Delhi
pp. 109-115

Relevance of Flexible Business Applications for Organizational Sustainability in Rapid Changing Business and Technological Environment

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Abstract

In today's time, a business application is the backbone of any organization and dependency of organizations on information provided by these systems is too high. In rapid changing business and technological environment, flexibility of business applications appears to be one of most relevant factor for organizational sustainability (financially and socially). In this paper, a linkage between flexible business applications and organizational sustainability under an environment consisting of rapid change in technology and business practicesis developed and discussed. It is attempted to find out the factors pertaining to relevance of flexible business applications to organizationalsustainability. This paper also aims to discuss applicability of results of this research on business applications closely linked with emerging technologies such as big data and cloud etc., hence provide scope of future research.Findings are supported with a review of literature regarding business applications flexibility, greater focus has been given to derivation of relevance of business application for organizational sustainability.

Keywords: Business applications, Business environment, Flexibility, Information systems, Organizational sustainability, Technological environment

1. Introduction

In this paper, Relevance of flexibility of Business Applications for organizations will be discussed to make organizations sustainable financially and socially over a period of time. Scope of flexibility will be limitedto parameters such as business application requirement, business application usage, and business application change. In this study scope of sustainability is limited to social and economic sustainability in rapid changing business and technological environment. We are considering rapid changes in business and technological environment as in today's time business process changes very fast and technological life cycle is becoming too short. In most of the organizations, most of their business applications are not sustainable in long run. These applications lack flexibility in terms of business application requirement, business application usage, and business application change. Most of the time business applications are not directly linked to sustainability. Business applications are not flexible enough to cater the need of time with respect to rapid change in business and technological environment. Business applications are vulnerable to change in organizational processes. Due to these issues most of the time

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business applications lost their relevance in organizations and not able to provide return on investment. Looking into these issues, attempt will be made to achieve relevance of flexible business applications to organizational sustainability through literature review.

2. Research Methodology

This paper lists and discusses various parameters related to relevance of flexible business systems to organizational sustainability. Relevant data will be gathered from various research papers already published. Various journals like IEEEXplore, Emerald, Springer and Communications of the ACM websites have been searched with keywords like 'Business Applications', 'Information Systems', 'Organizational sustainability' etc. Efforts will be made to select research papers relevant to Information Systems, Flexibility and Organizational sustainability.

'Flexible Business Applications', 'Organizational sustainability', 'Changing Business and Technological Environments' are described in detail and a relation drawn between 'Flexible Business Applications' and 'Organizational sustainability'. We derive and discuss parameters of relevance of flexible business application to organizational sustainability.

3. Literature Review

There has been considerable amount of research already been done in area of flexibility of business applications and organizational sustainability. Some research has been done to define flexibility of organizations and much research has been conducted on Organizational Sustainability. While conducting this review, rapid change of business and technological business environment is considered. In this article, Parameters of flexibility and sustainability is collected and will organizes under rapid changing business and technological environment. Attemptsare made to derive a relevance of flexibility of Business Applications for organizational sustainability.

Different means can be drawn from the flexibility concept, and it is vague in nature (Golden& Powell,2000). An organization entity such as any area of organization or Information Systems or even organization may see flexibility as inherent property (Golden & Powell, 2000). There are various other views possible. So, it is very important to describe flexibility very clearly. In next section, we will define flexibility for this paper. A framework has been developed by Jacome (2007) which features characteristics of components which determines flexibility. IS Flexibility has been defined in four dimensions i.e. People, Process, IT and Data by this framework. Each four dimensions have various characteristics(Jacome, 2007). This model has been modified by Byrd, Madariaga, Byrdand Mbarika (2010) and more refined characteristics have been added for four dimensions.Characteristics modified by Byrd et al. (2010)are presented in Table 1:

Table1: Characteristics of Four Dimensions

People	Process
Communication Skills ,Skills- Capacities, Business Knowledge, Work related Issues, Change Oriented Managers, Business Unit teams, Positive change attitude , Constraints	Planning, Governance, Complete Specifications, SimpleImplementation procedure, Global vision, Open Documentation Issues in process redefinition, Importance of process
IT	**Data**
Standards, Software Issues, Type of Software, IT Management, Documentation, Third party software advantages, Systems Integration, Project Management, Software Interface Management	Data Definition availability

Source: Byrd et al. (2010)

Flexibility to use, flexibility to change an information system has been defined by Gebauer andSchober (2005) and discussed together with business process characteristics parameters such as uncertainty, variability and time-criticality. A systematic review of Information systems flexibility has been done (Anwar, Masrek &Sani, 2017) and technology adoption from ERP point of view has been discussed by Joseph, Nwankpaand Roumani (2015).Li and Yin (2007)have developed conceptual frames and models of measurement of the Information systems strategic planning flexibility.

Nyström andMustaquim (2015) discussed three types of indicators related to sustainability for business applications i.e. Social, Environmental and Economic. Social indicators are Social Equity, Increased error tolerance, diversification approach, user satisfaction, cumulative contentment, social transparency and Economic indicators are Energy consumption, risk selection, stakeholder's gap reduction, error reduction, productivity increase, Organizational structure merging.

Piotrowicz and Cuthbertson (2009) built sustainability framework on three dimensions namely social, economic, and environmental and then further divided in to some sub-dimensions, i.e. social dimensions have health and safety, noise and employees sub-dimensions; economic dimension has quality, efficiency, and responsiveness sub-dimensions; environmental dimension has emissions, natural resource utilization, waste and recycling sub-dimensions.

Colbert and Kurucz (2007) defines sustainability as "keep the business going", while other term which is used in similar context refers to "future proofing" of entities or organizations.

Organizations use business applications mainly for administrative usage, such as accounting. These systems are usually integrated with other applications. Purposes behind use of business applications are to achieve strategic goals such as standardization of organizational sites (Glowalla & Sunyaev, 2014).

Business applications focus two main goalsof an organization, i.e. core competencies, and strategic flexibility. It suggests that Information Technology support deployed for core competencies has ability to influence an organization strategic flexibility, hence will lead to superior organizational performance. This provides organizations with insights into the real value of Information Technology support needed for core competencies and perform better (Chen,Wang, Nevo, Benitez & Kou, 2017).

Organizational sustainability also depends on culture of the organization, and to study the culture is difficult due to its dynamic nature; thus the impact of culture is neglected in Information Systems research (Geeling, Brown & Weimann, 2016). Every Organization has a positive image for sustainable practices (Colbert & Kurucz, 2007).

Some of the major organizations in the Information Technology and Information systems Industry have started considering sustainability problems and issues. It can easily be seen that organizations are changing their approach towards Information Technology and Information Systems (Pamlin & Thorslund, 2004). Organizations should start concentrating to generate following opportunities such as producing environmental benefits and positive social and economic effects, to establish their clear goals, clear and transparent communication, business and export opportunities, potential for future development; all these areas to be integrated with IT closely to attain sustainable development (Pamlin & Thorslund, 2004). These systems need to be secure from various concerns related to information security (Singhal & Kar, 2015).

Today's external environment in which organization and business operate is rapid changing and technology life cycle is becoming very short day by day. Our way of doing business is being

changed by digital revolution, i.e. technological change, and only handful leaders are able to understand the scale of this change. The changes in Consumer and retail industry will be more in coming 20 years than during last 200 years (Morrison, 2017). Bray (2017) suggests that companies should avoid digitization without thinking of their organization business model. Many organizations solely focus on Information Technology, and they miss on their primary point, which is the requirement of new business processes.

4. Discussions

After looking in to the literature review, we list the parameters of Flexible Business Applications as below:

Business application requirement: -before selecting an application we should ask certain questions?

- Do we really need a system? Or it is just a "Nice to have" requirement?
- Which organizations function it should cover?
- What will be return on investment on business applications?
- Will integration with other systems needed?
- Whether to adopt open source or licenced technology?
- Is my Organization's culturereadyto adopt any business applications?

If answer to most of the questions is yes or positive, Organizations must go for the business application. If answer is no, then organizations need to re-think and first prepare themselves to adopt any business application in order to make the decision fruitful.

Business application usage: - To attain flexibility Business application usage is defined in such a way so that it supports flexibility. This has to be evaluated on the people, process and technology part (Byrd et al., 2010).Characteristics of usage may be defined as:

- User Interface
- Availability on Internet
- Secure application
- Fast, Easy to use and self-explanatory
- Accessible through mobiles, tablets etc.
- Provides Business Intelligence reports
- Provide analytics support
- Integrated with existing applications and able to integrate with new applications

Business application change: - Change in any business application can be considered one of the most important aspects of flexibility of business application. Some of the characteristics of business application change are:

- Frequency of change needed
- Magnitude of change needed
- Change adaptability of the system
- Change process
- Cost of change in terms of people, process, and technology
- Trainings

Now two types of sustainability can be defined:

1. Social (Health, Safety, Employees, Society etc.)
2. Economic (Quality, Efficiency, profit etc.)

Although there the concept of environmental sustainability also exists, but we have limited our scope to social and economic sustainability only.All business application opted for organizations should promote Social and Economic Sustainability.

Flexible business application's relevance to organizational sustainability is defined on three parameters:

I. Strategic

II. Operational

III. Communication

Any flexible business application must support Organizational sustainability on these parameters. Figure-1 represents relevance of the flexible business applications relevance to organizational sustainability.These business applications and organizations works in highly changing business and technological environment.

I. Strategic:- Strategic relevance means relevance to the strategic decision making. Whether system is flexible enough to provide a genuine support for a strategic decision making in order to achieve social and economic sustainability. Business application needs to be flexible in people, process, and technology that enable support for executive management. Strategic relevance is primarily useful for:
   - Long term decision making
   - Impacting all or most of the organization
   - Contribution to organization profit and society

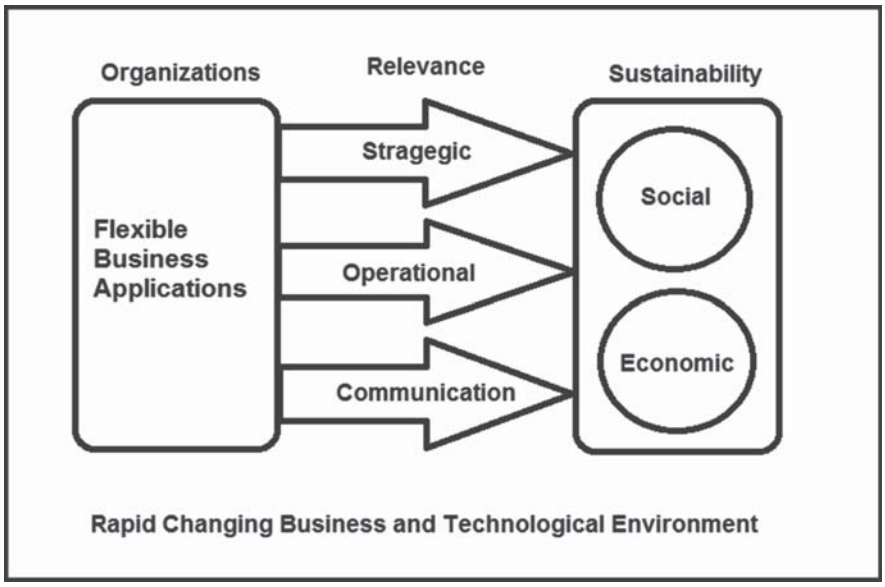


Figure 1: Relevance of Flexible Business Applications to Organizational Sustainability

II. Operational

Operational relevance of flexible business application means how it could be beneficial for its employees and internal process, how will it improve effectiveness of processes and improve organizational efficiency? Operational relevance of business applications provides a path to sustainability by providing:

- Process improvement
- Employee satisfaction
- Organization efficiency
- Organization Integration

III. Communication

Any flexible business application must be able to provide a tool for communication within and outside the organization and it should promote two-way communications. It actually helps at Strategic and Operational both levels. Communication plays an important role in improving organizational sustainability on both the areas, i.e. social and economic.

5. Concluding Discussion

In today's fast changing world for business and technology, a lot of research has been done on organizational sustainability, a little has been done to relate it to business applications flexibility. We tried to drive a relevance of flexible business applications with organizational sustainability. In this study, we have derived three parameter of flexible business application relevance to organizational sustainability i.e. Strategic, Operational, and Communication. If this relevance is discussed prior to implement or change business applications, a higher sustainability may be achieved, and failure or business applications may be reduced.

The outcome of this research may further be extended for taking case of latest technologies such as Big data (Babbar, 2017), Cloud, Internet of Things, etc. and hence provide a big scope of future research. Relevance of adopting Big data, Cloud like technologies may be derived for an organization.

6. Recommendation

After thorough analysis of literature, and by providing our relevance parameters for Organizational sustainability. We recommend that an organization, in order to achieve social and economic sustainability, must do a relevance test for its organizations. Organizations should not blindly follow others and adopt business applications. It will reduce failure of business applications and will provide better return on investment to organizations. Business application may be used as a tool to increase sustainability along with improving efficiency and increasing competitiveness. It will help organizations achieving better employee satisfaction, internal process effectiveness, organization efficiency. Last but not the least, organization capability to achieve its vision by deploying a flexible business application will enhance by means of various data analytics and business intelligence reports.

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Delhi School of Management, Delhi Technological University, Delhi
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Total Interpretive Structural Modeling (TISM) of the Determinants of Non-performing Assets in India Banking Sector

Noor Ulain Rizvi[1], Smita Kashiramka[2] and Shveta Singh[3]

Abstract

India, with one of the largest banking networks is currently facing a major problem of mounting non-performing assets (bad loans/stressed assets). In view of the role the banking sector plays in economic growth of the country, it is important to unearth the causal factors and mitigate the risks involved. The study fills a major gap in the literature by identifying the drivers and determinants of NPAs by building a hierarchical model.

The study first identifies the determinants from the existing literature then uses a thematic analysis to identify the major factors. These factors are then used to build a hierarchical structure using Total Interpretive Structural Modeling (TISM).The socio-cultural factors and the internal factors affecting the borrowers are found to be the dependent factors, whereas the economic conditions and the political factors are the major drivers. The study also finds the interlinkages between the environmental conditions, legal framework, internal factors related to respective banks, ownership pattern, adherence to regulatory framework and technological factors.

The study aims to identify the drivers and dependents of the determinants of NPAs which would act as a scaffolding for policy makers as well as bankers. Based on these findings, better instruments and mechanisms for recovery/management of stressed assets can be put in place.

Keywords: Total interpretive structural modelling (TISM), Non-performing assets (NPAs), India, Banking.

Introduction

"Banking is a very treacherous business because you don't realize it is risky until it is too late. It is like calm waters that deliver huge storms" - Nassim Nicholas Taleb(2008)

India's banking system, one of the largest banking networks in the world, has witnessed a dynamic period of growth and reforms over the last two decades. The present banking structure has evolved continuously after liberalization with deregulation of interest rates, dilution of government stake in public sector banks and a monumental increase in the market share of private sector banks.

Banking sector is often referred to as the stimulus for a country's economic growth; it is considered as the backbone of an economy as it enables the process of channelizing funds from the surplusunits sectors to the deficit sectors in the economy. It provides resources to

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capital intensive sectors and acts as a lubricant to the wheels of economic development. Due to this dependence, the overall growth of the economy is highly correlated with the health of the banking industry (ASSOCHAM, 2014).In emerging economies like India, the banksnot only act as agents of financial intermediation but alsoassist in the governments' social programs.

Although the Indian banking industry has expanded considerably in the past, the present status indicates that the problem of credit risk has engulfed the sector. This problem,if not managed and mitigated, may transform into a vicious cycle which will erode the banks net worth. The literature has empirical evidences that the banks have succumbed to mounting NPA pressure that has affected the long-term sustainability and growth. Indianbanks reported 9.20 per cent of its assets as stressed or bad in 2016 (World Bank database). The major reason for this as observed by Rajan (2017)is the way in which these stressed assets are dealt with.The worst way to handle distress assets (NPAs) is to 'extend and pretend', anticipating a 'miracle' to recover such loans or hoping for 'an act of God'.According to Rajan, the public perception about this problem relates to mainly the widespread corruption,irrational exuberance, tolerance for high promoter leverage, slowdown in government permissions, mindset of bankers and lack of instruments for recovery.

Though, there is a plethora of research on the determinants of NPAs both in India and worldwide, the problem still exists. Most of the earlier studies focus on the determinants in isolation ignoring the impact that they may have on each other. This study aims to analyze this problem from a fresh perspective by identifying the interlinkages and dependence among these determinants. The study employs a widely recognized tool, TISM to build a hierarchical structure of the determinants of NPAs,which according to the authors is a pioneering work in this area. The study aims to identify the drivers and dependents that would act as a scaffolding for policy makers as well as bankers. The socio-cultural factors and the internal factors affecting the borrowers are found to be the dependent factors, whereas the economic conditions and the political factors are the major drivers. The study also found the interlinkages between the environmental conditions (natural calamities, floods, famines and earthquakes etc which are important in the Indian context) and the factors influencing banks and borrowers.

The main objectives of the study are

- to identify the determinantsofnon-performing loans; and
- to develop a total interpretive structural model of determinants of non-performing loans in the Indian banking sector.

The structure of the paper is as follows: Section 2 describes the concept of non-performing loans followed by the findings of recentliterature related to the factors influencing non-performing themin the banking sector,nationally as well as globally. Section 3 presents the methodology; identification of factors related to determinants of non-performing loans in the Indian context and describes the research methodology used for development of the model. Section 4 explains the model, Section 5contains the results. Section 6synthesizes the learning and sets out some recommendations for practitioners as well as academics and section 7 concludes.

Literature Review

The decades of 60s and 70s were marked by nationalization of most banks in India and the balance of payments crisis is considered as its major fallout. These events eventually triggered India towards liberalization and a need for remodeling the country's financial system was felt. Narasimham Committee (1991) identified NPAs as one of the possible causes for the malfunctioning of the public sector banks (PSBs). Thus, in order to put a check on the NPA problem, the committee recommended banks to publish the magnitude of NPAs on an annual basis.

What are NPAs?

According to the latest definition by Reserve Bank of India (RBI)(2015), an asset, including a leased asset, becomes non-performing when it ceases to generate income for the bank.

"A non-performing asset (NPA) is a loan or an advance where;

i. interest and/or instalment of principal remain overdue for a 'specified' period of more than 90 days in respect of a term loan,

ii. the account remains 'out of order', in respect of an Overdraft/Cash Credit (OD/CC),

iii. the bill remains overdue for a period of more than 90 days in the case of bills purchased and discounted,

iv. a loan granted for short duration crops will be treated as NPA if the instalment of principal or interest thereon remains overdue for two crop seasons.

v. a loan granted for long duration crops will be treated as NPA if the instalment of principal or interest thereon remains overdue for one crop season."

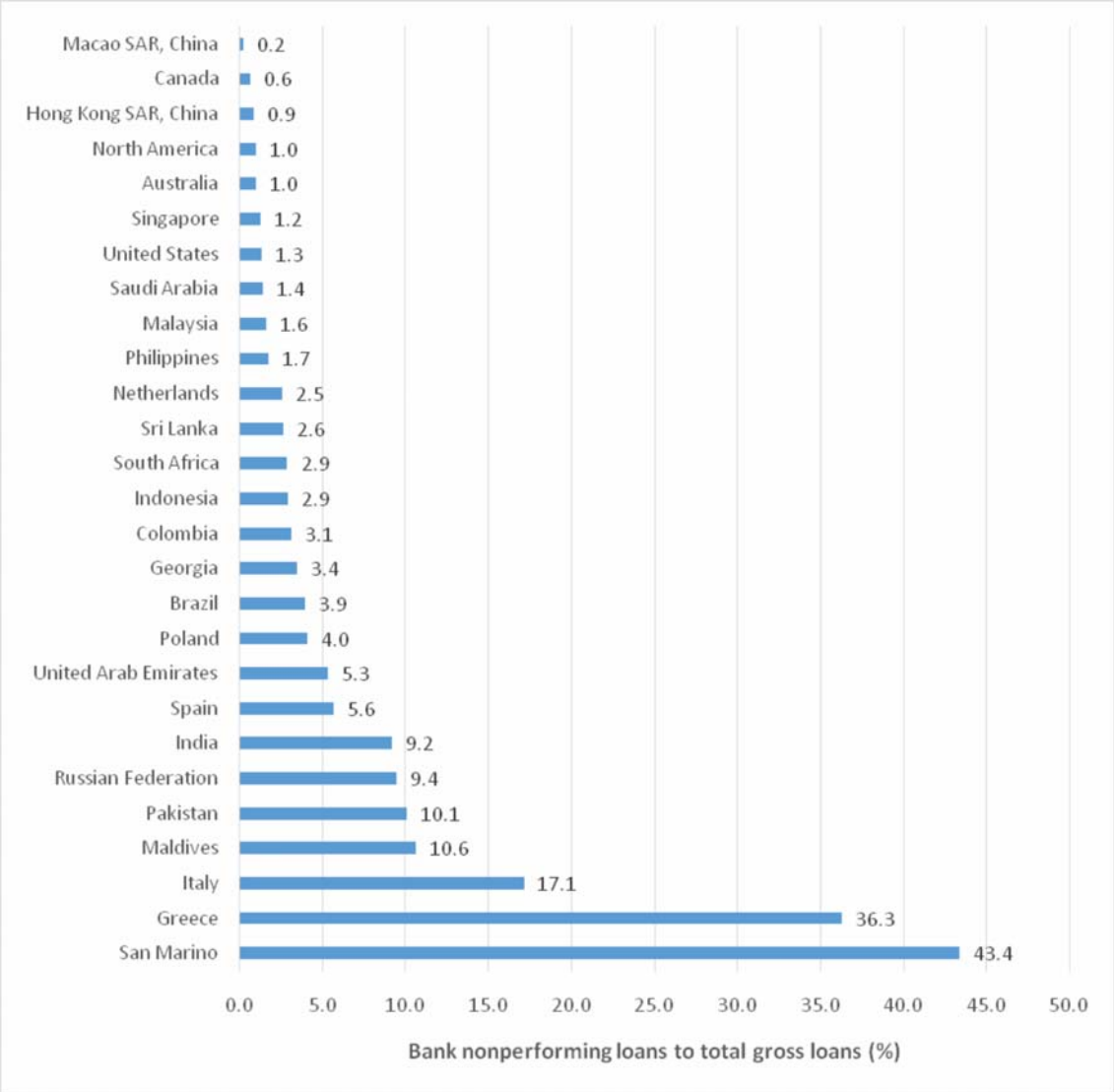
However, this definition has been subject to several amendments in the past;for the year ending 31 March 1993 the 'specified' period was four quarters instead of the present 90 days period. Subsequently, this 'specified' period was reduced to three quarters in 1994 and two quarters in 1995 in a phased manner. In order to be consistent with the international best practices and to ensure greater transparency, this 'specified' period was reduced to 90 days from the year ending March 31, 2004(RBI, 2001).

Categories of NPAs

The Narasimhan Committee (1991) suggested that based on the time period and realisability of the dues on the assets, the banks and financial institutions should classify their assets by compressing the health codes into four broad groups namely Standard assets, sub-standard assets, doubtful assets and loss assets.

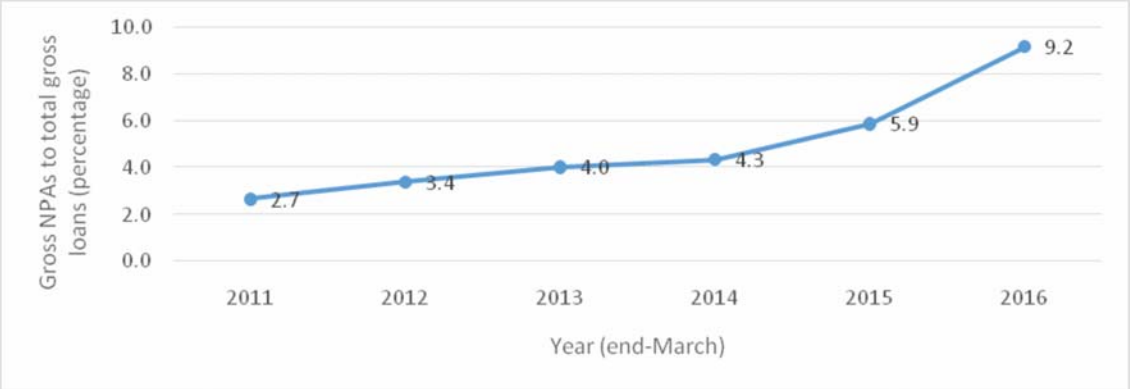
In order to understand the gravity of the problem of NPAs in the Indian banking industry, it is important to understand the global scenario. Since, NPAs gained substantial attention only in the post reform era, it would be useful to look at recent figures rather than adhere to a historical account. According to the recent data by World Bank, San Marino (43.40 per cent) and Greece (36.30 per cent) are most affected by the problem of NPAs. This problem is one of the main reasons behind the low aggregate profitability of European banks. Asset quality issues have been brought to the fore by the global financial crisis (GFC). In the euro area, NPA ratios stood at low or manageable levels prior to the crisis. At the same time, the root cause of NPA is related to structural issues that were further amplified with the start of the financial and economic crisis. In fact, the surge in NPAs further revealed the limited ability of large parts of the euro area banking system to deal with distressed debt (Constâncio, 2017). On the other hand, Canada being the least affected by the problem of NPAs, is rated the best banking system in the world byMoody's Investors Services for itsfinancial strength and safety. Apart for this, the World Economic Forum has also declared Canada's banking system the best in the world for seven years running as none of the Canadian bank failed or required a bailout during the GFC (India ranks at 75th position) (Schwab, 2016). India has a net NPA ratio of 9.20 per cent which is moderately high. Figure2 indicates the trend of NPA in the Indian banking industry post the GFC.

Discussion on the trend of NPAs in the Indian banking industry



Source: World Bank database

Figure 1: Trend of NPAs in banking systems globally



Source: World Bank database

Figure 2: Trend of NPAs in the Indian banking industry

The systematic data on NPAs became available for analyzing only in 1998 after the second recommendations of the Narasimhan Committee(Rajeev and Mahesh, 2010). The trend of NPAs in the Indian banking industry is rather alarming and regulatory changes and interventions are thus needed urgently. The NPA levels in 2011 were recorded at 2.70 per cent which have significantly increased to 5.9 per cent in 2015 and subsequently 9.20 per cent in 2016. As on December 2016, these non-performing loans (approx. Rs. 10 lakh crore in value) were almost equivalent to 7 per cent of India's Gross Domestic Product (Ray , 2017). The then, Reserve Bank of India governor, Raghuram Rajan stated that the 'overall economic downturn' was the major cause for the rising NPAs(The Hindu, 2016). Poor project evaluation, extensive project delays, poor monitoring, cost overruns, and the effects of global overcapacity on prices and imports are also some setbacks for asset quality(Rajan, 2016). The growing NPAs are a fallout of the policies to uncover the problem (asset quality review). The banking industry earlier was constrained by collective reluctance to recognize the problem(Rajan, 2017). Now after the constant interference by RBI and implementation of stricter regulatory norms of Basel, the problem has been uncovered and eventually will be mitigated by due diligence and proper mechanisms/ instruments to deal with distress.

The fifteenth edition of RBI's biannual Financial Stability Report (RBI, 2017)has cautioned that the gross bad loan ratio of Indian banks which was 9.60 per cent in March 2017 will rise to 10.20 per cent of the total loan book in March 2018. In the disclosures in March 2017, banks reported very high ratios of gross NPLs to its total lending. Indian Overseas Bank being the worst at 22.39 per cent followed by IDBI Bank at 21.25 per cent, Central Bank at 17.81 per cent, Bank of India at 13.22 per cent, Punjab National Bank with 12.53 per cent, Oriental Bank with 13.73 per cent, Dena Bank with 16.27 per cent and so on (Economic Times, 2017).

Drivers of NPAs: A historical perspective

The commonly used PESTLE framework (political, economic, social, technological, legal and environmental) to evaluate the NPA problem has undergone structural changes due to the dynamic nature of the banking system and the environment it functions in. After the reforms of 1991, the rapid pace of globalization and the advances in the information technology industry has induced economic integration and interdependence amongst nations and their banking sectors.

In the literature, there are plethora of studies about the problem of NPAs (also referred as bad loans/ stressed loans and NPLs). This section represents a synthesized view of some of the

significant researches to develop insights about the drivers/determinants of NPLs across the world. Reddy (2004) examined the issues related to the terms of credit in the Indian banking industry and considered banks' lending policy as an important driver of NPAs at banks. He also pointed out that default cannot be clearly classified as a rational decision. In fact, a probabilistic assessment of costs and benefits is done by the defaulter. Mohan (2003) conceived the term 'lazy banking' while reflecting critically on banks' investment portfolio and its lending policy, further in Mohan (2004) emphasis was placed on terms of credit such as maturity and interest. These two studies provided the factor (banks' lending policy) that is well accepted in the literature globally (McGoven (1993); Meacci (1996); Bloem and Goerter(2001)).

The seminal study byReddy (2004) observed a number of critical issues related to the credit delivery mechanism in the banking system of India. The work focused on terms of credit (interest), risk management approaches and management of portfolio. In the past the credit system of India was based on three pillars namely, fixing the interest rates as well as quantum of credit, emphasizing on collateral, and specifying the end-use of credit. In the recent period, it is observed that fixing the rates of interest and quantum of credit has been done away with. The study also emphasized the issue of collateral lending specifically in the service sector.

Furthermore, in the context of NPAs with regards to the lending to the priority sector, there may be a marginal difference between the loan given to the two categories of borrowers (priority and private). The study also suggested that lending should be based on sound financial and economic decisions rather than any conventional system. Meacci (1996) in a study of Italian banks observed that the riskiness of an asset is strongly rooted in the bank's lending policy which can be further adduced to the inadequate scrutiny of sectoral prospects.

The study by Mohan (2004) stressed that public sector banks had a relatively higher interest rate spread along with lower rate of returns, reflecting higher costs of operations. The study also mentioned that asset quality was poor coupled with higher loan loss provisions. Thus, operating costs and inefficiency at the bank is recognized as a one of the determinants of NPAs at bank. In the context of Indian banking, Rajaraman and Vasistha (2002) provided empirical evidence of a significant bivariate relationship between the problem of bad loans in the public sector banks and operating inefficiencies.

Another important aspect covered by the literature is that of tenure of funds provided by the bank in terms of loans or investments. The deposit liabilities of a bank often have a relatively shorter maturity than its assets (i.e., loans and other lending); which in-turn induces the problem of asset liability mismatch (Ranjan and Dhal, 2003).

Muniappan (2002) observed various internal and external factors related to the borrowers.The internal factors confronting the borrowers such as diversification of the loan amount for expansion or modernization, taking up new opportunities or projects, time overruns, cost overruns during any stage of the project, business failures (product failures), inefficiency in management, weak or stressed labour relations, inappropriate technology or obsolescence etc.

The external factors are similar to systematic risks such as economic slowdown, recession, non-payment by other countries, power shortage, price escalation, natural calamities etc. On the other hand, Das and Ghosh (2003) stated the facts from the lenders' perspective. Their study empirically examined NPAs of public sector banks in India with regards to the asset size, credit growth, operating efficiency and various other macroeconomic conditions.

In a study of US banks, McGoven (1993)argued that a behavioral aspect, 'character' was a major determinant in lending decisions. The study suggested that the banker must consider the following aspects through personal interactions and establish an accurate personality-morale

profile of the prospective borrowers and guarantors. The aspects such as staff morale, loyalty, historic credit reports from current and previous bankers, trade-credit reference check through market interaction, stress management etc. However, in the current time period, the banks are much more technological advanced and use sophisticated tools such as CIBIL scores, for assessing the borrowers' credit capacity. It is important to note that the use of CIBIL score is still in a nascent stage.

Bloem and Goerter (2001) reported that it is likely that NPAs are caused by a number of 'wrong economic decisions' by individuals and sometimes even by 'badluck' (uncertainweather conditions, unexpected price change*etc.*). The study suggested that the businesses can mitigate or hedge the risk by making provisions and taking insurance; the cost of which is borne by the customers. Similarly, the financial institutions include risk premium of uncertainty in the interest rate while lending.

In a study of Chilean credit market, Fuentes and Maquieira (1998) examined different factors that affect the loan repayment. The empirical analysis suggested limitations in accessing credit, macroeconomic stability, information sharing, techniques of collection, bankruptcy code, judicialsystem, prescreening mechanism and major changes in the financial market regulations as the important determinants. In another study, the same authors(Fuentes and Maquieira, 2003)analysed time series data (1960-97) of Chilean banks and concluded that information sharing, deep financial market liberalization and other legal reforms were important aspects of the credit market developments.

De Lis, Pagés and Saurina (2001) emphasized the role of GDP growth rate, debt-equity ratio of the borrowing firms, market regulation structure, loan growth, growth rate of bank branches, bank size, collateral loans, net interest margins, market power and capital-asset ratio as indicators of bank loan losses (NPAs).

After the GFC new variables for explaining the problem of NPAs have emerged in the literature. For instance, Misra and Dhal (2010) focused on business cycles for investigating the NPA problem. De Bock and Demyanets (2012) opined that 'herd behaviour' of bank managers;leniency during the economic booms phase can deteriorate the credit standards. Another study byAggarwal and Mittal (2012), ascribed improper selection of borrowers' activities, weak appraisal system of credit, industrial problems, management inefficiencies, inadequate credit management, monitoring and follow up, natural calamities and other uncertainties. Lokare (2014)investigated the macro-financial linkages of the asset quality phenomenon. The main factors used in the study were credit growth, GDP growth and interest rate cycles, inflation, asset prices and world GDP growth.

From the literature reviewed above, it can be synthesized that there is a plethora of literature regarding the factors or variables that are likely the determinants of NPAs. However, studies lack focus on the possible links between these variables. Thus, in this study, the authors attempt to overcome this serious limitation by structuring the existing knowledge from the literature; by classifying the factors as drivers and dependent. The study enables to understand the interaction between the leading and lagging indicators and further builds a model using a structural technique to identify linkages; direct as well as transitive between these variables by taking opinions from the experts in this domain.

Methodology

TISM Concept

The philosophical basis for the development of the Interpretive Structural Modeling (ISM) approach(Warfield, 1973c) and the conceptual and analytical details of the ISM process (Warfield

(1974a); Warfield (1976); Warfield (1994) and Warfield (1999)) are applied widely by many authors. The Total Interpretive Structural Modeling (TISM) technique (Sushil, 2012) is an innovative extension to the widely accepted ISM technique. In this technique, weakly articulated mental models are transformed into systematic forms. Importantly, the technique does not add any new information to the existing pool of knowledge, but enables in developing a hierarchical structure of the variables. The TISM technique uses systematic iterative application of graph theory to interpret embedded objects; resulting in a directed graph for the complex system amongst the set of variables. Due to the value addition and its simplicity this technique has been widely used in different fields of research including Nasim (2011); Prasad and Suri (2011);Wasuja et al. (2012), Srivastava and Sushil (2013); Sahdev et al. (2014);Yadav and Sushil (2014); Jena et al. (2016). In fact another extension of TISM, 'fuzzy TISM' has also been used in the literature by Khatwani et al. (2015) andMohanty and Shankar(2017).

In the literature, three main techniques, namely Interpretive Structural Modeling (ISM), Analytic Network Process (ANP) and Analytic Hierarchy Process (AHP) are used for modeling and multi criteria decision making (MCDM) in different areas. Structural models can be developed to identify the relationship between the variables of interest which help in understanding the structure of the system better. Keeping this in mind, the TISM methodology has been adopted here as it not only allows for developing hierarchy and links, but also provides the interpretation of these links.

Identification of factors causing non-performing assets

Despite identifying the factors related to non-performing loans from the literature, semi-structured interview with the senior level bank officials are conducted to understand the factors from the practitioners' viewpoint. For this study, thematic content analysis is used which is a qualitative data analysis method. It is a method for "identifying, analysing and reporting themes within data" (Braun and Clarke, 2006). The themes generated from the analysis are treated as factors influencing the non-performing loans. The thematic analysis led to the identification of the following factors:

TISM development

An ISM enables in interpreting the links in terms of the contextual relationship between each pair of factor, and also the direction of their relationship. However, there is a need to further interpret the reason behind these links. TISM makes this possible for the researchers by answering "why" a certain link exists.

TISM (modified) methodology

The TISM technique adopts almost all central steps of ISM, i.e. reachability matrix and its partitions. The modified TISM addresses the challenge of a large number of pair comparisons and cumbersome transitivity checks on the reachability matrix. The nine-step process of TISM is briefly presented below.

Step I: Identify and define elements

The elements for modelling in the study are the factors related to the non-performing assets and are identified through literature review and classified into themes using a semi-structured interview with experts.

Step II: Define contextual relationship

To develop the structure, it is important to define the contextual relationship between the variables/ factors of interest. Here, the relationship identified between the factors is attribute enhancement, i.e, "Factor A will influence or enhance Factor B"

Factor Code	Factor Description	Evidence from literature
C1	Political factors such as political instability, trade restrictions, priority sector lending, frequent transfers of officials, corruption etc.	Rajanand Dhal (2003), Bhide et al. (2003), Das and Ghosh (2002), Breuer (2006)
C2	Environmental conditions such as natural calamities; floods, earthquake, droughts, etc.	Rajanand Dhal (2003), Bhide et al. (2003), Das and Ghosh (2002), Muniappan (2002).
C3	Ownership pattern that is, whether the bank is publicly owned, privately owned, a subsidiary of a foreign bank etc.	Hu et al. (2004), Micco et al. (2007), Salas and Saurina (2002)
C4	Economic factors such as inflation, GDP, exchange rates; which influence the spending habits of individuals/corporates. Other globalization induced factors such as liberalization and deregulations.	Rajanand Dhal (2003), Bhide et al. (2003), Das and Ghosh (2002), Muniappan (2002), Ghosh (2015), Bercoff et al. (2002), Altman et al. (2001), Thiagarajan et al. (2011), Louzis et al.(2012), Cifteret al. (2009), Nkusu (2011), Hofmann et al. (2006), Beck et al. (201 3), Breuer (2006) and Laryea et al. (2016)
C5	Socio-cultural factors mainly the underlying behavior and attitude of customers such as diversion of funds, helping/promoting other concerns, incalcitrant attitudes, willful defaults and unethical means of obtaining loans	Rajanand Dhal (2003), Bhide, et al. (2003), Das and Ghosh (2002), Reddy (2004), Gibson and Tsakalotos (1992), Breuer (2006)
C6	Internal factors related to respective banks such as inefficiency in management, insufficient monitoring and follow up, unethical practices in sanction of loans, lack of infrastructural facilities at the banks such as power supply and computerization, lending terms of credits, maturity, interest rates, collateralized lending, allowance of moratorium periods.	RajaramanandVasishtha (2002), Ghosh (2003), McGoven (1998), Thiagarajan et al. (2011), Louzis et al. (2012), Podpi era and Weill (2008), Larye et al. (2016), Reddy (2004), Mohan (2003, 2004), Meacci (1996), BloemandGorters (2001), Misraand Dhal (2010), Louzis et al. (2012), Bofondi and Ropele (2011), Beck et al. (2013)
C7	Technological factors which enable rapid exchange of information, creation of new products and reduction in transaction costs thus contributing to enhanced operational efficiency.	Rajanand Dhal (2003),Bhide et al. (2003), Das and Ghosh (2002)
C8	Internal factors confronting borrowers such as time and cost over runs of projects, business/ product failure, inefficient management, strained labor relations	Muniappan (2002), BloemandGorter (2001)
C9	Legal aspects such as bankruptcy norms, legal recourse, measures in the area of debt recovery, securitization, asset reconstruction, resolution of default, amendments in archaic laws, legislative laws.	Rajanand Dhal (2003), Bhide et al. (2003), Das and Ghosh (2002), Fuentes andMaquieira (2003), Breuer (2006)
C10	Lack of institutional framework adopting to international best practices pertaining to prudential regulation and supervision.	Misraand Dhal (2010), Klomp and de Haan (2014), Agoraki et al. (2011), Boudriga et al. (2009), Avijit (2015)

An example may be “Political factors will influence or enhance legal factors”.

Step III: Interpretation of relationship

This step gives TISM an edge over traditional ISM, as the former seeks an interpretation of the relationships. In this study, the contextual interpretation is “In what way will factor A influence or enhance factor B?”. This will help to achieve an in-depth knowledge explicitly.

Step IV: Interpretive logic of pair-wise comparison

An “Interpretive Logic-Knowledge Base” is generated for pair-wise comparison of the elements; each comparison may be answered by a Yes (Y) or No (N). If the answer is Y, further interpretation is necessary. The total number of pair-wise comparisons is (10* 9)/2 = 45, and the total number of rows is 10*9 = 90 for the factors.

Step V: Reachability matrix and transitivity check

The reachability matrix for the elements is prepared by writing 1 for the statements answered in Y and 0 if answered in N from the interpretive logic-knowledge base of the previous step.

This matrix is further checked for the transitivity rule (if A->B and B->C, then A->C). The knowledge base is updated as Y, in case a transitive link is obtained and “transitive” is mentioned against it in the interpretation column along with the meaningful reason (if any).

The final reachability matrix is obtained when no further transitive links are possible, shown in Annexure 2.

Step VI: Level partition on reachability matrix

Level partitioning is carried out similar to the ISM methodology. This provides levels to all the elements, shown in Annexure 5.

Step VII: Developing digraph

The elements are portrayed in the form of a directed graph, where the elements are arranged according to the levels, and relationships are portrayed from the reachability matrix. Those transitive links whose interpretation is crucial, are retained.

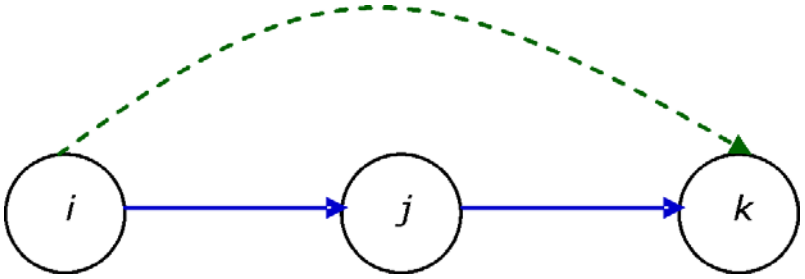
Step VIII: Interaction matrix

A binary matrix is developed by translating the final digraph using 1 to indicate direct and significant transitive links. It is further developed as an interpretive matrix by providing the relevant interpretation from the knowledge base, shown in Annexure 3 and 4.

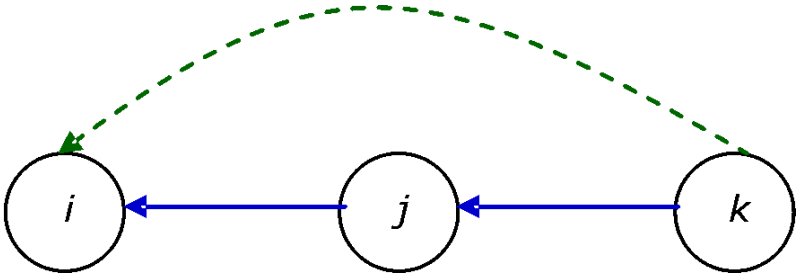
Step IX: Total interpretive structural model

The connective information from the digraph and interpretations from the interaction matrix are used to develop the TISM. The nodes in the digraph are replaced by interpretations provided in the interaction matrix. The TISM model for factors related to non-performing loans is shown in Figure 4.

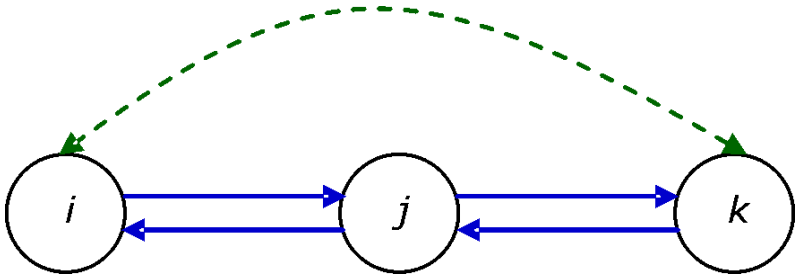
However, in the modified TISM approach (Sushil, 2017), the fourth and fifth steps are performed simultaneously; others steps remaining the same. The TISM approach has n(n-1)/2 i.e, (10*9)/2 paired comparisons. The modified approach reduces these paired comparisons significantly as transitivity checks are done in a sequential manner simultaneously; reducing duplication and redundancies. For instance,



a. Forward transitive relation *i-k*



b Backward transitive relation *k-i*



c Both way transitive relationship *i=k*



Figures (a), (b) and (c) are examples of transitive relationships that are forward, backward and both ways, respectively. In (a), had there been no link (that is, expert answered with a 'N') between *i to j,* the expert need not comment on the link between *i to k.* In (b), if there is no link between *k to j,* the expert does not have to respond to redundant link of *k to i.* In (c), if there is a both way relation between *i to j* and *j to k,* then it shows that there will exist a transitive link between *i to k* and *k to i.*

The correctness of the model is rechecked by applying the measures suggested by Sushil (2016).

Model

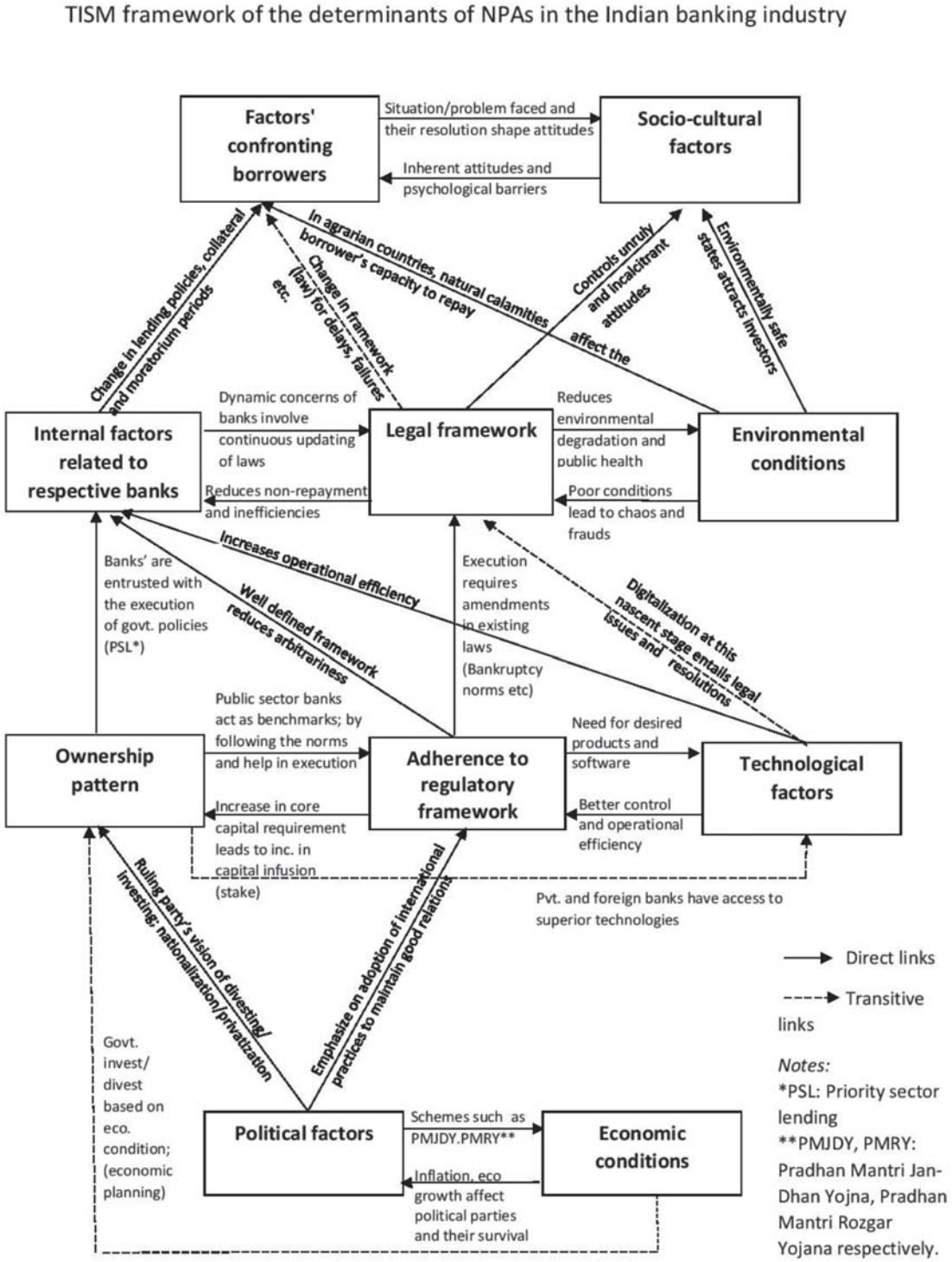


Figure 4: TISM framework of determinants of NPAs in the Indian banking industry

Results

Political factors (political instability, trade restrictions, priority sector lending, frequent transfers of officials) and economic conditions (inflation, exchange rates, unemployment, which influence the spending habits of individuals/corporates and other globalisation induced factors such as liberalisation and deregulations) are the main drivers of NPAs in the Indian banking industry.The two factors are related to each other; conditions of higher inflation rates among others affect the growth and survival of political parties. For instance, the current government's party manifesto before the elections stated that the party would set up Price Stabilisation Fund to keep inflation in control and pursue banking sector reforms to deal with the concerns of NPAs (Times of India, 2014). Relatedly, political factors viz schemes introduced by the parties such as PMJDY (Pradhan Mantri Jan DhanYojna) and PMRY(Pradhan MantriRozgarYojana) enhance job opportunities, financial inclusion, prosperity and economic growth (Govt. of India website, 2016).

The ruling party's vision and roadmap for development with regards to nationalization or privatization plays a key role in changing the ownership patterns of banks(Sen, 2016).The ownership pattern enhances the adherence to the regulatory framework. As adherence to Basel framework increases, the banks have to increase their tier 1 equity capital. However, most PSBs have to rely on external infusion as they cannot generate capital internally, largely due to their deteriorating asset quality. The government will thus infuse seventy thousand crores in PSBs over 2016-19, thus increasing its stake (Philip, 2016) .The ownership pattern also impacts the internal factors related to respective banks, as generally PSBs are entrusted with the execution of the public policies(Singh, 2016). These are passed on to the borrowers through subsidized interest rates, tenure, collaterals and moratorium periods.

Adherence to regulatory framework acts on twin fronts by enhancing the existing legal framework (through amendments and inclusion of new laws) and upgradation of technology (continuous need for new products and software). A well-defined framework reduces chances of arbitrariness. On the other hand, technological innovation increases digitalization and online maintenance of records, enhancing adherence to regulatory framework and increasing the operational efficiency at banks. Albeit, it is at a nascent stage and requires resolution of various entailed legal issues.

The factors confronting borrowers such as cost/time over run, obsolete technology/products, diversion of funds,etc, change and reshape the attitudes and psychologyof the people which enhances their socio-cultural attitudes. On the other hand, the socio-cultural factors define the inherent attitudes and psychological barriers determine their business choices and risk taking behavior. Environmental conditions also play an important role in shaping the attitudes of people; a condition of drought, flood or earthquake and the steps taken by the government has an important role in changing the behavioral dynamics(Cameron and Shah, 2015). These environmental conditions are also responsible for inability of farmers (especially) to repay their debts. The agricultural households of south India are the most indebted, exacerbated by additional loans taken to meet health issues. This diversion of funds diminishes their ability to invest in farming(Saha, 2017). In this regard, the RBI has allowed state and district level banks to take a tolerant view on rescheduling of loans if crop loss is 33 per cent or more apart from the government which has increased the target of agricultural credit from Rs 9 lakh crore to Rs10 lakh crore in budget 2017-18 (Rajagopal, 2017).

Managerial implications

The study has identified the interlinkages between the factors. Based on these relations and interlinkages, better instruments and mechanisms for distress recovery can be put in place. It

would enable the regulators to introduce corrective actions at the weak links which will enable a smooth execution of regulatory reforms and policies to check stressed assets timely.

Conclusion

This study highlights the interactions and interplay among the determinants of non-performing assets in the Indian banking sector. The hierarchical structures presented in the TISM portray the leading and lagging relationships among different factors. The study contributes to the knowledge of management by determining various factors, their interplay and inter-relationships, which will determine how the Indian banking industry will shape itself in coming times. From a methodological perspective, the study showcases the application of multiple methods combining qualitative and quantitative research tools and thus, it illustrates a mechanism that may be used to conduct exploratory study in the researcher's area of interest. The study can be further replicated in different contexts to examine the driver-dependent relationships among the variables of interest. Thus, the study can be viewed as a significant step in research related to Indian banking industry's most important problem in the current time period.

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Annexures

Annexure 1: Development of the TISM framework
Initial reachability matrix with direct links

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
C1	1	0	1	1	0	0	0	0	0	1
C2	0	1	0	0	1	0	0	1	1	0
C3	0	0	1	0	0	1	0	0	0	1
C4	1	0	0	1	0	0	0	0	0	0
C5	0	0	0	0	1	0	0	1	0	0
C6	0	0	0	0	0	1	0	1	1	0
C7	0	0	0	0	0	1	1	0	0	1
C8	0	0	0	0	1	0	0	1	0	0
C9	0	1	0	0	1	1	0	0	1	0
C10	0	0	1	0	0	1	1	0	1	1

Annexure 2: Reachability matrix with direct and transitive links

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	
C1	1	0	1	1	0	1*	1*	0	1*	1
C2	0	1	0	0	1	1*	0	1	1	0
C3	0	0	1	0	0	1	1*	1*	1*	1
C4	1	0	1*	1	0	0	0	0	0	1*
C5	0	0	0	0	1	0	0	1	0	0
C6	0	1*	0	0	1*	1	0	1	1	0
C7	0	0	1*	0	0	1	1	0	1*	1
C8	0	0	0	0	1	0	0	1	0	0
C9	0	1	0	0	1	1	0	1*	1	0
C10	0	1*	1	0	1*	1	1	0	1	1

Annexure 3: Interaction matrix (binary)

	Political factor	Environmental condition	Ownership pattern	Economic factors	Socio-cultural factor	Factors related to respective banks	Technological factors	Factors confronting borrower	Legal aspects	Adherence to regulatory framework
Political factors	X	0	1	1	0	1	1	0	1	1
Environmental conditions	0	X	0	0	1	1	0	1	1	0
Ownership pattern	0	0	X	0	0	1	1	1	1	1
Economic factors	1	0	1	X	0	0	0	0	0	0
Socio-cultural factors	0	0	0	0	X	0	0	1	0	0
Factors related to respective banks	0	1	0	0	1	X	0	1	1	0
Technological factors	0	0	1	0	0	1	X	0	1	1
Factors confronting borrowers	0	0	0	0	1	0	0	X	0	0
Legal aspects	0	1	0	0	1	1	0	1	X	0
Adherence to regulatory framework	0	1	1	0	1	1	1	0	1	X

Annexure 4: Interaction matrix (interpretive matrix)

	Political factors	Environmental condition	Ownership pattern	Economic factors	Socio-cultural factors	Factors related to respective banks	Technological factors	Factors confronting borrowers	Legal aspects	Adherence to regulatory framework
Political factors	X	0	Ruling party's vision	Schemes such PMJDY,PMRY**	0	1	1	0	1	Emphasize to maintain good relations
Environmental conditions	0	x	0	0	Attracts investors	1	0	Natural calamities affect capacity to repay	Poor conditions lead to chaos and frauds	0
Ownership pattern	0	0	X	0	0	Execution of govt. policies (PSL*)	Pvt. and foreign banks have access to superior technology	1	1	PSBs act as benchmarks; by following the norms
Economic factors	Inflation, etc. affect poli tical parties	0	Economic planning	X	0	0	0	0	0	1
Socio-cultural factors	0	0	0	0	X	0	0	Inherent attitudes and psychological barriers	0	0
Factors related to respective banks	0	1	0	0	1	X	0	Lending policies, collateral,moratorium periods	Concerns involve continuous updating of laws	0
Technological factors	0	0	1	0	0	Operational efficiency	X	0	Digitalization entails legal issues and resolutions	Better control and operational efficiency
Factors confronting borrowers	0	0	0	0	Problem faced shape attitudes	0	0	X	0	0
Legal aspects	0	Reduces environmental degradation	0	0	Controls unruly and incalcitrant attitudes	Reduces non-repayment and inefficiencies	0	Change in framework (law) for delays, failures etc.	X	0
Adherence to regulatory framework	0	1	Increase in core capital leads to inc. in capital infusion	0	1	Well defined framework reduces arbitrarines	Need for desired products and software	0	Execution requires amendments in laws (Bankruptcy	X

Annexure 5: Partitioning the reachability matrix into different levels

Iteration 1

Variables	Reachability set	Antecedent set	Intersection set	Level
C1	1,3,4,6,7,9,10	1,4	1,4	
C2	2,5,6,8,9	2,6,9,10	2,6,9	
C3	3,6,7,8,9,10	1,3,4,7,10	3,7,10	
C4	1,3,4,10	1,4	1,4	
C5	5,8	2,5,6,8,9,10	5,8	Level I
C6	2,5,6,8,9	1,2,3,6,7,9,10	2,6,9	
C7	3,6,7,9,10	1,3,7,10	3,7,10	
C8	5,8	2,3,5,6,8,9	5,8	Level I
C9	2,5,6,8,9	1,2,3,6,7,9,10	2,6,9	
C10	2,3,5,6,7,9,10	1,3,4,7,10	3,7,10	

Iteration 2

Variables	Reachability set	Antecedent set	Intersection set	Level
C1	1,3,4,6,7,9,10	1,4	1,4	
C2	2,6,9	2,6,9,10	2,6,9	Level II
C3	3,6,7,9,10	1,3,4,7,10	3,7,10	
C4	1,3,4,10	1,4	1,4	
C6	2,6,9	1,2,3,6,7,9,10	2,6,9	Level II
C7	3,6,7,9,10	1,3,7,10	3,7,10	
C9	2,6,9	1,2,3,6,7,9,10	2,6,9	Level II
C10	2,3,6,7,9,10	1,3,4,7,10	3,7,10	

Iteration 3

Variables	Reachability set	Antecedent set	Intersection set	Level
C1	1,3,4,7,10	1,4	1,4	
C3	3,7,10	1,3,4,7,10	3,7,10	Level III
C4	1,3,4,10	1,4	1,4	
C7	3,7,10	1,3,7,10	3,7,10	Level III
C10	3,7,10	1,3,4,7,10	3,7,10	Level III

Iteration 4

Variables	Reachability set	Antecedent set	Intersection set	Level
C1	1,4	1,4	1,4	Level IV
C4	1,4	1,4	1,4	Level IV

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Impact of Global Financial Crisis on stock market comovement in Europe

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Abstract

The purpose of this study is to analyze if global financial crisis had any impact on the evolution and determinants of stock market integration between developed and emerging markets of Europe. Such an analysis is throws light on the flexibility of European financial system. For this purpose, realized correlation and pooled regression is employed. The results indicate that stock market linkages strengthened during financial crisis. The three stages of crisis transmission i.e. contagion, herding and post crisis is identified in the study. Regression results indicate that during pre-crisis period, inflation rate differential drove stock market integration in Europe. However, in the post crisis period, stock market interdependence in Europe is explained liquidity. The change in determinants of stock market integration due to crisis indicates that global investors are flexible as they are able to adapt to dynamic environment.

Keywords: Emerging Markets, Asia Pacific, Stock Market Comovement.

Introduction

Stock market comovement is a matter of interest for policymakers, financial institutions, and portfolio managers. For policymakers, it entails increased vulnerability to financial crisis happening at any part of the world. For financial institutions, strong stock market comovement opens avenues to acquire foreign funds at lower costs. For portfolio managers, it implies reduced international portfolio diversification benefits. Given the importance of stock market integration for different fraternities, it is imperative to analyze evolution and determinants of stock market integration.

The literature on stock market comovement can be divided into two strands. First, studies have focused on analyzing thelong run relationship between various equity markets. For instance, Arshanapalli and Doukas (1993) find that equity markets of UK, Germany, and France are cointegrated with that of USA. Gerrits and Yuce (1999) report influence of USA on equity markets of UK, Germany, and Netherlands. Taylor and Tonks (1989), Corhay et al. (1993) and Mylonidis and Kollias (2010) find that cointegration relationship exists among major stock markets of

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Europe. According to Batareddy et al. (2012), Asian markets share cointegration relationship with the USA. The empirical results of Darrat and Zhong (2002) indicate that Japan has long run influence on Asian markets. The second strand of literature focuses on the factors that foster long run relationship between stock markets. Erb et al. (1994) find that business cycle influences correlation between stock market returns of G7 countries. Morana (2008) shows that financial integration and economic integration play an important role in influencing comovement between stock market returns of G7 countries. According to Bracker et al. (1999) bilateral import dependence, geographic distance between markets, market size differential, and time trend are the key macroeconomic factors that influence same day relationships between developed markets of UK, USA, Canada, Japan, Australia, Hong Kong, Singapore, Switzerland and Germany during 1972 to 1993. Chen and Zhang (1997) find that countries with strong economic relationships tend to have well-integrated stock markets. Wälti (2011) reveals that monetary integration strengthens stock market integration.

There is voluminous work on stock market integration in developed markets. However, researchers have not worked in emerging markets in much detail. Global investors and portfolio managers are showing increasing interest in emerging markets because of its better risk adjusted returns, good economic growth prospects and improving financial system. This calls for empirical analysis regarding integration of emerging markets with its developed counterparts as strong equity market interdependence will reduce long term international diversification benefits. Further, after the 1930s Great Depression, the 2008-2009 Global Financial Crisis (GFC) is considered as world's worst economic downturn. Equity markets across the world reeled under its adverse impact. According to Sushil (2012) firms must always look for innovative strategies in chaotic business environment. As GFC instilled chaos and uncertainty in financial systems across the world, it is important to analyze the impact of GFC not only on the degree of comovement between different equity markets but also on the factors that foster such comovement. Such an analysis will reflect if European financial system were flexible in responding to the dynamics injected by such a grave crisis.

This study addresses the above issues and examines how GFC influenced stock market integration between developed and emerging markets in Europe. It also assesses if the determinants of stock market comovement have changed post global financial crisis.Rest of the paper is organized as follows. Section 2 details the data and methodology. Section 3 presents the empirical results. Section 4 discusses the results and provides concluding observations.

Data and Methodology

Table 1enlists the developed and emerging markets of Europe that are included in the study. The time period of this study is from January 2000 till 31 December 2015.

Table 1: List of equity markets and respective stock indices under study

Country	Index
Europe: Developed Markets	
United Kingdom	FTSE 100
France	CAC 40
Germany	DAX 30
Switzerland	SMI
Europe: Emerging Markets	
Czech Republic	Prague SE PX
Greece	Athex Composite
Hungary	BUX
Russia	MICEX

This study adopts atwo-stage framework. In the first stage, we understand the how stock market integration between developed and emerging markets in Europe has evolved over time using realized correlation. In the second step, we use pooled regression to identify the factors that drive stock market integration in this region. Details of these two steps are given below.

Step 1: Realized Correlation

Realized correlation is estimated by using daily stock returns. Daily stock returns are the log difference of daily stock price index. The stock price indices used in the study are expressed in local currency.

Let r_{itd} and r_{jtd} be thedaily return of market i and market j at day d in year t respectively. Annual realized variance of market i ($\sigma_{t,i}^2$) is computed by using sum of squared returns observed during the period.

$$\sigma_{t,i}^2 = \sum_{d=1}^{D_t} r_{itd}^2 \quad (1)$$

whereD_t is the number of trading days in year t. The number of years in this study is 16 (2000 till 2015). Realized variance of market j ($\sigma_{t,j}^2$)can be estimated in the same manner. Realized covariance between annual stock returns of market i and market j is computed using the following approach.

$$\sigma_{ij,t} = \sum_{d=1}^{D_t} (r_{itd} \, x r_{jtd}) \quad (2)$$

Realized variance and Realized covariance is used to compute realized correlation in the following manner

$$\rho_{ij,t} = \frac{\sigma_{ij,t}}{\sigma_{t,i}^2 x \sigma_{t,j}^2} \quad (3)$$

The estimated realized correlations are Fisher transformed so that the values range from -"till".

$$\overline{\rho_{ij,t}} = \ln\left(\frac{1+\rho_{ij,t}}{1-\rho_{ij,t}}\right) \quad (4)$$

In depth discussion on realized correlation can be found in Lee and Cho (2017).

Step 2: Pooled Regression

Pooled regression is used to identify the determinants of stock market comovement. Realized correlation is used as the dependent variable. We propose that stock market comovement can be explained by variables that proxy for economic integration and financial sector development.

To capture economic integration,macroeconomic variables like bilateral trade relationship, GDP growth rate differential and inflation rate differential are used. Paramati et al. (2016) argue that strong bilateral trade relationship encourages business cycle synchronization which in turn strengthens stock market integration. Mobarek et al. (2016) find that economies at similar levels of GDP growth rate tend to have strong stock market comovement. Pretorius (2002) maintains that economies that are homogenous in terms of inflation rates will display ahigh degree of stock market comovement. Financial sector development implies thedevelopment of equity market.

Variables like volatility ratio, stock turnover ratio differential and market capitalization to GDP ratio differential are used to capture stock market development. Time trend is also introduced in the regression model.

The above-mentioned factors are used as explanatory variables in the pooled regression model. The regression model is given below:

$$RC_{i*j,t} = \alpha + \beta_1 t + \beta_2 ECO_{ij,t} + \beta_3 FD_{ij,t} + \varepsilon_{ij,t} \quad (5)$$

where the dependent variable is realized correlationbetween markets i and j at time t, á is constant, $ECO_{ij,t}$ is the vector of variables that proxy for economic integration and $FD_{ij,t}$ is the vector of variables that capture financial sector development. To capture the impact of the global financial crisis on determinants of stock market integration, samples are divided into pre-crisis period (2000-2007) and post crisis period (2008-2015). The regression analysis as explained in equation 6 is performed on both these sub-periods.

Results

Realized Correlation

The results of realized correlation will indicate that the three phases of crisis transmission as recognized by Chiang et al. (2007) can be observed here as well. Contagion phase is the first phase in which there is a steep rise in correlations among crisis-hit markets. In the second phase of herding period, correlations are maintained at high levels asany bulletin from one market is considered as the news from the entire region. In the last phase of post crisis period, correlations fall back to pre-crisis levels. A visual examination of the data shows that the years 2008-2009, 2010-2013 and 2014-2015 can be categorized as contagion, herding, and post-crisis phase respectively. The average values of realized correlation between developed and emerging markets of Europefor each of these phases including pre-crisis phase (2000-2007) presented in Table 2. The results of Table 2 confirm the impact of the global financial crisis of stock market comovement in both the regions.

Table 2: Average Values of Realized Correlation between developed and emerging markets of Europe

Phases	Europe
Pre Crisis	0.56
Contagion	0.91
Herding	0.72
Post Crisis	0.51

Pooled Regression

Pooled regression is used to identify the determinants that drive stock market integration between developed and emerging markets in Europe. Regression results are presented in Table 3. As discussed earlier regression is performed on pre crisis and post crisis periods.

Table 3: Pooled Regression Results

Determinants	Europe	
	Pre-Crisis	Post Crisis
Trend	0.06***	-0.02***
Trade	-0.30	0.96
GDP	0.002	0.05
Inflation	0.07*	0.09
Volatility	-0.12	0.27
Stock Turnover Ratio	-0.02	-0.15**
Market Capitalization	-0.02	0.12
Intercept	0.51	2.45**
F Test	2.20**	2.52**
R^2	0.12	0.23

***,** and * indicate statistical significant at 1%, 5% and 10% respectively

The R^2 of the pre-crisis period is lower than that of post crisis period. This implies that the contribution of statistically significant determinants increased post the financial crisis. Trend and inflation are the two factors that are found to be statistically significant in the pre-crisis period. Past studies have shown that globalization and growth of information technology have improved stock market comovements. This might be the probable explanation of the positive impact of trend on stock market integration in Europe. Pretorious (2002) suggests that economies at the same level of inflation will have similar levels of discount rates. This will lead to homogeneous valuations as a result of which respective stock indices will converge. Hence as inflation rate differential between two markets reduce, their stock market comovement increases.

The determinants have changed in the post crisis period. The results surprising show the negative impact of the trend on stock market integration. This result probably reflects the fragility of markets after the financial crisis. Also, in the post crisis period inflation rate differential no longer plays a significant role. In fact, stock turnover ratio differential, which is a proxy for liquidity becomes a statistically significant factor for stock market integration in Europe. This finding indicates that the post the crisis investors became very conscious and were primarily concerned about the ease of exit from an equity market while making investment decisions.

Concluding Observation

This study investigates the impact of the global financial crisis on evolution and determinants of stock market comovement between developed and emerging markets of Europe. For this purpose, realized correlation is used to understand how stock market comovement between this market pair has evolved over the last 16 years. Pooled regression is employed to assess the impact of the global financial crisis on the determinants of stock market integration.

The results of realized correlation indicate strengthening of stock market comovement during the global financial crisis. This confirms the concept of contagion which is documented by the literature. Contagion implies that during the crisis, economic shock in one country rapidly gets transmitted to other parts of the world.

The regression results reveal that during the pre-crisis period (2000-2007), stock market comovement in Europe was primarily influenced by economic factors like inflation rate differential. However, global financial crisis altered the situation. Post crisis liquidity of stock returns became the significant determinants of stock market integration. The findings reveal that post global financial crisis, global investors paid more importance to the ease of exit from the equity markets of the European region.The change in determinants of stock market integration due to financial crisis reflect that global investors are flexible as they are able to react effectively to changing circumstances (Piore, 1998) and are able to adapt to dynamic internal and external environment (Sushil, 2001).

Findings of this study have important implications for global investors and policy makers. Investors can use the findings in designing a portfolio which provides better risk adjusted returns. Policy makers can use the findings of this study to formulate suitable economic stabilization and resource-mobilizing policies.

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Foreign Exchange Risk Management by Companies: A Systematic Literature Review

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Abstract

This paper studies a broad range of research and highlights the main findings of the literature regarding the foreign exchange or currency risk management by different companies. More specifically the study finds various ways in which a company manages this exposure and observes the most popular method for the same. The paper also reviews and discusses important aspects of forex risk management that a company should scrutinize for formulating an effective strategy. Further, the paper brings out the practices and methods followed by companies to manage the foreign exchange exposure with the focus on the structural and the strategic change that has come in the company practices over the years for the currency risk management. The paper concludes by laying out the future direction for research in this area.

Keywords: Foreign Exchange, Companies, Risk Management, Strategy.

Introduction

Internationalization of the companies, integration of the financial markets, themobility of people, goods and services across borders, in short globalization, has exposed companies to numerous risks.Foreign exchange risk is one of the most prominent risk where the movement in the currency exchange rate impacts the financial performance and the value of the company (Choi and Prasad 1994, Chow & Chen 1998, Bradley & Moles 2001, Kiymaz 2003, El-Masry et al. 2007, Bartram 2008, Wei and Starks 2013).It,thereforebecome extremely important for the companies to manage this risk.There are various ways in which the companies manage this exposure. Some companies formulate a centralized strategy for the forex risk management where the risk is managed for all subsidiaries and sister companies from a centralized unit(Stanley & Block 1980, Collier & Davis 1985).Few companies use operational hedges like using foreign debt, geographic diversification of business, operations in multiple currencies, etc. to manage the currency risk. (Chowdhry & Howe 1999, Allayannis & Ofek 2001, Hagelin & Pramborg 2004), few companies use financial hedges like currency derivatives to manage this exposure (Duangploy 1997, Chowdhry & Howe 1999, Marshall 2000, Kim et al. 2006, Fornés & Cardoza 2009) while some integrate both operational and financial hedging strategies to manage the currency risk (Kim et al. 2006, Bartram & Bodnar 2007, Faseruk and Mishra 2008, Chong et al. 2014).

Broadly foreign exchange exposure is classified as transaction, translation and economic exposure. Transaction exposure is the cash flow variability faced by the companies because of time delay

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in the entry and settlement of the contract. This risk rises with the rise in the time delay of the settlement of the transaction.Translation risk is the balance sheet risk which arises when a multinational company consolidates its financial statements and value all the assets and liabilities of the subsidiaries in its home currency. Economic exposure measures the impact of the exchange rate variability on the future cash flows of the company, and it is relatively difficult to measure this exposure.Majority of the firms manage the transaction and translation exposure (Collier et al. 1992, Marshall 2000, Aabo 2001, Nguyen & Faff 2003, Clark & Judge 2009, Chong et al. 2014).

The literature is filled with various research papers that study the foreign exchange risk management by companies. Such papers are varied, and each paper studies a different aspect of this topic.Further, the foreign exchangerisk management is an important aspect of business operations which is gaining considerable importance over the years. With this background, there are two motivations behind this research. First, with the availability of such vast literature on the topic,there is a need to bring a thoroughness to the literature review which serves as a means for making sense out of the findings of the collection of the studies. This paper is one of the first such attempts for the topic under study. Second, with the development and integration of the foreign exchange markets the world over, the risk of exchange rate fluctuations has increasedeven for the companies which do not have foreign operations. The regulatory bodies are also taking notice of this change and coming up with various policies to make the management of foreign exchange risk easier for the companies.The present study,therefore, undertakes an extensive systematic review of the available literature to understand what the collection of the studies are saying.

Method and Research Scope

The systematic research is carried out as per the basic guidelineslaid down by the Tranfield, Deyner, and Smart (2003) for carrying out such a review in the field of management. They laid down three stages for carrying out such a review:

Stage I: Planning the review

Stage II: Conducting the review

Stage III: Reporting and Dissemination

The stage I includes identifying the need for review and preparing a proposal followed by developing a review protocol. The section one (01) of the present paper fulfills the criteria for identifying the need for review and proposal preparation. Stage II involves identifying research, selecting studies, assessing quality, extracting data and synthesis. Stage III is reporting and recommendation (Tranfield et al. 2003).

Developing Protocol

Identifying Research Papers

To identify the relevant research papers under the mentioned topic, a broad search of relevant keywords was undertakenon six social science database Emerald, Elsevier, Jstor, Springer, SSRN and Wiley Online Library. Since theacademic database is often constraint by the keyword used, journals included,etc.; relevant searches were also conducted on Google Scholar to identify pertinent research papers.

For primary inclusion,the title, keyword or abstract of an article had to contain a combination of four groups of keywords. The first group addressed"foreign exposure management"which was

fulfilled using the phrases: “currency risk”and “foreign exposure management” and “FX exposure management”. The second group addressed “companies” which was fulfilled using the phrases: “non-financial companies” and “firms” and “corporates” and “organizations”. The third group addressed “strategies” for managing this exposure as adopted by the companies which was fulfilled using phrases “operational hedging strategies” and”financial hedging strategies” and “determinants of FX/ forex/ currency exposure management”. The fourth group addressed “Regulation of forex risk management” which was fulfilled using phrases: “Guidelines for forex risk management” and “Accounting for forex risk management”.

Inclusion Criteria

It includes a set of rules that an article must meet tobe included in the analysis. Thus, all the papers that were identified through the keyword search were included in the analysis only if they met the following criteria:

1. Journal Quality Threshold: The papers were taken from peer-reviewed journals which guarantee minimum quality if relevant studies.
2. English language: Full text of the article must be present in an electronic format and should be in the English language which adds to the replicability and transparency of the review.
3. Scanning for fit: The articles were scanned for their fit with the specific topic of theliterature review. First, the articles were screened by the title, then by abstract and finally each research paper was read, and a thorough examination of the article was done from the perspective of the theme of the study.

   During this stage, thefull text of the article was read and analyzed, and finally,73 articles were selected for the study.
4. Reference papers: References of all the selected papers were scanned to identify further relevant articles, and finally, the number was increased to 75

   The table I shows the details of articles found from different database.

Table I: Selection of Studies

Source	Selected Studies
Emerald	20
Elsevier	22
Google Scholar	2
JStor	8
Springer	3
SSRN	2
Wiley	16
from Reference	2

Exclusion Criteria

Books, Ph.D. Thesis, technical reports, working papers and articles published in conference proceedings were excluded to maintain the quality of the systematic literature review. Further

articles which focused on general hedging in themarket, currency investment portfolios, derivative usage in financial market and studied risk in general or combined foreign exchange risk with other risk were also excluded.

Review Findings

As a first step, the articles were classified into various categories like context, region, study type, objective, topics approached and results and implications. Table II shows the sorting of each research paper into different categories.

Table II: Classification Index

S.No.	Categories	Sub-Categories
1	Context	A - Developing Economies B - Developed Economies C - Not Applicable
2	Region	A - USA & Canada B – Europe C – Asia D - Emerging Markets E - Australia and New Zealand F - Other Countries G - Not Applicable
3	Study Type	A – Descriptive B – Empirical C – Survey D – Other
4	Objective	A - FX risk faced by companies / industry B - Determinants of FX risk C - Effect of exchange rate movements on cashflow, stock return and value of firm D - FX risk management strategies E - Hedging or using of derivatives for FX risk management F - Effectiveness of foreign exchange exposure hedging G - Financial model and foreign exchange risk management H - Accounting for the FX exposure hedging I - The forex market and exposure management
5	Topics Approached	A - Foreign exchange rate exposure of the firm/industry B - Management of different types of foreign exchange expos ure C - Foreign exchange exposure management linked to firm-specific characteristics D - Foreign exchange exposure and value of firm E - Foreign exchange risk management strategies - Operational and Financial F - Use of Financial instruments for foreign exchange risk management G - Hedging the foreign exchange risk and effectiveness of hedging H - Regulatory Guidelines for derivatives hedging I - Financial Models for foreign exchange risk management J - Foreign exchange market and exposure management K - Speculation and foreign exchange risk management
6	Results and Implications	A - Consistent with previous literature B - Existing model different data C - Guidelines for implementation D - Enhances the literature

Classification Index of Articles

There are six major categories numbered one (01) to six (06). These categories are further sub-categorized and coded by letters (as shown in Table II). Each paper is classified in these categories and each paper was assigned different codes depending on the scope of thepaper.

The first category is 'Context'which is an important category which helps us in determining the places where such studies are most conducted.The further sub-categories are coded as A, B, C where A represents DevelopingEconomies, B represents Developed Economies and C is Not Applicable.Next, the articles are further categorized as per the 'Region' where the articles are further categorizedas per the geographic region where the study is undertaken. Thisenables us to identify the countries of research. The further classificationunder this category are coded from A to G where A represents USA & Canada, B represents Europe, C represents Asia, D represents Emerging Markets, E represents Australia and New Zealand, F represents Other Countries, and G represents Not Applicable.

Next, the articles are classified as per the 'Study Type'.This category classifies papers as per the type of study undertaken. Here the sub-categories are coded from A to D, where A representsdescriptive study, B representsempirical study, C representssurvey methodfor the study andD representsothermethod of research. 'Objective' is the next category where the articles are classifiedon the basis of the expanded objective of each research paper. Further, to understand the broad topics of discussion of the articles, the main topics are identified and are classified and coded from A to K under the main heading 'Topics Approached'.Finally, results and implications of each articleare classified incategory 'Results and Implications'.

Classification of Articles

Each articleis organized in the above-mentioned categories. Table III provides the detailed classification of each paper in all the categories described above.

Table III: Classification of Articles

S.No.	Year of Study	Context	Region	Study Type	Objective	Topics Approached	Results and Implication	Cite Score
1	1980	B	A	C	A, D, G	A, E, F	C, D	7
2	1983	C	G	A	A, E	A, F, G	A, C, D	176
3	1985	B	B	C	A, B	A, B, C, E	B, D	50
4	1990	B	A	B	A	A, B, C	A, B, D	120
5	1990	B	A	B	A, C	A, C, D	B, C, D	1495
6	1992	B	A, B	D	A, D	A, B, E	A, B, D	10
7	1993	A, B	A, B, C	B	A	A	B	841
8	1994	B	A	B	C	D	B, D	920
9	1994	B	E	B	A, C	A, D	B, D	174
10	1995	B	A	B	B, C	A, C, D	B, D	472
11	1997	B	A	C	A, D, H	A, B, E, I	A, C, D	11
12	1997	C	G	A	A	A, B	A, D	21
13	1997	B	A	B	A, B, C	A, B, E, F, G	A, D	231

14	1997	B	G	A, B, C	E	F, G	B, D	1395
15	1998	B	C	B	B, C, E	A, C, D, F	A, B, D	128
16	1998	B	C	B	C	A, C	B, D	679
17	1998	B	A	B	A	A, B, C	A, B, D	204
18	1999	C	G	B	D, E	E, F	A, B, D	146
19	1999	B	A	B	A, D	A, C, D, F	A, B, D	59
20	2000	B	G	A	H	H	C, D	9
21	2000	C	G	B	G	F, G, I	B, D	55
22	2000	A	C, D	B	A, B, I	A, C, D, J	A, B, D	26
23	2000	A, B	A, B, C	C	A, B	A, B, E, F	A, B, D	135
24	2000	B	B	C	A, B	E, F, G, J	A, D	31
25	2001	B	A	B	D, E	D, E F, G	B, C, D	313
26	2001	B	A	B	D, E, F	E, F, G	A, B, D	1011
27	2001	B	A	B	D, E, F	D, E, F	A, B, D	1057
28	2001	B	B	C	A	B, C, D, E	A, C, D	30
29	2001	B	B	B	D	E	B, D	120
30	2001	B	B	A, B, C	D	B, C, E	A, B, D	16
31	2001	B	A, C	B	C, D	A, C, D	A, B, D	342
32	2001	B	A	B	D	A, E	A, B, D	249
33	2001	B	A	B	D, E, F	E, F, G	C, D	341
34	2002	B	G	A	H	H	C, D	1
35	2002	B	A, B	C	A	A, E	A, D	16
36	2002	B	A	B	C	A, D	A, D	17
37	2002	B	A	B	C	A, D	A, D	48
38	2003	B	A	B	G	I	A, B, D	313
39	2003	B	A	B	A, C	A, C, D	A, B, D	46
40	2003	B	C	B	C	A, C, D	A, B, D	79
41	2003	B	B	A, B, C	E	B, D, F	A, B, D	133
42	2003	A	C, D	B	A	A, D	B, D	126
43	2003	B	E	B	E	B, E, F, G	A, B, D	94
44	2004	B	B	B	A	A, B, C, E, F	A, C, D	163
45	2004	B	B	A, B, C	E, F	B, D, E	A, B, D	141
46	2005	A, B	A, B, C	B, C	B	C, D, E	A, D	41
47	2005	B	C	B	C	A, C	A, B, D	17
48	2005	B	A	D	C	E, F	A, D	34
49	2005	C	G	A	A, D, E	B, D, E F	A, D	50
50	2006	B	B	B	B, C	B	A, B, C	43
51	2006	B	B	B	D	C, E	A, B, D	42
52	2006	A	C, D	B	A, B	A, C, E	A, B, D	10

53	2006	B	B	B	B, C, D	A, C, E, F	A, B, D	76
54	2006	B	A	B, C	C, D	B, E, F	A, B, D	167
55	2006	C	G	B	A, C, D	A, C, D, E	A, B, D	182
56	2006	B	B	B	C, D, E	A, D, E, F	A, B, D	35
57	2006	B	B	B	A	A, C, D, E	A, B, D	43
58	2006	B	A	B	A	A, C, D	A, B, D	74
59	2007	B	B	B	B, C	C,E, F, G	A,B	43
60	2007	B	A	B, C	A	A, E	A, D, D	143
61	2007	B	B	B	B, C	A, C	A, B	26
62	2007	B	A	B	A	A, C, D, E	A, B, D	25
63	2008	B	A	B	C	E, G	A, D	12
64	2008	C	G	B	A, D	E, F	A, B, D	113
65	2009	A	C, D	A, C	B, C	B, C, D, E	A, D	7
66	2009	A	F, D	A, B, C	C, D, E	C, E, G, I	A, D	23
67	2009	B	B	B	D, E	B, E, F, G, H	A, B, C, D	65
68	2010	B	G	B	A, C, D	A, C, D, H	B, C, D	54
69	2011	A	C, D	B	E	C, E, F, G	B, D	22
70	2012	B	B	B, C	D	E, F, K	A, D	10
71	2013	B	A	B	A, B	A, C, D	A, D	19
72	2013	B	B	B	B, F, H	F, G, H	A, D	19
73	2013	B	B	B	B	A, C, D, F	A, D	18
74	2014	A	C, D	A, B, C	E	C, E, F, G,	A, C, D	10

Most of the studies about 76 percent focused on the developed countries. Very few about 9 percent only focused on only developing economies.This shows that foreign exchange risk management by the companies has been exhaustively studied in the developed markets whereas there is a lot of scope to study the forex risk management by companies in developing economies. Further, it was only after the year 2000 that the research started focusing on the emerging economies.Out of the studies that met the inclusion criteria of the paper, more than 60 percent of the studies focused on US, Canada, and Europe area. Only 13 percent of the studies focused exclusively on Asia and out of these only nine percent researched emerging markets. There is clearly a gap in the studies conducted.

Majority of the studies, approximately 67 percent, used empirical method for their research where majorly the researchers used regression analysis. Approximately 15 percent of the studies used the combination of either two or three different statistical methods.

The objective of each of the articles is broken into nine simpler categories.Majority of the studies primarily focused on foreign exchange risk as faced by companies, identifying determinants of this risk, measuring the effects of exchange rates on different financial parameters like cash flows, stock return and overall value of the firm, studying the management strategies for containing this risk and evaluating hedging or use of derivatives for FX risk management.Very few studies, approximately six percent, evaluate the effectiveness of hedging the risk, and only three percent study the financial models or accounting requirement for forex risk management. It is surprising to note that only one article studies the forex market.

The main topics in the articles are also analyzed, and important subjects approached in each article is identified. Major subjects which majority of these articles discuss are different types foreign exchange rate exposure faced by the firm, impact of foreign exchange fluctuation on firm-specific characteristics, impact of these fluctuations on the value of the firm, operational strategies for management of forex exposure, financial strategies, that is, use of financial instruments for hedging the risk. Approximately 50 percent of the articles discuss the strategies for managing the forex risk and 40 percent talk about theimportance and use of financial instruments for hedging the risk, but only 21 percent discuss the effectiveness of hedges undertaken. Moreover, important subjects like regulatory guidelines for hedging, use of financial models for evaluating risk management and study of the foreign exchange market are not given due importance and are hardly discussed in these articles.

Almost all the studies are consistent with the existing literature and provide guidelines for implementation and enhance the literature. The empirical studies, use the already existing models for data analysis.

Main findings of the articles

Table IV presents the cluster of findings of the articles under study.

Table IV: Cluster Findings of Articles

Cluster of Findings	Sub-Clusters	Main Findings
Reasons for Managing Foreign Exchange Risk	Relevance of the currency risk management for companies/ industry	Market imperfections like incomplete securities market, positive transaction and information cost, agency cost, etc. make it necessary for the companies to manage the forex risk (Dufey&Srinivasulu 1983). The impact of exchange rate movement on industry return is larger for internationally oriented economies (Bodnar & Gentry 1993). Japanese firms are adversely affected by yen depreciation (Chow & Chen 1998). Textile, machinery, chemical and financial industries on Turkeyare highly exposed to foreign exchange fluctuations(Kiymaz 2003). Firms in open economies have significant exchange rate risk (Jong et al. 2006). Higher number of UK firmsare exposed to changes in theforeign exchange rate (El-Masry 2006). US firms with foreign operations are affected by the exchange rate movements (Muller & Verschoor 2006). More firms are exposed to exchange rate changes (Doidge et al. 2006).
		The operating cash flows are of key relevance to the firms, and these are significantly impacted by the exchange rate movements (Bartram 2008). As the time horizonis increased and the data across firmare pooled then factors like size, leverage, growth opportunity and liquidity make it relevant for the firms to manage the forex exposure (Agyei-Ampomah 2013).
		Cross-listed Canadian firms on American exchange are more sensitive towards exchange rate changes (Booth & Rotenberg 1990). The stock returns are affected by the exchange rate movement however the stock prices do not fully reflect the changes in the currency on a timely basis because of thecomplex relationship between currency price and firm value (Bartov& Bodnar 1994). The sensitivity of stock returns to the exchange rate movements is small (Khoo 1994).

	Stock returns are affected by the foreign exchange exposure	There is a significant relationship between changes in dollar value and stock price performance (Shin &Soenen 1999). The lagged exchange rate return affect the stock return of the firm (Chiao& Hung 2000). The link between stock return and changes in the yen exchange rate is negatively related to foreign operations of the firm (Doukas et al. 2003). Stock prices are affected by the movement of the currency rates (Dewenter et al. 2005). Stock returns of proprietary drugs are affected by the exchange rate changes while the stock return of the generic drugs is not affected by the exchange rate (Chan et al. 2002). The volatility of the commonstock of the firm increases with the increase in the variability of the exchange rate(Chen & So 2002). Contemptuous and lagged changes in the exchange rate are significant in explaining stock return which could be positive or negative (Choi & Kim 2003). There is a significant relationship between stock return and yen fluctuations, andthe investors can access this impact of exchange rate on firm value without any delay (Doukas et al. 2003). There is stronger evidence of thepresence of association between company's stock return and exchange rate changes(El-Masry 2006). US stock return is asymmetrically affected by the exchange rate movements (Muller & Verschoor 2006). UK firms stock returns are more affected by foreign exchange exposure (El-Masryet al. 2007). The stock prices of financially distressed firms are more sensitive to exchange rate movements (Wei & Starks 2013). There is aweak association between stock return and forex exposure (Agyei-Ampomah 2013).
	Foreign sales, foreign assets, and income	The firm with large foreign sales, assets and operating profits are more sensitive to the exchange rate changes (Choi and Prasad 1994). A firm with larger proportion of foreign assets and revenue are more sensitive to exchange rate changes (Booth & Rotenberg 1990). The forex exposure is positively and reliably correlated with thedegree of foreign involvement (Jorion 1990). Exchange rate movement affects firm's sales volume, profit margins and input cost(Bradley & Moles 2001). Domestic competition from foreign firms and foreign sales are major determinants to exchange rate exposure (Williamson 2001). Firms with higher degree of export and import experience a greater foreign exchange exposure (Kiymaz 2003). The ratio of foreign sales to total sales is an important explanatory variable for the foreign exchange rate exposure (Bartram 2004). The impact of foreign exchange exposure on the profit margin for collusive firm is more than competing firms (Dekle 2005). Firms with large international sales outperform those with international sales during periods of currency depreciation and underperform during periods of currency appreciation (Doidge et al. 2006). Firm size and foreign sales ratio are significantly and positively related to the exchange rate exposure (Jong et al. 2006). The exchange rate exposure coefficient is positive for the firms with foreign sales (El-Masry& Abdel-Salam 2007). Financially distressed firms find it difficult to smooth out the foreign exchange fluctuations which are detrimental to managing the forex exposure (Wei & Starks 2013).

	Impact on the firm value	Exchange rate risk impacts the value of the firm even if they do not have material foreign assets, revenue or debt (Booth & Rotenberg 1990). The value of the US multinationalss significantly correlated with the changes in the dollar value (Shin &Soenen 1999). The industrial companies focus on the cash flow rather than market value to determine the exchange rate exposure (Aabo 2001). There is a relationship between exchange rate fluctuation and the value of the firm (Chen & So 2002). The changes in the exchange rate have asignificant impact on the value of the US firm with Asia operations (Choi & Kim 2003). Companies face both linear and non-linear components of the foreign exchange exposure,and this non linearity originates from corporate cash flows (Bartram 2004). Different objectives of the forex risk management have adifferent impact on the value of the firm (Faff & Marshall 2005). The exchange rate movements do affect firm value (Choi and Prasad 1994, Doidge et al. 2006, El-Masryet al. 2007, Forné s& Cardoza 2009).
Characteristics of Firms and Management of Foreign Exchange Risk	Structure, policies and exchange rate exposure of the firm	Centralized risk management policy is followed by themajority of firms (Stanley & Block 1980). There is a centralized control for currency risk management in UK MNC's. Further, firms which experienced high forex risk followrisk-averse policies whereas firms which experienced low risk managed only a part of it (Collier & Davis 1985). Firms with high leverage, low liquidity, and high cash dividends are more exposed to forex exposures (Chow and Chen 1998). Japanese firms with weak short-term liquidity position or firm with high financial leverage have more incentive to hedge and therefore have lower exposure to exchange rate exposure (He & Ng 1998). The management of forex risk depends upon the structured setting of thecompanies , and there is no specific time horizon for its management(Aabo 2001). The foreign exchange rate exposure is- time varying for multinational firms which changes withthe structure of the industry and industry competition changes through time (Williamson 2001). Companies are risk averse, but currency risk management policies are not clearly formulated in the goals of the firm (Belk 2002). Practically less number of firms show significant exchange rate exposure than the theory predicts (Bartram & Bodnar 2007). Firms with higher default probabilities, greater growth opportunities, and more unique products face higher exchange rate risk (Wei & Starks 2013).
	Significance of firm size and growth	Large firms are positively exposed to exchange rate changes (Chow et al. 1997). The magnitude of forex exposure is significantly related to the size of the firm but is weakly related to the ratio of foreign sales to total sales (Belk &Edelshain 1997). For small return horizon smaller firms have small exposure and for longer return horizon larger firms have large exposure (Chow and Chen 1998). Smaller Japanese firms have lower exchange rate exposure (He & Ng 1998). Export to sales ratio and firm size are important determinants of exchange rate exposure (Chiao& Hung 2000). Firm's with greaterbread th(diversification) have less exposure as compared with firms with greater depth (Pantzalis et al. 2001). Foreign exchange exposure of the firm increased with the size of the firm (Hagelin & Pramborg 2004).

		Firm size asymmetries are of greater importance when determining thelink between stock return and currency movements (Muller & Verschoor 2006). Large firms gain relative to small firms during currency depreciation even after controlling for foreign involvement (El-Masryet al. 2007). Size of the firm, frequency of imports has no relationship with the foreign exchange risk management (Sirpal 2009).
	Experience, skills, knowledge, and ability of the managers	In case of large exchange rate exposure, the responsibility of managing it falls on finance director, in other cases, the treasurer manages this exposure (Collier & Davis 1985). UK firms with high transaction risk adopted close out strategy whereas US firms allowed treasurers discretion within the agreed limits to manage currency flows (Collier et al. 1992). The effectiveness of the forex risk management can be improved if the managers better understand the nature of the exposure and its impact on the organization which will enablethen to adopt better techniques for managing forex exposure (Belk &Edelshain 1997). UK firms take along-term strategic view of the effects of currency fluctuations (Bradley & Moles 2001). There is lack of knowledge of the impact of FX risk on firm value as the firms do not know therisk profile of their cash flows (Faff & Marshall 2005). Managers incentive, knowledge on currency hedging is also an important determinant of conducting hedging activity (Hu & Wang 2006).
	International operations and multiple currency exposures	Export to sales ratio and firm size are important determinants of exchange rate exposure (Chiao & Hung 2000). Geographical dispersion of the company does not reduce exchange rate exposure, and such companies are more likely to use financial hedges to protect themselves from the exchange rate risk (Allayannis et al. 2001). The exposure effect of yen on thestock return is higher for multinationals and high-exporting firms(Doukas et al. 2003). The Asian financial crisis heightened the interest of US management on the issue of company's exposure to Asia. Therefore, the exchange rate coefficient should be estimated as a function of international operations(Choi & Kim 2003). The extent of internationalization is significantly positive in explaining the magnitude of FX exposure (Faff & Marshall 2005). Firms with along-term commitment to the foreign markets and whose future cash inflows are primarily based on already established business activity regard foreign debt as important (Aabo 2006). The proportion of significant foreign exchange exposure is higher for the firms which generate a higher percentage of revenue from abroad (El-Masry& Abdel-Salam 2007). There is a positive relationship between the exchange exposure of firm and openness of trade as the firms in more open economies are exposed to greater indirect exposure which is difficult to manage as it requires firm-wide strategic approach (Hutson & Stevenson 2010).
		Translation risk is managed by three-fourths of the UK firms (Collier & Davis 1985). Majority of the firms in UK and US followed a consistent pattern of policy to manage transaction and translation exposure (Collier et al. 1992). The central idea of foreign exchange risk management is the day to day management of transaction exposure. Along with it, the firms also manage translation and economic exposure by making cash flow forecast (Duangploy et al. 1997).

Currency Risk Management Strategy	Types of foreign exchange exposure	Economic exposure impacts the profits of the firms more than transaction and translation exposure and by managing this economic exposure the tomorrow's transaction and translation exposure can be much reduced.Only large firms attempt to manage the economic exposure as it is costly to manage and requires matching of foreign currency inflows and outflows (Belk &Edelshain 1997). The current strategic and financial hedging practices of US firms do not eliminate economic exposure to forex movement for many firms. Further, FDI provides greater opportunity to hedge the economic exposure of the firm (Miller &Reuer 1998). MNCs in the USAplace more importance on transaction risk than translation risk. However, larger MNCs place more importance on translation risk which could be explained by their large overseas operations. Popular internal method for managing translation risk is balance sheet hedging method and popular internal method for managing transaction risk ismatching, and netting and external method is forwards (Marshall 2000). Majority of the firms are concerned with managing their transaction exposure. Some firms are also actively managing their accounting exposure too. It is interesting to note that although academic favors management of economic exposure but only a few firms manage it in practice (Glaum 2000). There are some complexities in classifying economic exposure , and therefore,more sophisticated evaluation techniques are required to identify firms with economic exposure (Bradley & Moles 2001). Industrial companies consider transaction exposure to be the most important exposure to be managed while very little importance is assigned to translation exposure (Aabo 2001). The firms should take the structure of economic exposure into account for estimating the exposure (Bartram 2004). Companies do not focus on the economic exchange rate risk. It is important for the firms to focus on this exposure especially when the world has become globalized. Companies should consider long-term forward-looking perspective, should focus on cash flows, take into account the effects of exchange rate changes on price and quantity, consider theoperative flexibility of the firm and focus on the currencies of denomination and determination (Bartram et al. 2005).
	Operational strategies for managing the currency risk	Differentiation strategies of the companiesdo not help in controlling the effects of exchange rate fluctuation (Miller &Reuer 1998). Corporations will use operational hedging strategy only when they face both exchange rate and demand uncertainty(Chowdhry& Howe 1999). Firms also use foreign debt to protect themselves from exchange rate movements, and foreign sales is an important factor in determining the use of foreign debt (Allayannis & Ofek 2001). Firm's ability to construct operational hedges lead to lower forex exposure for the MNC (Pantzalis et al. 2001). Companies in which export constitute a significant proportion of the net sales are more likely to raise foreign currency debt. Large firms with a wider access to financial markets are more likely to raise debt than small firms (Keloharju &Niskanen 2001). Larger firms have lower exposure due to their ability to use operational hedging strategies (Hagelin & Pramborg 2004). Debt dominated in the foreign currency is an important alternative to the use of currency derivative for managing the forex exposure. This importanceis further linked to geographical expansion, thevalue of thefirm and on assets to debt ratio (Aabo 2006).

		Use of derivative has no significant effect on the management of exchange rate exposure, and the exposure is significantly reduced by using operational strategies or on balance sheet hedging methods like foreign loans and operations (Jong et al. 2006). Operational hedging strategies can be effective in managing short-term exposure. Many global firms use limited financial derivatives despite higher levels of currency risk exposure (Kim et al. 2006).
	Financial strategies for managing the currency risk	Forwards are the most commonly used derivatives for forex risk management (Stanley & Block 1980). The most popular derivatives for the risk management are forwards followed by options (Duangploy 1997). Most firms successfully hedge the effects of short-term exchange rate changes using forward contracts (Belk &Edelshain 1997). Firms which deal in commodity use financial instruments to contain the forex risk. Mostly the firms use the financial hedges to manage short-term exposure (Chowdhry& Howe 1999). Asian Pacific MNCs were more likely to use a larger number of external instruments and - the exchange traded instruments(Marshall 2000). How a firm hedges its exposure depends upon foreign exchange volatility, exposure volatility, technical factors and recent hedging outcomes (Brown 2001). Using foreign currency derivatives for theshorter duration like a weekora month captures the transaction exposure which is effectively hedged (Nguyen & Faff 2003). The non-linear foreign exchange exposure suggests the use of financial hedges instruments to manage the forex exposure (Bartram 2004). Financial hedging can be effective for hedging short-term exposure which is transaction exposure (Kim et al. 2006). Firms use one or more hedging instruments to manage forex exposure. Mostly larger firms hedge the currency risk (Davies et a. 2006). Independent multinational firms have tighter financial constraints and are more likely to hedge the exposure (He & Ng 1998). Multinationals use hedging their exposure, resulting in insignificant exposure of total cash flows(Bartram 2008). Methods such as cash in advance, open account, documentary collections, irrevocableL/C etc. are used to a greater extent by firms involved in foreign exchange transactions. Methods like foreign currency overdrafts, leading and lagging, currency forwards, futures and options are used to lesser extent (Sirpal 2009). The Latin American companies mainly used financial hedging instruments for managing the exchange rate exposure (Forn s& Cardoza 2009). The use of foreign debt is not a preferred strategy for highly levered firms. These firms use swaps to create synthetic liabilities. Overall the result shows that it is important to use swaps for hedging the currency risk and improving the firm value (Clark & Judge 2009). UK non-financial firms use derivatives to manage forex risk which is effective in reducing this exposure (Zhou & Wang 2013). The financial hedging strategyis the complementary strategy which helps in reducing the exchange rate risk which the firms face. Company's assertive level, market risk, regulation, knowledge, and skill of the firm all determine the execution of financial hedging (Chong et al. 2014).

	Interaction of Operational and Financial strategies	The overall result suggests that the firm use currency derivative and foreign debt as ahedge against forex fluctuation. The firms use of operational hedges in conjunction with the financial hedges improves the value of the firm (Allayannis&Ofek 2001). Financial and operational hedging effectively reduce the effect of exchange rate changes on stock prices (Dewenter et al. 2005). Financial as well as operational hedging can cope with the foreign exchange rate exposure (Bartram et al. 2005). The financial and operating hedging strategies are complementary and help in reducing the risk exposure. MNCs adopt these to manage their overall forex risk (Kim et al. 2006). Firms use both operational and financial hedging strategy where matching/netting and currency forward contracts are the most popular tools of forex risk management. However, external tools are more popularly used than internal tools (Davies et al. 2006). The non-financial firm can employ both financial and operational forex risk management strategy (Bartram & Bodnar 2007). There is aninteraction between operational and financial strategies of the firm which is reflected in the firm's exchange rate exposure quotient (El-Masryet al. 2007). The use of operational hedging strategies in conjunction with the financial hedging strategy is value enhancing for Canadian firms (Faseruk and Mishra 2008). The Latin American companies, from experience and learning, adopted models based on active participation of different functional areas in the companies to manage the exchange rate risk. Thus, a cross-functional approach is adopted to manage the exchange rate risk (Fornés& Cardoza 2009).
	Financial Models and firm exposure	Capturing the time-varying means and variances of the exchange rate series in the financial models lead to better risk and return characteristics of the hedging strategies. Additionally,no one model is uniformly superior for all criteria. Therefore, it is important to choose the level of risk behavior and the class criterion functions in combination with a specific model than to endlessly fight on the specific functional forms of the time series models for exchange rate return (Bos et al. 2000). Standard one month horizon is not necessarily optimal for estimating exposure, and longer horizons are preferable. Further, the choice of themarket portfolio in the exposure model has a strong impact on the resulting estimates of the firm level exchange rate exposure (Bodnar & Wong 2003). Exchange rate exposure and its determinants are sensitive to estimation methods (Agyei-Ampomah 2013).
Hedging the Foreign Exchange Risk	Reasons for hedging with derivatives	Firms with high growth opportunities but low accessibility to internal and external financing are most likely to use currency derivatives to reduce cash flow variations (Géczy et al. 1997). Hedging is more common in large firms than small firms (Shin &Soenen 1999). Most of the firms hedge their foreign exchange risk, but only a few firms fully hedge their exposure and majority of firms hedge only part of their exposure (Glaum 2000). Firms that use currency derivative has ahigher value than firms which do not use currency derivatives (Allayannis& Weston 2001). Informational asymmetries, facilitation of internal contracting and competitive pricing are the primary motivation for hedging (Brown 2001). Firm's exposure through foreign sales and trade is a very important factor that prompts and guides their decision to hedge (Allayannis&Ofek 2001). Firms use currency derivativesto hedge transacting exposure to increase the value of the firm. Translation exposure, however, is not hedged using derivatives (Hagelin 2003).

		Firms with higher growth opportunities, higher leverage and lower liquidityhave more incentive to hedge the exchange rate exposure (El-Masryet al. 2007). Canadian firms with higher level of US sales tend to use derivatives more often for forex risk management, but firm with both US sales and assets do not use derivatives as often (Faseruk and Mishra 2008). It is important to distinguish between the derivative instrument that is appropriate for hedging short-term transaction exposure like forwards and options and those that are appropriate for hedging long-term multiple periods foreign currency exposure like swaps (Clark & Judge 2009). Forex derivatives are used to enhance the shareholder's wealth by reducing the firm's forex exposure. Firms having larger outsider's holdings are more likely to make hedging decisions in the best interest of the shareholders (Afza and Alam 2011).
	Effectiveness of hedging	Hedging effectiveness is positively related to the hedging effort (Belk &Edelshain 1997). Australian firms are effective in hedging short-term exposure they have limited success in hedging long term exposure (Nguyen & Faff 2003). There isrisk -reducing effect from transaction exposure hedges and translation exposure hedging which implies that the hedging is effective (Hagelin&Pramborg 2004).
Foreign Exchange Market and Risk Management	Growth of foreign exchange market	The three market liberalization events in Taiwan significantly affected the exchange rate exposure of the firms (Chiao& Hung 2000). Given the low trading volume of the derivatives in Malaysia, the market players need to be educated in the use of derivatives for minimizing risk (Chong et al. 2014).
	Efficiency of the foreign exchange market	Most of the financial managers do not accept that the random walk hypothesis is applicable on the foreign exchange market (Stanley & Block 1980). Firms widely use exchange rate forecast and base their risk management strategies on these forecasts which is an indication that they do not believe in the efficient market hypothesis and are able to beat the market with their own forecast. The academics, however, states that it is very difficult to make systematically successful exchange rate forecast (Glaum 2000). Currency rate changes are not all equally predictable, and thus currency risk measures should be adjusted for predictability to conform to the definition of currency exchange rate risk (Fiedor&Hoła 2016).
	Forex speculation and risk management	Firms on average hedge and not speculate in the market (Géczy et al. 1997). Firms use derivatives to hedge rather than speculate in the market (Allayannis&Ofek 2001). Foreign exchange speculation is widesp read in the Danish firms with foreign operations. This active speculation is positively related to the size and international involvement of the firm. The speculation also increases with the involvement of non finance department in forex risk management (Aabo et al. 2012).
		The distinction between domestic and foreign operations is not always clear because of issues like transfer pricing and cost allocation, and therefore, FASB has left wide scope for managers for this interpretation. This resulted in different definition of foreign sales which further create measurement errors (Jorion 1990). FASB lacks standards on accounting for innovative financial instruments used for the managing the forex risk (Duangploy 1997).

Regulations for Management of Foreign Exchange Risk	Accounting for exposure	SFAS 133 (accounting standard issued in June 1998 by FASB) on accounting and reporting standards for thederivative financial instrument is an improvement over the previous standards (Duangploy&Helmi 2000). FASB requires that all derivatives be reported on thebalance sheet as an asset or liability and measured at their fair value. Accounting differs depending on the classification of derivative as a fair value hedge or cash flow hedge. Companies should be aware of this requirement (Wilson &Heitger 2002). If the new accounting rule IAS 39 unduly influences the use of derivatives or encourage firms to move away from the derivatives and use other operational hedging methods like foreign currency debt, then this could have negative consequences for the shareholder value (Clark & Judge 2009). The FRS 13 guidelines implemented in the UK mandates the numeric disclosure of derivative use by firms which is helpful in revealing important information to investors (Zhou & Wang 2013).

Reasons for Managing Foreign Exchange Risk

The foremost finding in most papers is theidentification of reasons for managing the foreign exchange risk. This finding is sub-clustered in four categories as per various reasons highlighted by different studies.

Relevance of the currency risk management for companies or industry

Dufey&Srinivasulu 1983 stated that market imperfections make it necessary for the companies to manage the forex risk. Further, firms in open economies are highly exposed to the forex riskand are, therefore, adversely affected by the exchange rate movements (Bodnar & Gentry 1993, Chow & Chen 1998, Kiymaz 2003, Doidge et al. 2006, Jong et al. 2006, El-Masry 2006, Muller & Verschoor 2006). The currency risk management is relevant for the companies to manage because the fluctuations in the foreign exchange market impact the operating cash flows (Bartram 2008). Moreover, as the time horizon increases factors like size, leverage, growth opportunity, and liquidity make it more pertinent for the firms to manage this exposure (Agyei-Ampomah 2013).

Stock returns are affected by the foreign exchange exposure

Many studies equate the management of foreign exchange risk with the impact the exchange rate fluctuations have on the stock return for the company. If the stock return for the company is impacted by the fluctuations, then there is a need for risk management. Majority of the studies found that the stock returns are impacted by the exchange rate fluctuations (Booth & Rotenberg 1990, Bartov & Bodnar 1994, Shin & Soenen 1999, Chiao & Hung 2000, Dewenter et al. 2005, Chan et al. 2002, Chen & So 2002, Choi & Kim 2003, Doukas et al. 2003, El-Masry 2006, Muller & Verschoor 2006, El-Masry et al 2007, Wei & Starks 2013). Only two studies found aweak association between stock return and forex rate fluctuation (Khoo 1994, Agyei-Ampomah 2013).

Foreign sales, foreign assets, and income

The exchange rate fluctuations should have more impact for the companies which have large foreign sales, more foreign assets, more income from abroad and ahigher degree of export and import. Studies which support this reason are Choi and Prasad 1994, Booth & Rotenberg 1990, Jorion 1990, Williamson 2001, Kiymaz 2003, Bartram 2004, Doidge et al. 2006, Jong et al. 2006, El-Masry& Abdel-Salam 2007. Exchange rate fluctuations have a direct impact on the firm's sales volume and profit margin (Bradley & Moles 2001).

Impact on the firm value

There is a direct impact of the exchange rate changes on the value of the firm (Booth & Rotenberg 1990, Choi and Prasad 1994, Shin & Soenen 1999, Chen & So 2002, Choi & Kim 2003, Faff & Marshall 2005, Doidge et al. 2006, El-Masry et al 2007, Fornés & Cardoza 2009)

Two important determinants of the management of foreign exchange exposure are cash flows and value of the firms. Aabo in his study in 2001 stated that the industrial companies focus on the cash flow rather than market value to determine the exchange rate exposure.Bartram 2004 also mentioned that non-linearity in the foreign exchange exposure originated from the corporate cash flows.

Characteristics of Firms and Management of Foreign Exchange Risk

The management of the foreign exchange risk is also related to the characteristics of the companies. This cluster is divided intofour sub-clusters, presented below.

Structure, policies and exchange rate exposure of the firm

The companies have centralized control for risk management (Stanley & Block 1980, Collier & Davis 1985). Additionally, firms with low forex risk manage only a part of the forex risk (Collier & Davis 1985).Later studies mentioned that the structure of the company and the industry determines the management of the exchange rate exposure (Aabo 2001, Williamson 2001). Belk 2002 mentioned that although the companies are risk averse, they do not formulate the currency risk management policies in their goals which implies that this exposure is not given sufficient importance or maybe because practically less number of firms show significant exchange rate exposure than the theory predicts (Bartram & Bodnar 2007).Firms with high leverage and low liquidity have more incentive to hedge (Chow and Chen 1998 and He & Ng 1998).

Significance of firm size and growth

The foreign exchange rate exposure is higher for large companies and smaller for small companies (Chow et al. 1997, Belk &Edelshain 1997, Chow and Chen 1998, He & Ng 1998, Chiao& Hung 2000, Hagelin&Pramborg 2004, Muller & Verschoor 2006 and El-Masryet al. 2007). Only one study, Sirpal 2009 has found that size of the firms is not related to the exchange rate risk. Further, more diversified firms have less forex exposure (Pantzalis et al. 2001).

Experience, skills, knowledge, and ability of the managers

The forex risk is managed by treasurers of the companies, but in case of large exposure, finance director manages it (Collier & Davis 1985).While comparing companies in UK and US, UK firms adopted close out risk management strategy whereas US firms allow limited treasurer's discretion to manage the exposure (Collier et al. 1992).Additionally, UK firms take along-term strategic view of the currency exposure (Bradley & Moles 2001). If managers better understand the nature of the exposure and its impact on the organization, then the effectiveness of the risk management can be improved (Belk & Edelshain 1997) but managers lack this knowledge (Faff & Marshall 2005). Further, hedging of risk is also dependent upon managers incentive and knowledge on currency hedging (Hu & Wang 2006).

International operations and multiple currency exposures

Multinational firms are present in multiple countries. The geographical dispersion of the company increases its exposure to the foreign exchange risk (Chiao & Hung 2000, Allayanniset al. 2001, Doukas et al. 2003, Choi & Kim 2003, Faff & Marshall 2005, Aabo 2006, El-Masry& Abdel-Salam 2007, Hutson & Stevenson 2010). Moreover, such companies are more likely to use financial hedges to protect themselves from the exchange rate risk (Allayanniset al. 2001).

Foreign Exchange Risk Management Strategy

The next findings are related to the forex risk management strategies. There are three kinds of foreign exchange exposures - transaction, translation and economic which is managed by operational and financial strategies. This cluster is divided into five sub-clusters.

Types of foreign exchange exposure

Foreign exchange risk encompasses three kinds of exposure – transaction, translation and economic. Transaction risk arises because of time delay in the execution and conclusion of a transaction. Translation risk is the accounting or balance sheet exposure which arises when the financial statements of the company are compiledtogether, and economic risk measures the impact of exchange rate fluctuation on the future cash flows of the firm. Out of these three exposures, transaction risk is most actively managed.Companies also focus on and manage translation risk but do not take any measure to manage economic exposure (Collier & Davis 1985, Collier et al. 1992, Marshall 2000, Glaum 2000, Aabo 2001 and Bartram et al. 2005). Economic exposure is ignored because there are some complexities in managing this exposure (Bradley & Moles 2001) but firms should take the structure of this exposure into account for formulating risk management strategy (Bartram 2004). The importance of economic exposure has increased with globalization. This exposure has more impact on profit than transaction and translation exposure, and it is important for the firms to manage it for long-term growth. Since it is costly to manage economic exposure, few large firms do manage it. Further, FDI would provide greater opportunity to hedge the economic exposure (Belk &Edelshain 1997, Miller &Reuer 1998 and Bartram et al. 2005).

Operational strategies for managing the currency risk

Operational strategies are also called internal strategies where the company manage its operations to control the forex exposure. Companies might lead or lag a payment, diversify its operations and operate in multiple currencies to enable netting of exposureor deal in home currency only, etc. Companies might also use foreign debt to protect themselves from exchange rate movement (Allayannis & Ofek 2001, Keloharju & Niskanen 2001, Aabo 2006).Large firms use operational hedges which lead to lower forex exposure (Pantzalis et al. 2001, Hagelin & Pramborg 2004, Jong et al. 2006). This strategy is also usedwhen companies face demand uncertainty (Chowdhry & Howe 1999). Companies that use operational hedging strategies limit the use of financial derivatives (Kim et al. 2006). One study also argued that differentiation strategies do not help in controlling the exchange rate exposure (Miller &Reuer 1998).

Financial strategies for managing the currency risk

Financial strategies are popular methods of hedging the nonlinear exchange rate exposure of the company which involves the use of forex derivatives (Marshall 2000, Bartram 2004,Bartram 2008,Fornés& Cardoza 2009,Zhou & Wang 2013). The most commonly used derivative is forward. The financial hedges help the company in managing short-term exposure which is transactionexposure mostly (Stanley & Block 1980, Duangploy 1997, Belk & Edelshain 1997, Chowdhry & Howe 1999, Nguyen & Faff 2003, Kim et al. 2006). Large, independent and highly levered multinational firms use derivatives to hedge the forex exposure (He & Ng 1998, Davies et a. 2006, Clark & Judge 2009). There are various factors which determine the use of financial hedging like company's assertive level, market risk, regulation, knowledge, and skill of the firm (Chong et al. 2014).

Interaction of Operational and Financial hedging strategies

Both operational and financial hedging strategies are complementary strategies and firm use both together to manage their exposure(Allayannis & Ofek 2001, Dewenter et al. 2005, Bartram et al. 2005, Kim et al. 2006, Davies et al. 2006, Bartram & Bodnar 2007, El-Masry et al 2007, Faseruk and Mishra 2008). The use of both the strategies together is value enhancing for the companies (Allayannis&Ofek 2001, Faseruk and Mishra 2008). Latin American firms adopt a cross-functional approach to manage the exchange rate risk (Fornés& Cardoza 2009)

Financial Models and firm exposure

It is important to adopt financial models for effective management of forex risk. The exchange rate exposure is sensitive to the choice of estimation methods (Agyei-Ampomah 2013). Moreover, taking the time-varying means and variances of the exchange rate series in the financial models lead to betterhedging strategies. It should also be noted that there is no one model that is uniformly superior for all criteria (Bos et al. 2000).

Hedging the Foreign Exchange Risk

Companies use currency derivatives because they have high leverage, low liquidity and less accessibility to internal and external financing, to take advantage of informational asymmetries, to contain the exposure of foreignsales and trade (Géczy et al. 1997, Brown 2001, Allayannis & Ofek 2001, El-Masry et al. 2007, Faseruk and Mishra 2008). Studies also show that firms which hedge using derivatives have higher values than firms which do not use derivatives (Allayannis& Weston 2001, Hagelin 2003, Afza and Alam 2011). Forwards and options are used for short-term hedging,and currency swaps are used for long-term hedging (Clark & Judge 2009).

Effectiveness of hedging

Once the hedges are undertaken, it is important to determine the effectiveness of thehedge. This effectiveness is positively related to the hedging effort (Belk &Edelshain 1997). Hedging becomes effective if it reduces the forex risk of the company (Hagelin&Pramborg 2004).Nguyen & Faff (2003) studied the Australian companies and concluded that these companies effectively manage short-term exposures.

Foreign Exchange Market and Risk Management

The next most important section studied by the articles is the forex market. This section is sub-clustered into three categories

Growth of foreign exchange market

The articles focusing on the emerging economies studied the growth of forex market in these countries. Chiao& Hung (2000) concluded that liberalization of Taiwan significantly impacted the exchange rate exposure of the firms. Chong et al. (2014) studied the Malaysian market and concluded that the market players shouldbe educatedto derivatives for minimizing risk.

Efficiency of the foreign exchange market

The efficiency of the market is related to the concept of informational efficiency where the prices reflect the true information available in the market. Random walk hypothesis is consistent with the efficiency of the market. Most of the managers use exchange rate forecast to formulate hedging strategy which indicates that they do not believe in the efficient market hypothesis (Stanley & Block 1980, Glaum 2000). Studies also argue that the exchange rates are not equally predictable and therefore, the exchange rate measures should be adjusted for predictability for formulating hedging strategy (Fiedor&Ho³da 2016).

Forex speculation and risk management

Hedging and speculation are two different activities. Hedging is undertaken to cover the risk associated with the forex exposure whereas the objective of speculation is to take advantage of disequilibrium in the market and earn profits. Firms operate in the market with the objective of managing the risk and not of earning profits. Thus, they hedge and not speculate (Géczy et al. 1997, Allayannis&Ofek 2001). However, the speculation is positively related to the size and internationalization of the company (Aabo et al. 2012).

Regulations for Management of Foreign Exchange Risk

Regulations pertaining to the management of foreign exchange risk are the guidelines for the companiessupervising them to account for the exposure in their books. This is an important information which the companies should reveal for the sake of the stakeholders in their organization. Two significant international accounting regulatory bodies are FASB (Financial Accounting Standard Board), based in the United States and IASB (International Accounting Standard Board), based in London, United Kingdom.

Accounting for exposure

The accounting guidelines for forex exposure management were unclear initially as FASB had left wide scope for managers for interpretation of various issues to clearly distinguish between domestic and foreign operations (Jorion 1990). Further, FASB lacked standards on accounting for innovative financial instruments used for the managing the forex risk (Duangploy 1997).SFAS 133 (accounting standard issued in June 1998 by FASB) on accounting and reporting standards for derivative financial instrument were an improvement over the previous standards (Duangploy & Helmi 2000) where it required that all derivatives should be reported on balance sheet as an asset or liability and should be measured at their fair value (Wilson & Heitger 2002). The accounting standards issued by IASB, IAS 39 in 2003, alsolacked important considerations. It unduly influenced the use of derivatives and encouraged firms to move away from the derivatives and use other operational hedging methods like foreign currency debt which could result in negative consequences for the shareholder value (Clark & Judge 2009). Further, FRS 13 guidelines which were implemented in the UK mandated the numeric disclosure of derivative used by firms which helped in revealing important information to investors (Zhou & Wang 2013). However, this standard has been withdrawnfor reporting periods starting on or after 1 January 2015.

Discussion

Foreign exchange risk is an important segment in the overall risk faced by the companies. With the internationalization of the operations of the company, globalization of markets and open and unrestricted movement of people and resources across geographies, the impact of foreign exchange fluctuations on company's profits and value is increasing. Majority of the studies included in this systematic review focused on developed nations. The attention of researchers shifted towards developing economies after the year 2000. This could be because most of these economies were closed economies till the 1990's. A major shift in their structure came with the reforms of liberalization and globalization which majority of developing countries (India, Brazil, Mexico and South Korea) adopted in the 1990s. This liberalization was followed by the growth and development of these economies, and they were now termed as the emerging economies. Major emerging economies today comprise of India, China, Brazil, Russia, Mexico, South Africa, Malaysia amongst others. With the growth of these nations, development of the industry and internationalization of companies, the impact of fluctuating forex rate was also felt by the companies operating in the emerging markets. Since there are very limited studies

which focus on the forex risk management by companies in emerging markets, the future researchers should conduct more meaningful and substantial studies on these economies.

The foreign exchange risk is relevant for the companies to manage because it impacts the stock return and value of the company. This foreign exchange risk is higher for the companies with higher international exposure. This implies that although dealing in multiple currencies and diversification of operations across geographies might help in netting the overall exposure, but it more likely might lead to increase in the exposure to foreign exchange fluctuations. The foreign exchange exposure of the firm is impacted by the size of the company, its structure, and policies for managing it. Managers knowledge, skill, and abilityare also crucially important for the risk management. Further, abetter understanding of the manager about the nature of exposure, its impact on the company value, the forex market of the country and the regulations, etc. would lead to better and efficient risk management strategies.

There are two kinds of strategies which a company can employ. These can be classified as operational strategies and financial strategies. Operational strategies are internal to the firm which comprise of the use of foreign debt in the capital structure, settlement of transactions in the home currency, inter-company netting of receipts, etc. Other strategy is called the financial strategy as it deals with the use of currency derivatives to hedge the exchange rate risk. The studies show that both the strategies are complementary to each other and using them together would increase the value of the firm. Once the strategy has been implemented, it is necessary to check for the effectiveness of the same. Generally, firms carry out the effectiveness of the implemented financial or hedging strategy. Out of all the articles studied, only three articles study the effectiveness of the hedging strategy. There are two reasons for this. First, there is no unique or standard definition of theeffectiveness of hedge because of which classification of aneffective hedging strategy for a firm is difficult. Second, calculating the effectiveness is not a standard practice as it is not a mandatory requirement for the firms. But this has changed now. The new accounting standards IFRS 9, which are accepted by themajority of the nations, provide a separate section on measurement and reporting of hedge effectiveness. The second gap is thus, to explore, research and develop models for evaluating hedge effectiveness. The future research can focus on calculating theeffectiveness of the hedges undertaken by the companies.

Foreign exchange risk management is a holistic concept which involves the study of the forex market, thestudy of the structure and operations of the company and internationalization and multi-currency dealings of the company, etc. The risk management strategy cannot be formed in isolation, and all these parameters must be considered. Out of the articles which are discussed in the paper, only a handful talk about the foreign exchange market. This is the third gap, and the future researchers can focus on studying the structure and inter-relationships of the foreign exchange market necessary for formulating an effective strategy. Structure of the companies has also undergone tremendous change over the years. These changes in the structure are a reflection of changes in the external environment, be it market changes, internationalization of the operations, regulatory changes, etc. The studies under consideration pay very less importance to the organizational structure which provides a scope for thefourthgap where future research can focus on the evolution of the structure of company for foreign exchange risk management.

Conclusion

The present study highlights four research gaps. First, future research should focus on the foreign exchange risk management strategiesof the companies in emerging economies. Second, hedging effectiveness should be given due importance, and future studies should focus on evaluating theeffectiveness of hedging. Third, it is important to understand the foreign exchange

marketbefore forming any risk management strategies. Therefore, the future research should examine the nature and inter-relationships between forex market. Fourth, future research should exploreand evaluate the changes in the organizational structure that has come over the years for the management of foreign exchange risk.

Like any other study, the present study also suffers from few limitations. First, the findings of the study are limited to the research articles under study which is again limited by the inclusion and exclusion criteria. Further, our selection process strictly focused on journal articles and excluded other types of literature like books, Ph.D. Thesis, technical reports, working papers and articles published in conference proceedings which are collectively called as grey literature. Although inclusion of these could have enriched our results butthese controls were necessary to implementto maintain the quality of the study and reliability of the results. The review was confined to the journal articles because these are the usual means of communicating novel scientific findings.

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Gold as a Hedge Against Purchasing Power Risk

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Abstract

India and China are the world's top two consumers of gold while USA, Turkey and Germany are amongst next top three gold consumers. Gold is the most popular investment avenue because of its ability to provide liquidity. The average monthly price however has grown by 1588% over the whole period 1979-June 2017. In this paper, we intend to investigate gold as an investment to hedge against inflation risk or purchasing power risk. The sample period to study the relationship between gold and inflation is 2011-2017 (March). To analyse long run equilibrium between gold and inflation (CPI-consumer price index), Johansen's cointegration approach has been used. The short and long run causality between gold and inflation has been studied using VECM and Wald test. The results of cointegration indicate that gold and CPI series are cointegrated and bear long run equilibrium. VECM and Wald test results indicate that there is only long run causality between CPI and gold prices. However, in short run these variables do not show any causality. Thus, we conclude that gold investment can be used as guard against purchasing power risk.

Keywords: Gold, Purchasing Power Risk, Cointegration, Inflation, Investment

Introduction

Inflation is a necessary ailment for investors and governments all over the globe. According to Fisher's effect, inflation rate is inversely related to real rate of interest on an investment. Higher the inflation rate, the lower will be the real rate of interest. In other words, higher inflation rate in an economy decreases the chances of getting high real return or interest rate on investment. The risk of getting lower real return than expected is called purchasing power risk or Inflation risk. Purchasing power risk corrodes the buying or purchasing power of money and the value of the real return on an investment. Thus, investors, portfolio managers and governments intend to manage and hedge against purchasing power risk. World Gold Council Report (2017) indicates that for a 1% increase in inflation, gold demand increases by 2.6%. This reflects that gold may be used as hedging tool against purchasing power risk.

Gold and Indian Culture have been sharing an age old association. It is used for various cultural reasons and as a store of value. Gold is the most popular investment avenue because of its ability to provide liquidity. In present digital era, we have another avenue like paper gold for making gold investment viz. exchange traded funds (ETFs), sovereign gold bonds, gold

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mutual funds and e-gold. Financial advisors across the globe are today relaying a lot on gold as an investment product. The major reason behind this is that the value of gold has been increasing and has reached an all-time high in the recent past.

India and China are the world's top two consumers of gold while USA, Turkey and Germany are amongst next top three gold consumers (World Gold Council Report 2015). India is second largest gold jewellery market in the world (World Gold Council Report 2017). Where about 20% of the total population is covered under health insurance, gold holdings play the role of insurance for the poor in India. Indian people buy gold more for gifts, personal use, status enhancement, or on the festivals like Dhanteras or Akshaya Tritiya, than during marriages (ICE 360º survey, 2016).

Gold has become universal phenomenon across consumers of all income levels. It is not only rich but also poor's choice for investment. That's the prime reason gold attracts only 3% GST (ICE 360º survey, 2016). India's middle class comprises of one of the world's largest population of an average 225 million people. This number is expected to reach 500 million's mark by the year 2025 as per NCAER estimates. World Gold Council Report (2017) indicates that income level is the prime deciding factor in gold consumption. It reports that 1% jump in income results in 1% increase in the gold demand. Also, for a 1% increase in inflation, gold demand increases by 2.6%. This shows that gold may be used as hedging tool against inflation. The purpose of this paper is to analytically investigate gold as an investment to hedge against inflation.

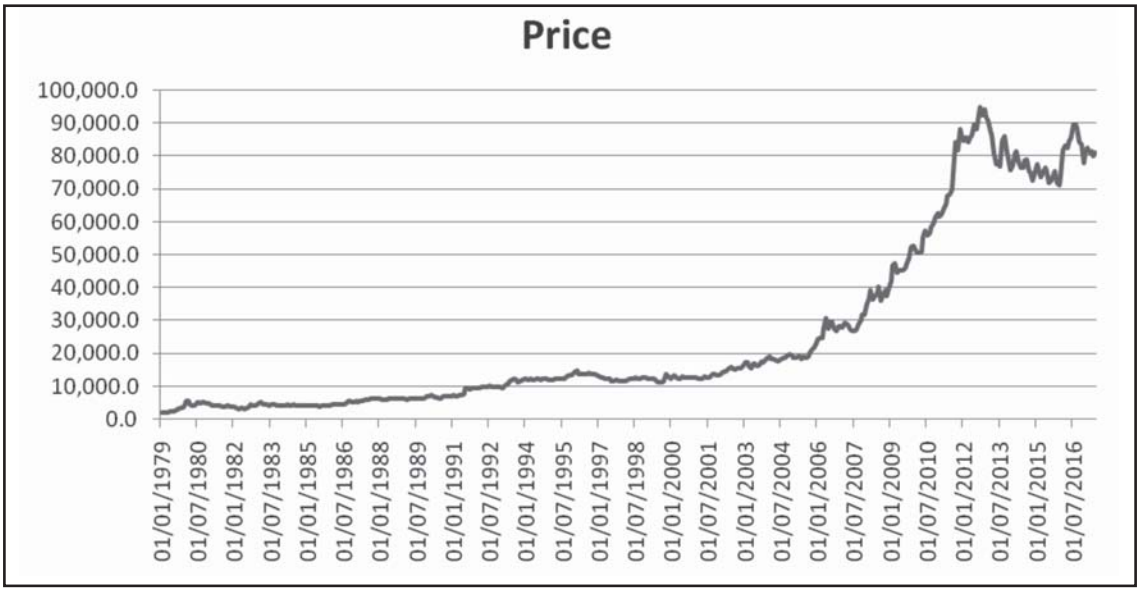


Figure 1: Gold Price Movement

Literature Review

There are a few studies on the relationship between gold and inflation. Some of the important studies have been mentioned here. Table 1 shows objectives, research methodology and major findings of these studies.

Table 1: Literature Review Summary

Year	Author 's	Objectives	Data & Research Methodology	Major Findings
2004	Ghosh et al.	Gold as an inflation hedge	Cointegration regression technique Sample period: 1976–1999	They results confirm theoretical model hypothesis that gold serves as an effective hedge against inflation.
2006	Worthington & Pahlavani	To analyse Cointegration relation with allowance for endogenous structural breaks	Cointegration analysis wi th endogenous structural breaks, Zivot and Andrews test.	They find a structural break in gold and inflation series in 1970s. Gold and inflation are strongly cointegrated.
2007	Nadeshda &Thomas	Gold in the investment portfolio	Risk and Return analysis using graphical analysis, correlation analysis Study period: 2000-2006.	They find a great increase in gold prices since 2000. They suggest that Deutsche Börse's Xetra-Gold minimizes the transaction costs. Moreover, it better than gold pool accounts as it is free of credit risk and better than gold futures as it does not have negative roll returns.
2011	Ivanov	The influence of ETFs on the price discovery of gold, silver and oil	Intra-daily data ETF and futures prices of Gold. ETF used in this study is the SPDR Gold Trust and iShares Silver Trust . Unit Root Test, Zero Mean Model JohansenCointe gration test Sample period March 01, 2009– August 31, 2009	They report that indeed there is a shift in the price discovery processes for gold and silver in that the ETF market dominates the information shares of both spot and futures markets while the oil market has price discovery occurring stillpredominantly in the futures market.

2012	Martin, Mulyadi and Anwar	Gold versus stock investment: Aneconometric analysis	probit econometric model sample period: 1997 to 2011.	Gold investment is better than stocks.
2012	Singhvi	Gold risk return analysis d uring recession	Descriptive Secondary data from BSE & NSE (1990 to 2009) Market Capitalization-Weighted	They find that gold has high risk but compensates that by high returns
2012	Mukul, Kumar & Ray	To compare Gold ETF Performance of Monthly Returns	Sample period: January 2010 to August 2011.	They infer that gold ETF has given better return than a diversified equity fund and investors should have a certain portion of their investment in gold.
2014	Jones & Sackley	To study the effect of economic policy uncertainty on gold prices.	Stepwise regression of multiple lags for each variable.	Results suggest that in addition to gold being a hedge against inflation, higher uncertainty in economic policy lead to Increase in gold prices.
2015	Hemevathy & Gurusamy	To analyze impact of demographic variables on the preference for different forms of gold for Indian working women	Primary data collected through a structured questionnaire Non-Parametric Pearson's chi square One way ANOVA.	They identify some important factor s like age, marital status, education, income, role in the Family. They conclude that women having higher disposable income generate more investment demand than consumption demand.
2015	Marwaha & Sangeeta	To study variables influencing preferences of individual investors for Gold (Safer Investment) Vis-A-Vis Stocks (Risky Investment)	Primary data collected through an interview, Weighted Average Scores method, Paired Sample T-test	Inflation Resistance is found as the most important variable and Stability of Income is found as the least influencing variable for investors towards investing in gold.

2011	Ibrahim& Baharom	To explore t he role of gold in financial investment in Malaysia.	Descriptive analysis, Baur and Lucey regression model and EGARCH model Sample period: August 2001 to March 2010	They find that gold investment results in diversification. Also, they report that there is a change in investment function of gold due to existing uncertainty in global financial market that has diminished gold' s role as a diversification asset.
2016	ICE 360º Survey	To study gold as an investment in India	Survey of 61000 households in India	The survey reports that 9 out of 10 rich, 8 out of 10 poor and 87% of the households hold gold.

Research Gap and Research Problem

From literature review, it has been observed that gold has been used as a hedging tool in many facets of investment. It is considered as a safe investment avenue because of its several benefits. It helps to hedge against inflation, political and currency risk (Aggarwal et al. 1992, Capie et al. 2005, Levin and Wright, 2006, Worthington and Pahlavani, 2006), hedge against stock returns (Baur and Lucey, 2010), hedge against economic policy uncertainty (Jones and Sackley, 2014), to diversify portfolio (Sherman, 1986 and Chua et al. 1990) and its forecast ability and other investment benefits (Smith, 2002 and Lucey et al. 2004). Gold's durability and worldwide acceptance further places it above other investment avenues.

The most imperative and common purpose of making investment in gold is to guard against inflation or purchasing power risk and to provide liquidity (Ghosh et al. 2004 and Worthington and Pahlavani, 2006). Despite of its well known benefits, there is a dearth of research on gold's effectiveness as a hedging tool against purchasing power risk in India - world's second largest gold consumer economy. To contain devastating impact of gold imports on trade balance, Government of India introduced the sovereign gold bond, gold monetisation scheme and gold coin in year 2015.This motivates us to study the relationship between gold and inflation, and further, investigate gold as a hedge against purchasing power risk.

Objectives of the study

This study intends to investigate gold as an investment to hedge against purchasing power risk by

i. analysing long run equilibrium between gold and inflation

ii. examining long run and short run causality between gold and inflation

Data and Research Methodology

Data

The sample period of this study is from 1979-2017 (June) for descriptive statistics analysis of gold returns. However, the sample period to study the relationship between gold and inflation is 2011-2017 (March). Due to non-availability of consumer price index (CPI) for April – June 2017,

we have restricted study up to March 2017. Monthly data on gold and CPI inflation is collected from the websites of World Gold Council and Reserve Bank of India (RBI) respectively.

Research Methodology

Unit Root Test

Augmented Dickey Fuller (ADF) test has been used to test unit roots. The select price series are expected to be non-stationary while their return series are expected to be stationary. The test has been conducted in all three form; constant, trend and intercept, and none. We test the null hypothesis of non-stationary of series. If the null hypothesis is rejected then the series is said to stationary otherwise it is non-stationary.

Johansen's Cointegration test

Short–run and long-run relationship study has been used to investigate gold investment as inflation hedge by a number of researchers (Moore, 1990; Laurent 1994; Chappell and Dowd, 1997; Mahdavi and Zhou, 1997).The most common approach to study long-run relationship found in literature is cointegration (Ghosh et al. 2004, Worthington and Pahlavani, 2006) and Johansen's cointegration test has been used widely in literature to study cointegration or long run equilibrium relationship between two non-stationary variables (Ivanov, 2011).Thus in this study we use Johansen's cointegration approach to test the long-run relationship between gold and inflation.

Two variables are said to be cointegrated if there combination is a stationary variable. For *Johansen's cointegration* test, a VAR model with k lags containing the given two variables is represented as follows:

$$\Delta Y_t = \mu + \Pi Y_{t-1} + \sum_{i=1}^{k-1} \Gamma_i \, \Delta Y_{t-1} + \varepsilon_t \qquad \ldots . \quad (3)$$

WhereYtis the vector to be tested for cointegration, λ_{trace} is trace statistics and λ_{max} is max eigen value statistics

Vector Error Correction Model (VECM) and Wald Test

Wetest the relationship between the two markets for causality and error correction using Vector Error Correction Model (VECM) shown in equation (4) and (5).

$$\Delta P_{c,t} = a_c + \alpha_c P_{c,t-1} + \beta_g P_{g,t-1} + \sum_{i=1}^{k} a_{c,i} \Delta P_{c,t-i} + \sum_{j=1}^{k} a_{g,j} \Delta P_{g,t-j} + \varepsilon_{c,t} \quad (4)$$

$$\Delta P_{g,t} = a_g + \alpha_g P_{g,t-1} + \beta_c P_{c,t-1} + \sum_{i=1}^{k} a_{g,i} \Delta P_{g,t-i} + \sum_{j=1}^{k} a_{c,j} \Delta P_{c,t-j} + \varepsilon_{g,t} \quad (5)$$

Where subscripts c and *g* refer to CPI and Gold futures markets respectively.The error correction term,$\alpha_m P_{m,t-1} + \beta_n P_{n,t-1}$ or $\alpha_n P_{n,t-1} + \beta_m P_{m,t-1}$ represents the speed of adjustment

towards long run equilibrium. Here, both long term and short term causality has been studied using VECM. If these αs and αs are significant then there is a long term causality between the two markets. However, the short run coefficients α_{ci}, α_{gi}, α_{cj} and α_{gj} measure short term causality. Further, short term causality has been analyzed by using Wald test.

Empirical Findings

Statistics Summary

In Table 2, we have shown descriptive statistics of monthly gold prices and returns from 1979-June 2017. The whole period has been divided into four sub-periods 1979-1988, 1989-98, 1999-2009 and 2009-June 2017. The average monthly return has fallen from 1.02% in 1979-1988 period to 0.65% increased in 2009-June 2017. Similarly the volatility has also decreased from 6.47% to 3.71 % over the same period. The returns throughout have been positively skewed and leptokurtic in nature. This shows that gold returns are not normally distributed. Jarquebera probability further shows that the gold returns distribution is non-normal. The average monthly price however has grown by 1588% over the whole period 1979-June 2017.

Table 2: Statistics Summary over 1979-2017*

	Prices (Rs/Troy ounce)				Returns			
Period → / Descriptives	1979-88	1989-98	1999-2008	2009-2017*	1979-88	1989-98	1999-2008	2009-2017*
Mean	4348.070	10422.43	20130.57	73394.29	1.024822	0.597741	0.992293	0.653390
Std. Dev.	1045.968	2543.533	8204.742	14058.62	6.470933	3.246531	4.156579	3.711205
Skewness	- 0.048366	- 0.528199	0.954828	- 0.731663	1.530180	1.621844	0.173844	0.601763
Kurtosis	2.864165	1.910771	2.773447	2.403908	10.15820	11.96570	4.210286	3.987050
J B Prob.	0.932841	0.003164	0.000097	0.004965	0.000000	0.000000	0.019621	0.004965

*till June 2017

Unit Root Test

Augmented Dickey Fuller (ADF) test results report that the logarithmic series of gold price and CPI are non-stationary at levels (see Table 3). However, their return series are found to be stationary. The null hypothesis of non- stationary is rejected for return series. So we can proceed to apply Johansen's cointegration test on log series of gold prices and CPI.

Table 3: ADF Test Results for Crude Oil Spot and Future Price Series on Levels

Price	Model Form	Critical Values @ 5%	Test Statistics	*p*-value
Ln (CPI)	Trend and Intercept	-3.470851	-1.806193	0.6920
	None	-1.945199	3.398708	0.9998
ln (Gold)	Trend and Intercept	-3.470032	-2.826142	0.1928
	None	-1.945139	0.783452	0.8803
Return on ln (CPI)	Trend and Intercept	-3.476275	-6.527908	0.0000*
	None	-1.945199	-3.666091	0.0004*
Return on ln (Gold)	Trend and Intercept	-3.470851	-7.370349	0.0000*
	None	-1.945199	-7.266281	0.0000*

*represents significant results

Table 4: Johansen Cointegration Test Results

Hypothesised No of CE(s)	Eigen Value	λ_{trace} Statistics	Prob. For Trace Test	λ_{max} Statistics	Prob for Max Eigen value Test
r=0 (None)	0.15454	15.55033 (15.4947)	0.0491	12.42295 (14.26460)	0.0958
r≤1 (at most 1)	0.04138	3.127383 (3.8414)	0.0770	3.127383 (3.84147)	0.0770

Note: The critical values have been shown in parentheses.

Johansen Cointegration Test

In Table 4, the trace test values indicate that the null hypothesis of r = 0 is rejected while null hypothesis r≤1 is accepted at 5% significance level. It means the results suggest that there is one cointegrating relationship between the two variables. However, the λ_{max} probability value suggests contradictory results. In this case, the null hypothesis of r = 0 cannot be rejected. In case of conflict between the results of trace and max eigen statistics, we should prefer trace statistics (Johansen and Juselius, 1990). Thus we can conclude that gold and CPI series are cointegrated and bear long run equilibrium. Similar results were reported by Worthington and Pahlavani (2006). It means gold investment can be used as guard against inflation risk.

Vector Error Correction Model (VECM) and Wald Test

In Table 5, we have shown parameter estimates of VECM and Wald Test results to test for long run and short run causality. VECM model given in equation (1) has been presented in a different form as equation (2). In equation (1), C(1) represents the speed of adjustment towards long run equilibrium. It should be negative in sign and significant. C(1) is found to be -0.066938 with p = 0.0015. So we can say that there is long run causality from CPI to gold. In Table 5, it has been shown separately for a, á and â. It is evident from the results that the error correction term in equation (1) is significant. All these coefficients namely a, á and â are significant. This indicates that CPI has influence on gold in the long run. In other words, there is long run causality running from CPI to gold. Further, short term causality has been analyzed by using Wald test. The null hypothesis $b_1 = b_2 = 0$of no short term causality from CPI to gold prices cannot be rejected. It shows that there is no short term causality running from CPI to gold prices. Thus we conclude that there is only long run causality between CPI and gold prices. However, in short run these variables don't show any causality. It further supports the findings of Johansen's Cointegration test that gold investment can be used as hedge against purchasing power risk. The similar results were reported by Ghosh et al. (2004).

$$\Delta LGP_t = a + \alpha LGP_{t-1} + \beta LCP_{t-1} + \sum_{i=1}^{k} a_i \Delta LGP_{t-i} + \sum_{j=1}^{k} b_j \Delta LCP_{t-j} + \varepsilon_t \quad (1)$$

D(LGP) = C(1)*(LCP(-1) + 2.009650822*LGP(-1) - 27.421843167) + C(2)*D(LCP(-1)) + C(3)*D(LCP(-2)) + C(4)*D(LGP(-1)) + C(5)*D(LGP(-2)) + C(6) (2)

Table 5: Parameter estimates of VECM of Gold Prices and Wald Test

Parameter	Coefficient	Prob.
A	1.83556*	0.0015
A	-0.13451*	0.0015
B	-0.06693*	0.0015
a_1	0.159396	0.1639
a_2	-0.107063	0.3468
b_1	0.087095	0.9145
b_2	0.215993	0.7784
Wald Test for Short Term Causality		
Null Hypothesis	Chi-square	Prob.
$b_1 = b_2 = 0$	0.172936	0.9172

**denote significance of parameters at 5% level of significance.*

Implications of the Study

The findings of this research have got direct implications for retail investors, portfolio managers, treasury and fund managers, government, commercial traders etc. In emerging economy like India, the retail investors may invest in gold through different options like bullions, gold ETFs, gold bonds etc that would help to hedge against purchasing power risk. Similarly, portfolio managers may include gold in their portfolio to guard against inflation and immune real returns of their portfolio.

Concluding Remarks

Purchasing power risk corrodes the buying or purchasing power of money and the value of the real return on an investment. Investors, portfolio managers and governments intend to manage and hedge against purchasing power risk. In this paper, we intend to investigate gold as an investment to hedge against inflation risk or purchasing power risk. Gold and Indian Culture have been sharing an age old association. It is used for various cultural reasons and as a store of value. Gold is the most popular investment avenue because of its ability to provide liquidity.

The sample period to study the relationship between gold and inflation is 2011-2017 (March). To analyse long run equilibrium between gold and inflation (CPI-consumer price index), Johansen's cointegration approach has been used. The short and long run causality between gold and inflation has been studied using VECM and Wald test. The results of cointegration indicate that gold and CPI series are cointegrated and bear long run equilibrium. VECM and Wald test results indicate that there is only long run causality between CPI and gold prices. However, in short run these variables don't show any causality. Thus, we conclude that gold investment can be used as guard against purchasing power risk. The findings of this research have got direct implications for retail investors, portfolio managers, treasury and fund managers, government, commercial traders etc.

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Market Efficiency, Global Financial Crisis and Price Risk Management - An Evidence from Indian Gold Futures

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Abstract

Price risk management is a fundamental but vital function of futures market. To effectively discharge this function, futures market has to be efficient. Thus, it is important to analyze efficiency of futures market. Over the globe, gold is one of most traded commodity. However, there are a few studies on gold futures market efficiency. Also, none of the studies in literature analyses price risk management role of gold futures in India with reference to global financial crisis of 2008-09. Thus, this study aims at investigating the gold futures role in managing price risk related to gold spot market before and after the crisis.The results of Johansen's Cointegration test indicate that the gold spot and futures markets are cointegrated in both the sub-periods. Granger causality test results show that there is bidirectional causality between spot and futures gold market. In signifies that gold futures play an important role in price discovery with some feedback from spot market in both sub-periods. However, the price discovery role of gold futures markets has strengthened after the crisis. Thus, we conclude that gold futures performs price risk management function at Multi Commodity Exchange, India.

Keywords: Risk Management, Efficiency, Price Discovery, Gold, Futures, Global Financial Crisis

Introduction

Since the introduction of commodity futures trading in India, there have been questions on the very basic functions of commodity futures viz. Are commodity futures markets performing price risk management function? Do these markets lead to price discovery? Are these markets informationally efficient? An efficient commodity futures market provides an estimate of future spot price of underlying commodity in the form futures price and hence helps in managing price risk associated with that commodity. Price risk management is a fundamental but vital function of futures market. To effectively discharge this function, futures market has to be efficient. There are numerous studies on commodity market efficiency.There are numerous studies on commodity futures market efficiency in both developed and emerging economies. The findings of these studies are conflicting in nature. Many studies like Arora and Sandhar (2017), Malhotra and Sharma (2016),Singh and Singh (2015), Gupta and Ravi (2013), Ali and Gupta (2011), Singh (2010), Lokare (2007), Bose (2006), Gulen (2000), Oellermann, Brorsen and Farris (1989), Allen and Som (1987), Bigman, Goldfarb, and Schechtman (1983) and many others report

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evidences of efficient commodity markets. However, inefficiency evidence has been found in work of Inoue and Hamori (2012), Soni and Singla (2012), Easwaran and Ramasundaram (2008), Mananyi and Struthers (1997), Schroeder & Goodwin (1991) and many others while mixed results have been found in the studies of Goss (1981), Aulton, Ennew, and Rayner (1997), MacDonald and Taylor (1988a), Wang and Ke (2005), Singh (2004), Mckenzie and Holt (2002) etc.Commodity futures market can perform the function of price risk management provided the commodity futures markets are efficient. Efficient futures market leads to integrated price structure throughout the country, and helps balance supply and demand position throughout the year. Thus it is imperative to analyze commodity market efficiency.

Over the globe, gold is one of most traded commodity. However, there are a few studies on gold futures market efficiency. Also, none of the studies in literature analyses price risk management role of gold futures in India with reference to global financial crisis of 2008-09.Thus, this study aims at investigating the gold futures role in managing price risk related to gold spot market. The sample data on daily closing spot prices and futures prices of gold is obtained from the website of Multi Commodity Exchange (MCX), India. The sample period is from 6th June 2005 to 31 March 2017.Since during this period global financial crisis occurred that is expected to have affected the gold market, the data has been divided into two sub-periods viz. pre-crisis and post-crisis periods. The pre-crisis period encompasses of 971 observations spread over 6th June 2005 to 13th September 2008, and post-crisis period encompasses of 2354 observations spread over 15th September 2008 to 31st March, 2017.

Literature Review

Price risk management is an important function of futures market. To effectively perform this role, futures market has to be efficient. In literature, most of the studies are focused on market efficiency. Goss (1981) reports that futures market of copper and zinc are efficient but tin and lead to be inefficient. However, Bigman, Goldfarb, and Schechtman (1983) find wheat, corn and soybean futures markets are efficient for short maturity contracts. Allen and Som (1987) conclude that London Rubber Market is weak form efficient. Oellermann, Brorsen and Farris (1989) report that the futures price leads the feeder cattle cash price and futures market play price discovery function for live cattle.

In a study on live hogs markets by Schroeder & Goodwin (1991), they find evidence that the two price series are not cointegrated but there is information transmission from futures to cash market and occasional feedback from cash to futures. Mananyi and Struthers (1997) find evidence of inefficiency in cocoa market at the London Futures and Options Exchange. However, Mckenzie and Holt (2002) using modern time series methodology suggest that futures markets of select commodities are efficient and unbiased in long run. Using GQARCH-M-EC, they however find corn and cattle futures markets to be inefficient and biased in short-run.

Similar mixed results were reported by Holly and Ke (2005). They conclude that soybean futures market are weakly efficient while the wheat futures market are inefficient due to over-speculation and government intervention. Meanwhile, the results of He and Holt (2004) indicate that the lumber, OSB and NBSK weekly spot and futures prices series are neither cointegrated nor unbiased i.e. markets are inefficient. On the contrary, Xin et al. (2006) report that Chinese copper and aluminium futures markets are efficient.

In India, similar findings are indicated in the results of Lokare (2007). He finds that spot and future prices of the sample commodities (except sugar and nickel) are cointegrated. They report that most of the commodities show improved operational efficiency. Singh (2007) explore arbitrage opportunities acrossMCX, NCDEX and NBOT exchanges and find evidences of cointegration

between the soya oil futures prices on these exchanges. His results also suggest that CBOT has relatively high hedging efficiency than these three domestic national exchanges. Sahoo and Kumar (2009) report that the five sample commodity futures markets in India are efficient and there is no evidence of their inflationary effect.

Singh (2009, 2010)find thatguar gum, guar seed and castor seed spot and futures markets were cointegrated and unbiased. Similar results are reported by Kaur and Rao (2010) in their study on the weak form efficiency of guar seed, refined soya oil, chana and pepper futures markets. The results of autocorrelation show that all select commodities but refined soya oil futures markets are efficient. The results of run test indicate that futures markets for all the select commodities are efficient. Pavabutr and Chaihetphon (2010) conclude that standard gold futures market performs price discovery function at MCX. They also find that mini gold contracts aid upto 30% in price discovery process probably due to efficient information flow in the market.

Also, Ali and Gupta (2011) conclude that futures market is efficient for all select commodities except rice and wheat. They also report that for 6 out of 12 select commodities (Sugar, Castor Seed, Wheat, Soybean, Guar Seed and Chickpea), futures prices granger cause spot prices and for other 3 (Cashew, Rice and Red Lentil) spot prices granger cause futures price. However, the relationship is bi-directional for rest of the select commodities. Similarly, Sehgal et al. (2012) find that markets were efficient for all ten but one commodity (turmeric). However, their results indicate two-way causality for all select commodities except turmeric.

However, Soni and Singla (2012) investigate and conclude that guar gum futures market are inefficient. The possible reason for market inefficiency has been attributed to over-speculation/ market manipulation. Inoue and Hamori (2012) in their study on MCX-comdex report that the commodity futures market is inefficient for the entire sample period but not for the sub-period July 2009 to March 2011. In a study on argo-commodities futures and farmers, Murthy and Reddy (2012) find that in case of chilli and turmeric, futures prices influence spot prices. They also suggest that “majority of the farmers are not aware of the commodity futures trading and hence do not participate in futures trading”. Similar results on efficiency are found by Gupta and Ravi (2013) in a study on agro-commodity futures market at three leading national commodity exchanges in India.

Yaganti & Kamaiah (2012) find that the spices futures market performs price discovery in nearby month contracts while base metal futures market performs for all the three type of contracts. But turmeric and cardamom futures markets lack cointegration for far month contracts. They also conclude that hedging is more effective in case far and nearby month contracts. Similarly, Arora and Kumar (2013) report that copper and aluminium futures markets perform price discovery function and there exists a bidirectional causality betewen futures and spot markets. Also, futures markets are more efficient than spot markets for both the metals. However, Mahalik et al. (2014) in their study on agri, metals, energy and aggregate commodity indices conclude that these futures markets except metals perform price discovery function. Further they report that there is volatility transmission from futures to spot market in MCX energy and MCX comdex, but reverse spillover in case of MCX agri.

Kakati (2014) study the price discovery function of futures market in India. She reports that for 16 out of 20 sample commodities, futures and spot prices converge at maturity. Further, she reports that price discovery takes place in futures market in case 7 commodities and in spot market in case of 2 out of 15. Granger causality results indicate that only 6 agro-commodities futures markets perform price discovery role.Broll et al. (2015) show that the firm’s optimal futures position depends on the nature and sign of expectation dependence. Malhotra and Sharma

(2016) report long run equilibrium between the spot and futures guar market. They infer that the gaur seed futures market performs price discovery function while spot market causes increased volatility in futures market.Arora and Sandhar (2017) investigate hedging efficiency of crude oil futures traded at MCX, India. Their results indicate that crude oil futures market at MCX efficiently performs hedging function.

From literature, we can see that there a few studies on gold futures market's role to predict future spot price of gold. Knowing the demand, use and importance of gold in India, there is a great scope for this type of study. Thus, we are motivated to study price discovery in gold futures market in India.

Objectives of the study

With this background, in this study we intend to investigate price risk management function of gold futures market over two sub-periods (pre-crisis and post-crisis) by

a) Analyzing gold futures and spot markets for long run equilibrium, and

b) Examining lead-lag relationship between gold spot and futures market at MCX India

Data

This study uses secondary data on daily closing prices of gold in spot and futures markets. The sample period is from 6th June 2005 to 31 March 2017.The data has been divided into two sub-periods viz. pre-crisis and post-crisis periods. The pre-crisis period encompasses of 971 observations spread over 6th June 2005 to 13th September 2008, and post-crisis period encompasses of 2354 observations spread over 15th September 2008 to 31st March, 2017. The data is collected from the website of MCX, India. The spot market of gold is Mumbai. Natural log (ln) series have been used here. This study has used software like MS excel and Eviews 8 for analysis of data.

Research Methodology

Summary Statistics and Test for Normality / Efficiency

It gives basic information like mean, median, mode, kurtosis and skewness etc. Positive or negative value of skewness shows that the data is positively skewed or negatively skewed respectively. Similarly positive or negative value of kurtosis shows that the data is leptokurtic or platykurtic respectively. Jarque Beratest calculates the following test statistics

$$JB = n\left[\frac{S^2}{6} + \frac{(K-3)^2}{24}\right] \qquad \ldots\ldots \quad (1)$$

Here, the null hypothesis assumes that the distribution is normal. If the null hypothesis is rejected then the market is said to be inefficient.

Augmented Dickey Fuller (ADF) Test: It is most widely used stationarity test. The ADF test consists of estimating the following regression.

$$\Delta Y_t = \alpha + \beta_1 t + \beta_2 Y_{t-1} + \beta_3 \sum_{i=1}^{m} \Delta Y_{t-i} + \epsilon_t \quad \ldots\ldots \quad (2)$$

where ΔY_{t-1}, ΔY_{t-2} etc. are lags of difference terms. Here, Akaike Information Criterion (AIC) has

been used to determined the number of lags of ΔY_t. The null hypothesis assumes that the series is non-stationary. It is important to first test the stationarity of given series before applying cointegration. The two series are expected to be non-stationary on levels and stationary on first differencing.

Johansen's Cointegration Approach

If a linear combination of two non-stationary variables is I(0) i.e. stationary then the variables are cointegrated. In other words, the variables have long-run relationship. For *Johansen's cointegration* test, a VAR model with k lags containing the given two variables is represented as follows:

$$\Delta Y_t = \mu + \Pi Y_{t-1} + \sum_{i=1}^{k-1} \Gamma_i \Delta Y_{t-1} + \varepsilon_t \qquad \ldots . \quad (3)$$

Johansen test uses two test statistics to test cointegration. These are λ_{trace} is trace statistics and λ_{max} is max eigen value statistics. We assume that the data has linear deterministic trend. The given series are expected to bear a long-run relationship. This will be analyzed in empirical section of this paper.

Granger Causality Test

Granger causality test can be represented as a bi-variate of k[th] order VAR as given below:

$$Y_t = \alpha_0 + \sum_{i=1}^{k} \alpha_i Y_{t-i} + \sum_{j=1}^{k} \beta_j X_{t-j} + \epsilon_t \qquad (4)$$

$$X_t = \gamma_0 + \sum_{i=1}^{k} \gamma_i X_{t-i} + \sum_{j=1}^{k} \delta_j Y_{t-j} + \epsilon'_t \qquad (5)$$

Where X_t and Y_t are gold and gold spot price series variables, $\acute{a}_0$ and $\tilde{a}_0$ are constant drift terms, and ϵ_t and $'_t$are error terms. If *y (or x)* Granger causes *x (or y)* then the lags of *y (or x)* should be significant in the equation of *x (or y)*. In this case, it would be said that there is one-way causality running from *y (or x)* to *x (or y)*.

Empirical Findings

We first check the data for outliers if any. It is crucial to remove outliers otherwise we may have distorted data distribution. Further, outliers may interfere with the econometric analysis leading to biased results. The sample data does not contain any outlier. So we proceed to summary statistics followed by econometric analysis.

Summary and Jarque Bera Statistics

Table 1 depicts the descriptive statistics of logarithmic returns on gold spot price (SP) and futures price (FP) for two sub-periods. Here, we have used natural logarithmic returns on the

two price series using formula, $r = log\left(p_t/p_{t-1}\right) * 100$. The table shows that the returns exhibit non- normal distribution as the values of skewness and kurtosis are non-zero. The non-normal distribution is confirmed by Jarque Bera test results for both the sub-periods at 5% level of significance. It indicates that both spot and futures gold markets are inefficient. In post-crisis, a decrease in mean return and return volatility is observed in both spot and futures markets. To further confirm it, we conduct statistically more robust tests.

Table 1: Summary and Jarque Bera (JB) Statistics

	Pre-Crisis		Post-Crisis	
	Log Return on Gold Spot Prices (RSP)	Log Return on Gold Futures Prices (RFP)	Log Return on Gold Spot Prices (RSP)	Log Return on Gold Futures Prices (RFP)
Mean	0.064050	0.064932	0.037990	0.038144
Median	0.070023	0.116620	0.051760	0.000000
Std. Deviation	1.073286	1.105851	1.056400	0.943768
Skewness	-0.659188	-0.688116	-0.163591	0.383900
Kurtosis	7.508273	6.257192	10.71404	13.29500
J B Probability	0.000000	0.000000	0.000000	0.000000

Unit Root Test

From Figure 1 and 2, the two series seem to be non-stationary as they are trending upwards. Here, we have used ADF and PP unit root tests as confirmatory tests. The results for log series and their log returns for two sub-periods have been shown in Table 2. It is evident from results that the log series of both spot and futures prices are non-stationary on levels at 5% significance level. So, these results confirm the findings of graphical analysis. However, the returns series (i.e. first difference of price series) are found to be stationary. The results are similar for both pre-crisis and post-crisis periods. In other words, we can say that both the log price series are integrated series of first order i.e. *I(1)* inboth pre-crisis and post-crisis periods. Thus, we may proceed to test cointegration relationship between the given log price series.

Table 2: ADF and PP Test Results on Levels for Pre and Post Crisis Periods

		ADF		PP	
Variable	**Model Form**	**Test Statistics**	***p*-value**	**Test Statistics**	***p*-value**
Pre-Crisis					
$\ln(SP_t)$	Intercept	-1.788411	0.3865	-1.788237	0.3866
	Trend and Intercept	-2.036947	0.5798	-2.096194	0.5468
$\ln(FP_t)$	Intercept	-1.734562	0.4135	-1.734310	0.4136
	Trend and Intercept	-1.932137	0.6367	-2.019167	0.5896
Return on $\ln(SP_t)$	Intercept	-30.69714	0.0000	-30.69706	0.0000
	Trend and Intercept	-30.70988	0.0000	-30.70988	0.0000
Return on $\ln(FP_t)$	Intercept	-31.25086	0.0000	-31.27545	0.0000
	Trend and Intercept	-31.26614	0.0000	-31.28283	0.0000
Post-Crisis					
$\ln(SP_t)$	Intercept	-2.710493	0.0723	-2.674897	0.0786
	Trend and Intercept	-1.929694	0.6385	-1.971086	0.6162
$\ln(FP_t)$	Intercept	-2.616662	0.0897	-2.634754	0.0861
	Trend and Intercept	-2.059869	0.5674	-2.035622	0.5809
Return on $\ln(SP_t)$	Intercept	-48.98858	0.0001	-49.01328	0.0001
	Trend and Intercept	-49.05469	0.0000	-49.07045	0.0000
Return on $\ln(FP_t)$	Intercept	-51.16039	0.0001	-51.10335	0.0001
	Trend and Intercept	-51.21841	0.0000	-51.16765	0.0000

Critical values for Intercept and Trend & Intercept forms are -2.863 and -3.412 respectively.

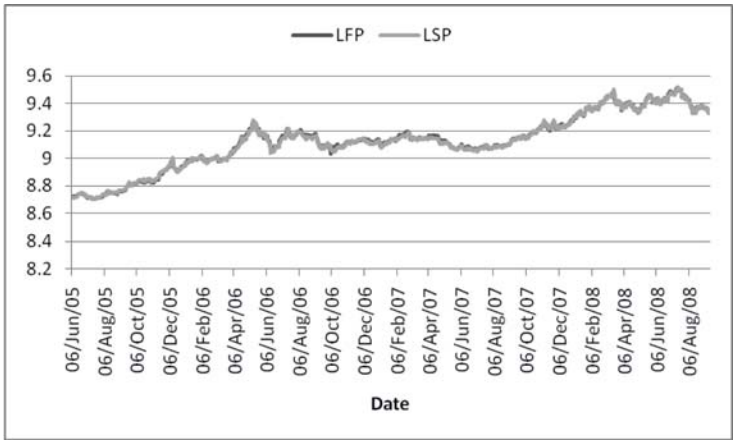


Figure 1: Gold Spot and Futures Price Movements in Pre-Crisis Period

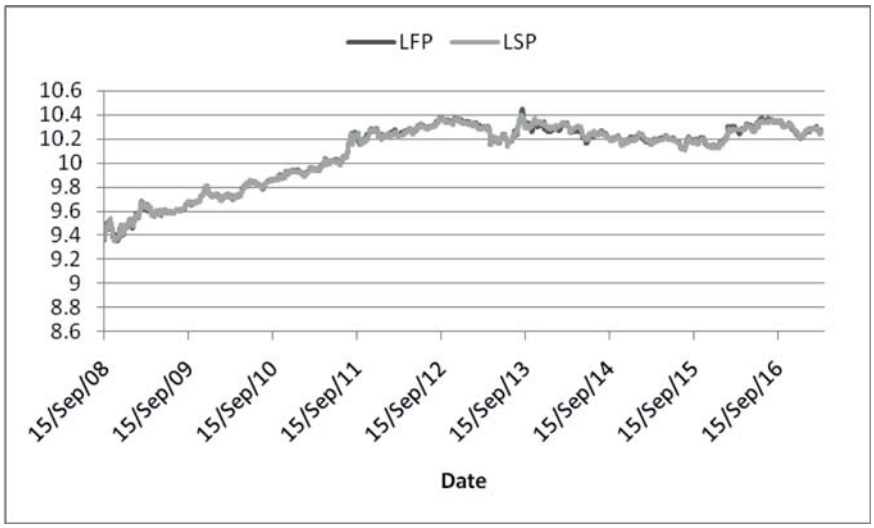


Figure 2: Gold Spot and Futures Price Movements in Post-Crisis Period

Johansen Cointegration Test

From Figure 1 and 2, futures prices and spot prices of gold seem to be cointegrated. To analytically examine cointegration, we run Johansen's cointegration test. We have used AIC criterion to determine optimal lag length (k), here it is k=6. The results shown in Table 3 indicatethat LSP (logged spot price) and LFP (logged futures price) series are cointegrated in pre-crisis period with one cointegrating relation at 5% level of significance.In post-crisis, the null hypothesis of 'no cointegrating relation' is rejected at 5% level of significance. The null hypothesis of 'at most one cointegrating relation' is also rejected at 5% but cannot be rejected at 1% level of significance. Thus, we can say that the two series are cointegrated in both the periods, i.e., spot and futures markets of goldbear long run equilibrium. This is one of the important basic conditions for futures market to perform price discovery and risk management. Similar results were obtained by Sahoo and Kumar (2009), and Pavabutr and Chaihetphon (2010).

Table 3: Johansen Test Results for Pre-crisis and Post-crisis periods

Period	Hypothesised No of CE(s)	Eigen Value	λ_{trace} Statistics	Prob. For Trace Test	λ_{max} Statistics	Prob for Max eigen value Test
Pre-Crisis	r=0 (None)	0.0409	43.58408 (15.4947)	0.0000	0.04095 (14.2646)	0.0000
	r≤1 (at most 1)	0.0034	3.270765 (3.8414)	0.0705#	0.003387 (3.8414)	0.0705#
Post-Crisis	r=0 (None)	0.0294	74.53599 (15.4947)	0.0000	70.05265 (14.26460)	0.0000
	r≤1 (at most 1)	0.0019	4.483348 (3.8414)	0.0342*	4.483348 (3.8414)	0.0342*

Note: The critical values have been shown in parentheses. # and * represents insignificant results at 5% and 1% level of significance respectively.

Granger Causality Test

From Table 4, the null hypothesis of 'no causality' from log return of gold spot prices (*RSP*) to log return of gold futures prices (*RFP*) is rejected at 5% level of significance. It means RSP Granger causes RFP. Also, the null hypothesis of 'no causality' from log return of gold futures prices (*RFP*) to log return of gold spot prices (*RSP*) is rejected at 5% level of significance. It means there is bidirectional causality between spot and futures gold market. In signifies that gold futures play an important role in price discovery with some feedback from spot market in both sub-periods. However, the price discovery role of gold futures markets has strengthened after the crisis.

Table 4: Granger Causality Test Results for Pre-crisis and Post-crisis periods

Null Hypothesis	Pre-Crisis		Post- Crisis	
	F-Statistic	Prob.	F-Statistic	Prob.
RSP does not Granger Cause RFP	192.187	0.0000*	4.04555	0.0005*
RFP does not Granger Cause RSP	2.32004	0.0314*	196.399	0.0000*

*Note: * represents significant results at 5% level of significance.*

Research Implication

Overall, we may conclude that the gold spot and futures markets are cointegrated and exhibit a causality relationship with each other. Similar results were obtained by Sahoo and Kumar (2009), and Pavabutr and Chaihetphon (2010). We further infer that Gold futures market plays a critical role in price discovery in pre-crisis as well as post-crisis period. Thus, the market participants like companies in gold industry, importers/exporters and jewelers can take position in gold futures market (buy or sell gold futures) to hedge their spot market position and hence manage price risk associated with trading in gold.

Concluding Remarks

This study investigates the gold futures role in managing price risk related to gold spot market from.The sample period from 6th June 2005 to 31 March 2017 covers a major economic event of global financial crisis of 2008.Thus, the data has been divided into two sub-periods viz. pre-crisis and post-crisis periods. The results of Johansen's Cointegration test indicate that the gold spot and futures markets are cointegrated in both the sub-periods. Granger causality test results show that there is bidirectional causality between spot and futures gold market. In signifies that gold futures play an important role in price discovery with some feedback from spot market in both sub-periods. However, the price discovery role of gold futures markets has strengthened after the crisis. Thus, we conclude that gold futures performs price risk management function at Multi Commodity Exchange, India. Thus, the market participants like companies in gold industry, importers/exporters and jewelers can take position in gold futures market (buy or sell gold futures) to hedge their spot market position and hence manage price risk associated with trading in gold.

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December 11-13, 2017
Delhi School of Management, Delhi Technological University, Delhi
pp. 189-194

Contribution of Financial Inclusion in the Growth of Indian Economy: An Exploratory Study

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Abstract

The financial inclusion includes the creative and innovative financial services provided to rural areas which are important for the growth of the rural population which leads to growth of the economy. This will enable the rural household to generate fund for their livelihood. The contribution of Self Help group and Micro Finance Institutions apart from commercial banks is also necessary for the success of Financial Inclusion in rural and semi urban areas. The primary objective of the study is to analyse the role of commercial Banks in the growth of Financial Inclusion. There are two other secondary objectives which we will cover in our study. The methodology which will be used in this research is partly descriptive and partly exploratory. The secondary data is used for this purpose like Magazines, Newspapers, Research Articles, Research Journals, E- Journal, etc.

Keywords: Financial Inclusion, Financial Literacy,semi urban, Rural Population, Innovation

Introduction

Financial inclusion is the procedure of securing access to financial services on time and sufficient credit where required by vulnerable groups such as low income groups and weaker sections at a lowest cost. Financial inclusion widens the resource platform of the financial system by processing a customs of savings among large section of rural population and plays very significance role in the process of development of economy. Financial inclusion means connecting each and every person, including those people living in rural areas, to a well-functioning of financial system. This would involve easy access to bank accounts for safe parking of savings; availability of low-cost credit through accurately designed loans for poor, lower level income households and small businessman, and accessibility of basic financial products like insurance.It also includes many institutions like LIC, self-help groups, banks, post offices and micro finance institutions, etc. But this study has taken only financial inclusion through banking. Banking includes loans, savings, credit payment, ATM and number of offices,etc.

Financial Inclusion is specifically based on the principal of equity and inclusive growth and will be the catalyst to empower the poor to contribute to the social and economic growth of India. According to 2011 census, 14.48 crore households were availing banking services out of 24.69 crore households which comes out to be almost 58.7 percent of total households. Services were not being availed by almost 10 crore households.

The Branchless banking assures to provide the financial institution focussing mainly on the poor and unbanked ones on a large scale.

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Financial Inclusion operates on two of the following pillars:

1. Special Help Groups(SHG)
2. Business Correspondent Model (BC).

The Committee on Financial Inclusion in India

Dr. C. Rangarajan the Chairman of the Committee on Financial Inclusion delivers the need of financial inclusion as "Address to finance by the poor and weak groups is required in advance for reducing poverty and social development. This has to become a constitutional part of our efforts to proceed inclusive growth. It also provides delivery of financial services at an affordable charge to the huge segments of the disadvantaged and lower level-income groups. The main objective of financial inclusion is to automate the scope of financial activities of the structured financial system which include within its power to control people with low incomes.

The Committee suggested, "A National Rural Financial Inclusion Plan (NRFIP) may be introduced defining a clear and specific goal in order to provide proper access to clear cut financial services which includes credit of at least 50% which depicts the exemption of about 55.77 million households by 2012 via rural or semi-urban branches provided banks of Commercial Banks and Regional Rural Banks. Financial inclusion could be clearly stated as the processof confirming and verifying an access to financial products and services needed by unprotected groups which covers weaker sector and low- income groups at moderate cost in true and transparent manner by conventional institutional players.

Objectives

1. To study the role of commercial Banks in the growth of Financial Inclusion
2. To explore the inter connectivity between the RBI and Government of India.
3. To study the benefits of Financial Inclusion on rural population.

Research Methodology

Research methodology used is partly descriptive and partly exploratory. For this study data and information has been collected with the help of Magazines, Newspapers, Research Articles, Research Journals, E- Journal, etc.

Review of Literature

Dr. Vigneswara Swamy and Dr. Vijayalakshmi (2009) suggested the study on Role of Financial Inclusion for Inclusive Growth in India - Issues & Challenges and concluded that it has further reaching results, which can help many people come out of drastic effect of poverty situations. Financial inclusion providesaccess to payments system, formal identity and deposit insurance therefore; to enlarge the scope of activities of the structuredfinancial system to include in its ambit people with low- level incomes is the main objective of financial inclusion.

Vijay Kelkar (2010) considered in his article Financial Inclusion for Inclusive Growth that increased financial inclusion will drastically cut-down the farmers' indebtedness, which is one of the most important causes of farmers' suicides. The second main benefit is that it will take to more rapid growth of modernization of Indian agriculture.

Gupta, V. (2015). Pradhan Mantri Jan-Dhan Yojana: An Effort towards Financial Inclusion states that the requirement for financial inclusion in India was to involve the financially excluded people, who were not able to operate the financial services rendered or provided by banking and financial institutions.

Dougherty, J., & Dogandjieva, R. (2015). The Elephant in the Room: Financial Inclusion for the Missing Middle. Innovations suggested that Technology can be a very useful tool in supplying access to financing or banking products in remote areas. Merely ATMs still are not recognised user friendly by the population who are illiterate and unknown user of technology. Banks, in this case, needs to reconstruct the design the technology which has been already exist, which creates a better attainability for traditional users to easy access technology.

Peric, K. (2015). Digital financial inclusion concluded that it is impossible for banks and concerned allocators to make changes in existing financial system overnight but fruitful plan and quick action will take bank to the lower most of the pyramid sections which may not be a considered profitable plan for banks but the maximum number of beneficiaries will exceed and possibility of profitable ratio will be in larger volumes.

Financial Inclusion in India

In developing countries, India has a long way to go to ensure financial inclusion. About half of population does not have access to bank accounts while three fourths is not covered by any form of insurance. The Government of India and the Reserve Bank of India have been making concerted efforts to promote financial inclusion as one of the important national objectives of the country. Some of the major efforts made in the last five decades include - nationalization of banks, building up of robust branch network of scheduled commercial banks, co-operatives and regional rural banks, introduction of mandated priority sector lending targets, lead bank scheme, formation of self-help groups, permitting BCs/BFs to be appointed by banks to provide door step delivery of banking services, zero balance Basic Saving Bank Deposit (BSBD) accounts, etc. The fundamental objective of all these initiatives is to reach the large sections of the financially excluded Indian population. Further, for achieving the targeted goals, RBI has created conducive regulatory environment and provided institutional support for banks in accelerating their financial inclusion efforts.

RBI has adopted a structured, planned and integrated approach towards Financial Inclusion which is focusing on improving access to financial services and also encouraging demand for financial services through financial literacy initiatives.

Importance of Financial Inclusion

Easy access to financial services will allow the population leaving in lower strata, to save money safely and help in preventing concentration of economic power with a few individuals, thus mitigating the risks that the poor could face as a result of economic shocks. Therefore, providing access to financial services is becoming an area of concern for the policymakers as it has far reaching economic and social implications. In India, The single most frequently used source of loan for medium Indian household is still moneylender. Large parts of our financial system are still hampered by political intervention and bureaucratic constraints, limiting their potential contribution. India's poor population who work as agricultural and unskilled,semi skilled wage laboures and low salaried workers are largely excluded from the formal financial system. Even micro and small enterprises, facedifficultto deal with the formal banking system due to unavailability of financial literacy in their areas and thus are largely excluded from financial system. Over 40% of India are working just to earn their living but not to save for their future. For the growth and development of poor following are the few major importance of Financial inclusion

i. Control on the spurious money lenders

ii. Equitable growth in rural and urban areas

iii. Direct linkage between the government and beneficiaries like making mayments under different government schemes by electronic payments

iv. Bringing the plateform for the savings of the poor people through channelizing them into investment

Benefits of Branchless Banking in India

Branchless Banking supported the expansion of financial inclusion in different parts of rural , semi urban India and the benefits for the same are as follows:

i. Financial Support to Rural areas

Through Financial Inclusion, it gives the privilege to the lower sector of the society to save some money to manage their financial crisis which they face very often in their life. Financial inclusion gives a reliable path to them to take credit facility, invest their money safely for their future.

ii. Credit Support

Prior to the financial inclusion, rural people used informal channels which made the poor dependent on other. With financial inclusion it gives the benefit to the poor to avail the credit facility at nominal rates to support their aspirations and promote self owned business.

iii. Circulating the low cost deposits: Large number of low cost deposits provides the bank an opportunity to reduce their dependence on bulk deposits which support the liquid risk management and manage the mismatch of assets and Liabilities.

With the support of Financial Inclusion, money flow is floating directly to the beneficiary from Government of India to provide subsidies and growth plan for rural area.

Various approaches to achieve financial inclusion

In India, various measures taken by banks, GOI and RBI for financial inclusion plan. Figure 3 highlighted currently adopted financial inclusion approaches.

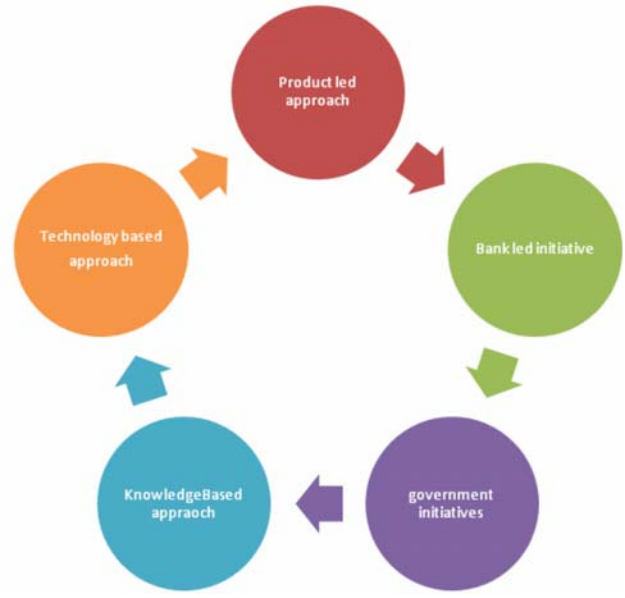


Figure 1: Financial Inclusion : currently adopted approaches

1. **Product Based Approach:** Reserve bank of India has been positive, open minded and encouraging while making policies to enable financial institutions to work uponcreative products for enabling a common man to avail the benefit of the financial inclusion plan. Some products developed under this approach are as follows.
    i. No- Frills Account (NFAs)
    ii. Kisan Credit cards (KCCs)
    iii. General Purpose Credit Cards (GCC)
    iv. Saving account with Overdraft facility: -
2. **Bank Led approach:**
    i. Self Help Group - Bank Led Initiative (SLBP
3. **Technology Based approach:**
    i. Mobile Banking
    ii. Kiosk / ATM based banking: -
    iii. Branchless Banking:
    iv. Aadhaar Enabled payment services
4. **Knowledge Based Approach**
    i. Financial Stability Development Council (FSDC).
    ii. RBI had issued guidelines on the financial literacy Centres (FLC)

5. Governments Initiatives: The government has taken various initiatives indirectly through the regulators, government promoted schemes through its various ministries. Some such initiatives have been listed below.

i. Induction of SHG-2
ii. Women SHGs Development Fund
iii. Swarnjayanti Gram Swarozgar Yojana (SGSY
iv. National Rural Livelihood Mission (NRLM

Measures by RBI and Government towards Financial Inclusion

1. Growth of Cooperative Banks
2. Setting up of State Bank of India
3. Nationalization of banks
4. Lead Bank Scheme
5. Service Area Approach
6. Self Help Groups

Government of India has initiated with the following measures:

i. They have constituted two funds:

Financial Inclusion Fund is for the cost coverage on developmental and promotional interventions involved in financial inclusion.

Financial Inclusion Technology Fund is for meeting the cost of technology adoption for the introduction and promotion of Financial Inclusion.

ii. Aadhar Card: Government has decided to provide the Unique Identification Number to every individual in India which smoothen the process of Financial Inclusion

iii. Swabhiman: Government has provided this facility in urban areas to cop up the developmental gap between the rural and urban areas. It provide the basic facililities like opening of bank accounts, remittance facilities, need based credits , financial literacy to unbanked villages where the population is more than 2000.

Conclusion

Creative banking products for the support of poor people, effective regulations by RBI and bringing technology all together can change the existing status of the financial inclusion. Banks should work upon the customer friendly and profitable business for all by providing out of the box services. Government of India is trying to educate the rural area population and reduce the financial exclusion. But educating the poor population alone is not sufficient to achieve our objectives. The banking expert after evaluating the banking performance indicates the achievement of National project of Financial Inclusion.There is a close relation between the growth and development of the country and financial inclusion. As we will reach the targets of achievements of Financial Inclusion, our GDP will also start improving with the related parameters of Financial Inclusion. This achievement is possible only through proper mechanism which channelizeseveryone from top to bottom.

Recommendations and Limitations

Government of India has brought another economic reform by introducing the financial inclusion. This is the major initiative to make India, a Global economic hub for investment. This reform was mandatory to upgrade the level of poor in rural and urban India to providing support of financial services to make them feel secure and economic stable. It brings financial stability, economic stability and inclusive growth in the country.

i. There is a need of making the process more systematic.

ii. There is a need of cost management.

iii. Good digital connectivity is required to make the process technology friendly.

iv. Efficiency in payment system.

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Ingredients of Startup Success

Abhishek Kumbhat[1] and Sushil[2]

Abstract

Startups and ecosystem around them have become a new contributor to economy and career paths for youngsters. On one hand, where the low entry barrier for youngsters to commence startups at times without being worried about a sustainable business, on the other hand the extremely high failure rate of startups has raised concern over sustainability of the whole eco-system. A number of researchers and industry experts have talked about do's and don'ts for young entrepreneurs, however most of them have either talked about a very specific industry, culture or country or they have been focused on a specific set of expectations from startups and entrepreneurs thereof. This paper proposes a very comprehensive, yet generic and practical list of success factors for startups - the ingredients of startup success. These ingredients flock around attributes associated with value proposition offered by the startup, resources of the startups - especially the founders, target market - industry, customer and competition, cost and revenue structures, and other environmental variables. A deeper look at these success factors not only help the entrepreneurs build a right recipe of success for their startup, but also help the investors evaluate the startup for a prospective investment.

Keywords: Success Factors, Ingredients of success, Startups, Entrepreneurship, startup success, failure factors.

Introduction

In recent years, new age startups have become a key contributor to socio-economic prosperity of each country. Blank (2015) explained this as a critical tipping point of economic transition from industrial era to information era businesses, whereby each declining industrial era company is getting replaced with high-growth technology startups in information era; whereby the top nine big companies of the tech world, that didn't exist 15 years ago, have collectively created a new wealth of almost a trillion dollars as compared to $15 trillion worth of the entire U.S. GDP. More interestingly, Pink (2005) introduced the conceptual age of creativity and entrepreneurial attitude; whereby after industrial and information age, a new wave of entrepreneurship and a massive ecosystem to support it. While there is a lack of formal data about the numbers of new businesses starting worldwide, a few researchers estimate that almost 100 million startups open every year (Mason, 2004; Get 2 Growth, 2014).

Low cost of setup, quicker adoption of new technology by consumers, easier access to funds and entrepreneurship been evolved as an independent management stream have contributed to the explosive growth of startups (Blank, 2015). In addition, the changed economic environment

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powered by the startup ecosystem has given a celebrity status of founders of large startups, resulting in very high youth attractiveness towards entrepreneurship (Kumbhat, 2017). A good number of young entrepreneurs commenced startups without any thought over implementable and sustainable business models and this flood of startup businesses is supported by a huge inflow of funds and investor appetite to invest in high risk startups. However few of the recent data show (Chanchani, 2015) that while the amount of funds raised by startups is increasing year on year, the number of deals has not grown in the same order. The investors have been much more careful in selecting the right startup and have preferred to invest in startups only post validation stage of its development, instead of just at discovery stage (Kumbhat & Sushil, 2017).

Increased rate of startup failure or termination, up to the order of 90% (Mason, 2004; Patel, 2015) and number of startup founders returning back to a standard employment (Julka, 2015) have further strengthened the concern about sustainability of this ecosystem. More so, this concern has spread not only to investors, but also to new entrepreneurs, economists and researchers. Especially researchers have dwelled on whether a well-defined framework for success of a startup could be drafted, and thereby published numerous research papers showcasing do's and don'ts for a startup. Some of these studies are either associated with a particular industry or a limited geography or country, therefore at times resulting in contrary generalization due to these contextual differences. In addition, a number of scholars have proposed and analyzed various success factors associated with either venture survival or venture performance, having assumed their own definitions for survival and performance.

The objective of this paper is to propose a comprehensive, yet generic list of success factors - the ingredients for startup success. Understanding of these factors is important from the perspective of, not only the investors to find a better prospect for return on their investments, but also entrepreneurs to incorporate the desired recipe of success in their startup.

Ingredients to Success

A raw, un-compiled and un-categorized long list of ingredients for startup success can lead to confusion in the minds of entrepreneurs, leading to wrongful implications; therefore it is very important to have a well-structured categorizationof these ingredients. Such possible categorization may either be based on business model components like value proposition, market, resources, partners, cost and revenue structures (Huarng, 2013; Dubosson-Torbay et al., 2002; Osterwalder and Pigneur, 2010) or be based on dimensions of development stages like objective, product, customer, finance, business model, revenues, team and culture (Churchill and Lewis, 1983; Kumbhat and Sushil, 2017).However, few of the components of business models or dimensions of development stages, may not have any specific success factor. Therefore both the options of categorization may lead to mere academic exercise, than practical implementation. Therefore this paper proposes a comprehensive list of startup success factors with a very practical categorization of such factors such as attributes associated with value proposition offered by the startup, resources of the startups - especially the founders, target market -industry, customer and competition, cost and revenue cost structures, etc.

Factors related to Product Offering

Value Drivers

The four value drivers associated with offered product or service (the value proposition) as proposed by Amit and Zott (2000) play a critical role in startup success. Startup's ability to offer transaction efficiency, which is achieved by improved information sharing between seller and buyer, by offering a large range of options to choose from and by assisting to perform

quicker decisions, results in decreased cost per transaction, thereby creating an easy pull for prospective customers. Startups can also leverage extra potential by offering a range of complementary products / services to their customers, such complementary items can either be vertical complementarities (e.g. after-sales service) or horizontal complementarities (e.g. one-stop shopping, or cameras and films).In addition, the ability of a startup to lock-in (motivating customers for repeat transactions - stickiness) prevents customers' migrationto competitors and increases number of transaction by a single customer. This increased retention and increased life time value of a customer can be achieved by a startup using customer lock-in features, typically implemented either through internal means (loyalty program, brand, IP) or external means (network effect). In addition, novel business models (beyond just the innovative products or services) focus on value creation by capturing hidden consumer needs, by creating new markets and by appropriate selection of participating parties. A startup can create lock-in (increased switching costs) by capturing customer mindshare and developing brand and reputation at a faster pace and much lower costs as compared to its followers.

Innovation

Innovation enhances firm's market strength, improvesits ability overcomecompetitionand reducesits cost of production.Typically younger firms may benefit disproportionately from the opportunities created by innovation due to their greater flexibility; thereby for a startup, it is important to build an innovation culture for better performance. In addition, to some industries which are governed by long R&D cycles, protecting the innovation through IPRs is also critical (Rosenbusch et al., 2011). More so, role of nature of innovation in firm survival and success is dependent on development stage of the startup (Hyytinen et al., 2015). Especially for young and early stage startups, it is important to have mass market oriented innovationthan just at the level of experimentation, as such innovation may lead to excess liability and will question startup's survival. Despite of the core need of innovation for startups, it is equally important to identify the mode of such innovation, especially in the eyes of limited resources a startup has. It is typically observed that disruptive innovations might be easier to develop internally, while incremental innovations might be better pursued with external partners. However better negotiating power of an external collaborator may result into unfavorable terms for young startups, therefore it is advisable for young startups to focus on internal innovation than through external collaborators(Rosenbusch et al., 2011).

In addition, it is always observed that illegal communities not only are pioneers in the use of new technologies and create new markets, but also provide invaluable market insights and help emergence of new legitimate business models for legitimate industry (Choia et al., 2007). Therefore startups should always keep an eye for inspiration from such pirate communities and other sources of radical innovations to find opportunities to reconfigure their business models and emerging technologies for legitimate businesses.

First Mover Advantage & Scope for Late Entrants

An early entry into themarket than later entry, resulting into more profit, market share and higher chances of survival, defines first mover advantage for a firm (Lieberman and Montgomery, 2013). However depending on various market dynamics being a first mover has both advantages(typically in case of Winner-takes-most markets) and disadvantages(typically in early industry evolution stages) (Markides and Sosa, 2013).

Role of first mover advantage for a startup's survival and performance depends on level of industry evolution (Markides and Geroski, 2005), especially early in an industry's evolution, firms that follow "fast-second", utilizing an innovative business model, are more successful.

Typically, when attacked by later entrants, incumbents will fight to the death before giving up. Therefore unless the late entrants have some serious advantages (e.g. superior and patented technology) over the established firms or unless they utilize an innovative strategy to attack, the established firms will most likely win out (Markides and Sosa, 2013).

A startup as a late entrant in the market should adopt an innovative strategy to avoid imitation and disrupt the established players and should typically use three key ingredients in their business model- achieve proximity to the inherent advantages of the value propositions of established firms; achieve competitive advantagein another dimension of the value proposition; and impede leader retaliation by using different and conflicting business model than that of established firms(Christensen, 1997).Alternatively, a startup as a late entrant can even succeed in entering a market without using an innovative business model if this market has already reached maturity and first mover advantages have eroded, which typically do with time.

In addition, the first movers should continuously innovate to maintain the edge through differentiation and to keep shifting the basis of competition, thereby allowing these first movers to continuous leverage first mover advantage, irrespective of later ent rants (Glemet and Mira, 1993), thus resulting in better survival and success for startups.

Quality and Time to market

Product or service quality is paramount to everything to ensure startup survival, way before its success. Startup's ability to beat industry standard product quality and performance can lead to an easy access to customer base, thereby leading to higher chances for its survival and success. In addition, for industries having shorter product lifecycles and are not controlled by intellectual property rights, speed to market is key to product profitability and success. Life time profitability of a product in increased by 33%, in case of six months earlier market entry; on the other hand, if the market entry is six months late, the lifetime profitability will be decreased by 30-35%.

Factors related to Startup Team

Entrepreneur Personality

Starting of a business (entrepreneurial intension) is clearly different from making it survive or succeed (Lucaa et al., 2012). Risk propensity (openness to experiment) is positively related to intention to start a business, while it is negatively related to startup survival or success; average level of risk propensity is linked with firm survival, while extreme (low and high) levels of risk propensity lead to exit from entrepreneurship (Zhao et al., 2010). The need to handle situations that are unstructured and uncertain about the outcome of decisions, makes risk propensity important for successful entrepreneurs than managers (Stewart and Roth, 2001).

Specifically identified personality traits of founders may have better person - entrepreneurship fit and higher chances of startup success (Markman and Baron, 2003). Individuals with higher self-efficacy and achievement oriented attitude not only prefer challenging activities; but also display higher staying power in those pursuits, resulting in high performing entrepreneurs. These successful entrepreneurs, the founders and growth oriented entrepreneurs, showcase better self-confidence to organize and effectively execute actions for outcomes(Stewart and Roth, 2007; Zhao and Seibert, 2006).

Skills for high-potential opportunity recognition and spotting obstacles in-time also lead to the creation of superior ventures. Markman and Baron (2003) also suggested that successful entrepreneurs have significantly higher Adversity Quotient score (Stoltz, 2000) - higher levels of perceived control over adversity; higher ability to withstand and quickly overcome setbacks and

failures; and higher accountability for the outcome of the adversity regardless of its origin. These entrepreneurial personality traits are further explained as big-five or OCEAN (Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism) factors by Brandstätter (2011). In addition, impact of personality traits on entrepreneurship is further explained as differentiation between entrepreneurs and managers (Zhao and Seibert, 2006), as impact on entrepreneurial intentions (Zhao et al., 2010) and as impact on venture survival (Ciavarella et al., 2004).Ciavarella et al. (2004) further suggested that an entrepreneur needs to show conscientious attitude and be averse to experiments, like a manager, for long-term new venture survival. In addition, having attention to details, high level of energies, proactive approach and positive attitude are personality traits of entrepreneurs contributing to successful ventures.

Human and social capital and social skills

Markman and Baron (2003) suggested that during early stages of the startup, while high levels of human and social capital may be particularly crucial in facilitating access to resources, social skills are important to leverage such resources, once attained. Human capital (abilities influenced by genetics - intelligence, health and attractiveness as well as acquired skills - formal education, work experience and interpersonal relationships) offer better access to professional circles for entrepreneurs. In complementary to human capital, strong social capital of entrepreneurs further offers them opportunities enabled through organizational positions, elite institutional ties and social networks and provides access to information and increased cooperation from others; thereby resulting in better chances to receive funds from VCs. In addition, effective social skills help entrepreneurs in raising external capital, generating commitment in employees, attracting effective stakeholders and negotiating with others (Baron and Markman, 2000).

Entrepreneurial Experiences

Founder's prior managerial work experience adds to positive contribution to startup success, and if this prior experience is in the same industry, that too not very far in the past, it adds to this positive contribution especially to set more accurate, realistic and less over-optimistic expectations. Also, industries with higher uncertainty, like high-tech and R&D, are likely get more benefited from founder's industry experience (Cassar, 2014).

While more experienced entrepreneurs are expected to set up better performing startups, as their experience helps them to generalize the knowledge from earlier ventures and effectively apply it to new venture. However this may not stand true, if incorrect inferences and conclusions are drawn from earlier experiences. Interestingly, Toft-Kehler et al. (2013) observed that experienced entrepreneurs may perform rather worse in new venture due to barriers to learning, whichprevent extraction of appropriate knowledge from prior ventures or appropriate application of existing knowledge to new ventures. While content- andcontext- domain differences (industry, geographic, and temporal) between earlier and current ventures results in barriers to learning, on the other hand contextual similarities can not only minimize negative knowledge transfers to new ventures, thus weakening negative experience-performance relationship for novice entrepreneurs but also can additionally strengthen the positive nature of experience–performance relationship for expert entrepreneurs. Toft-Kehler et al. (2013) further concluded that venture performance holds a U-shaped relationship with entrepreneurial experience, i.e. venture performance initially decreases, then increases with increasing entrepreneurial experience. More so, too many failed instances of earlier entrepreneurship rather contribute negatively to startup success, reflecting entrepreneur's barrier to learning.

Baptista et al. (2014) suggested that opportunity-driven entrepreneurs start a new business after finding a promising business opportunity and leave current job for the new business as

opportunity cost. On the other hand, unemployment driven people primarily consider a new business as an option to uncertain future and unemployment, therefore most of the time, such entrepreneurship is started without spending time in search for good opportunities, without building comprehensive plans, without obtaining appropriate funding, and without seeking advice. Hence, it impacts the chances of survival. In addition, prior experience matter only for founders who were not unemployed prior to startup and such founders are indeed more likely to have engaged in opportunity evaluation and are better equipped for opportunity exploitation, while unemployment-driven entrepreneurs are less likely to search and evaluate opportunities, relying on earlier entrepreneurial experience to persevere in early years.

In addition, portfolio entrepreneurs are less likely to face financial constraints for a new firm than serial entrepreneurs, because they can deploy assets from their other firms. Theseportfolio entrepreneurs are likely to provide more network connections and knowledge of potential customers.

Gender

In most of the cases, it has been found that gender of the founder does not impact firm survival or its success. However Kalnins and Williams (2014) found that different industrial and geographic contexts provide different opportunities and constraints for female-owned businesses, impacting firm survival. Unless being in disadvantageous situations to acquire necessary skills, female-owned startups didn't not underperform on firm survival rates than male-owned startups (Robb and Watson, 2012). However, due to female preferences of being risk averse, female-owned firms are typically smaller than male-owned firms.

Attitude towards Radical Innovation

While studying of innovations over last century across the globe, Preston (2001) found that often the market leader brought the radical innovations to the world, but mostly didn't took the same to the market because either it considered it not much market value or feared that such innovation would cannibalize sales of existing profitable products. And, with that attitude of ignoring radical innovation, established players lost major market share to new entrants.

Effectuation

Effectuation (Sarasvathy, 2001), is a thought process to help entrepreneurs in the processes of opportunity identification, decision making and new venture creation. Effectual Thinking of entrepreneurs (What can I achieve with what I have) differentiates them with typical causal thinking of managers (defined delivery with defined resources), thereby making them the right fit for a new venture. Expert entrepreneurs employ effectuation principles in situations of uncertainty (unpredictable future, unclear goals and lack of independent environment), using these principles as as the ultimate selection mechanism. While studying the relationship between effectual principles and venture performance, Read et al. (2009) found that all the heuristics of effectuation except Design and Affordable Loss are positively related to venture performance.

Founding Team

Preston (2001) suggested that chances of success increase dramatically with team size unless the size reaches four or five founders; making a team of two - three founders as most ideal size of founding team. In addition, a founding team members with complementary skills will have a much higher probability of success; more so such teams with core and complementary resources helpleverage the first mover advantage for the startup (Vidal and Mitchell 2013). In addition, a good understanding and relationship among founders result in reduced chances of co-founder conflict, which initially helps a startup to survive and in long term contributes to its success.

Factors related to Other Environmental Circumstances

Market

Evaluation of a target market using product market matrix (existing or new market being targeted through existing or new product) is important to evaluate the startup. On one side where targeting an existing market with existing products does not give any leverage to a startup, on the other hand, targeting a new market with a new product may take a long time for customer education and market establishment, resulting in reduced chances for startup survival. In addition, a startup increases its chance to survive and succeed, if its target market is growing on its own as well as holds good investor attractiveness. Also target market being not already very crowded and having a right product pricing fit of the startup are additional ingredients to startup success. A startup should also target a mass market opportunities, giving it an opportunity to scale and thereby attract easy investments.

Investors

While investors with deep pockets offer a startup better chances to stay afloat till success, investors offering a significant leveragecan not only help opening many doors, but also save months long, non-directional, efforts.

Investment Sizes and Timing

Not only the funding raised in small chunks gives opportunity to competitors to aggressively enter the market killing the startup, but also sufficiently sized investment trenches at right times is very critical to ensure that founding team spends most of its time in growing the business than in raising money; sizing and timing of the fund raising is critical for its survival and success.

Stock Options to Employees

When ownership is distributed to employees, they behave fundamentally different and contribute multi-fold the growth and survival of the startup. Therefore an opportunity to offer stock options to employees has contributed to Startup success (Preston, 2001)

Location

Location of the firm is a key determinant of success and business should be located close to its biggest competitors and/or to its most demanding customers - economic clusters. Being located in a cluster of companies with complementary or competitive skill-sets, it becomes easy to find required resources, support and infrastructure (Porter, 2001; Pe'er and Keil, 2013). Thereby the location plays a key role in startup survival and success.

Culture

The impact of culture to have passion, not fear and celebrating failures are very important to foster entrepreneurship. Also, Rosenbusch et al. (2011) found that impact of innovation on firm-performance is way stronger in cultures characterized by collectivism (as in many Asian countries) than in individualistic cultures (as in U.S.). A higher level of individualism restricts team-effort and social interactions (internal and external),which areimportant for the success of innovation and impact thereof on the firm.

Others

Beyond the number of research literature reviewed, startups being one of the most talked about subject, a number of articles and blogs are available talking about startups. With the diversity

of startup environment and ever evolving eco-system, knowledge through such articles can't be ignored. A number of other factors have been proposed in different articles.

- Age of Entrepreneur - starting out late in life, when family liabilities have raised and / or energy levels of the entrepreneurs are not at same levels as younger counterparts; thereby reducing the chances of startup success against the competition.
- A good and comprehensive pre-startup planning (product, market and competitive study) before commencement of business as full time, helps increase the chances for startup survival. In addition, this planning gives the founder(s) an opportunity to build enough cash reserves for himself / family to sustain by the time revenues or funding comes for the startup; thereby increasing the chances of startup survival.
- It is very important to stay focused and sustain to ensured continued efforts for the success of the startup. Maximum number of early startup closures are because of entrepreneur who either leaves the business to go back to employment or moves to the new idea. Capacity to stay afloat for an extended period of time - due to financial reasons or family support reasons is one of the key reasons for entrepreneurs quitting the business.
- Role of right mentors for the growth of a startup is very critical, especially in case of a very highly tech founding team. Deepaliet. al (2017) described the role of mentors for successful entrepreneurship and how an entrepreneur can select the best mentor to assist the right path for growth.
- Ability of internationalization in the light of size of home market, can contribute for scaling and thus long term success of a startup.
- Startups should ensure cost optimized operations for its survival, thereby it is important for them to run operations in cost effective way, instead of a flamboyant approach.
- Ensuring a balanced scaling across dimensions (customer, product, team, financials, business model) offers higher chances of a startup to survive longer (Startup Genome Report, 2012; Kumbhat & Sushil, 2017).

Conclusions

In conclusion, this paper proposes a comprehensive yet practical list of ingredients to startup success, across startup's value proposition, team and other environmental aspects. Such a deep and practical understanding of success factors and evaluation of a startup against such factors can result into a formal startup rating system. Not only such information can be utilized for better entrepreneurial education but also be used to evaluate a particular investment opportunity by an investor.

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Corporate Governance in the Changing Scenario

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Abstract

Corporate governance is in existence since 1961 but hardly being implemented effectively in practice. However, with the failure of giant business firms such as Enron, Tyco International, Adelphia, peregrine systems and WorldCom, the economy of several nations was shaken. This forced them to consider the implementation of good governance practices as one of the primitive responsibility for the real economic development of their nation. In fact, it has been realized that in the absence of efficient governance mechanism, no nation in the world can think about its progress.

Considering these facts, the objective of this paper is to describe the reforms initiated in respect of corporate governance practices since inception and further to highlight the conceptual framework regarding corporate governance prevalent in India. For this purpose, existing literature has been reviewed and analyzed to present a generic framework of some important aspects of corporate governance practices in India.

Keywords: Corporate Governance, Disclosure, Transparency

Introduction

The existence of corporate governance practices came into effect since 1961, though hardly be implemented effectively in practice. The economy of several nations was shaken with the failure of leading business firms such as Enron, Tyco International, Adelphia, peregrine systems and WorldCom; due to this US investors had lost their confidence in US security market. This forced them to consider the implementation of good governance practices as one of the essential priority of their economic development.

As a result, major reforms were initiated by various stock exchanges and regulatory bodies across different countries like Sarbanes-Oxley act (2002) of US. These reforms were implemented to create a system of regulations and controls and to regain investor's confidence in the corporate firms. In fact, it has been realized that in the absence of efficient governance mechanism no nation in the world can survive in the dynamic environment.

Considering these distressing situation, nations throughout the globe started thinking towards the system of transparency and disclosures as well as the importance for the compliance with good governance norms on the part of firms. India was lagging behind in this respect. However with the introduction of liberalization and globalization in the beginning of 1990's, when liberalization took place and corporate governance established an international context. Due to globalization,

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India started moving from a closed economy towards an open and welcoming economy. In the open economy, the number of listed firms was increased proportionately and foreign investors were attracted towards the tremendous opportunities for investment. India also started realizing the need for corporate governance with the Harshad Mehta's securities scam, the scam was uncovered in April 1992, involving a large number of banks and resulting huge changes in the stock market for the first time since the initiation of reforms in 1991.

The paramount concern of the government is to save the economy from such a precarious situation. Therefore, the corporate governance movement was started with the establishment of Securities and Exchange Board of India (SEBI) in1992.The main objective of SEBI is to supervise and standardize stock trading, but it gradually formed many corporate governance rules and regulations. The next major change is the formation of Confederation of Indian Industry (CII) in 1996, with the intent to develop the set of laws for Indian companies related to corporate governance. Then two committees Kumar Mangalam Birla and Narayan Murthy under Securities and Exchange Board of India started laying the groundwork for formalizing the best practices on corporate governance. Based on suggestions from these committees, Clause 49 was made a part of the listing contract for the companies listed on the Indian stock exchange. However, corporate scandals like Enron, Satyam and WorldCom etc. forced the clause 49 to be reframed to overcome the problems that caused these companies to collapse and shatter the economies of the respective countries. (N.Sanan and S.Yadav,2011).

Since, in 2004 India became the second most attractive FDI location among manufacturing investors (Kearney, A. C., 2004). But the foreign direct investments in India are more skill intensive rather than capital intensive. Due to the competition in the global market there is a need to attract talent from a worldwide employment pool. It became a motivating factor for Indian firms to improve their regulations and practices related to corporate governance and to adopt international corporate governance standards. (Khanna & Palepu, 2001). Indian companies have to be more focused on transparency and Shareholders value maximization to attract more foreign direct investments.(R. Ramakrishna, 2007).

Considering these facts, the objective of this paper is to give an overview of the corporate governance reforms initiated since inception and to develop a conceptual framework regarding corporate governance practices prevalent in India. Existing literature has been reviewed in this context to develop a generic frame work of corporate governance practices.

For this purpose, the paper has been divided into six sections. The first section is related to the introduction, specifying the emergence of corporate governance practices and the framework of the paper. Second is the literature review. Third section describes the methodology opted for the paper. The fourth section presents a brief overview of corporate governance initiatives initiated by Indian government, This section also explains the recommendations of various committees formed by the government such as Narayan Murthy committee, Naresh Chandra committee, Kumar Managalam Birla committee, J.J. IRANI committee etc. to initiate good governance practices in India.

Further the fifth sectionof this paper discusses the importance and use of some parameters of corporate governance, for instance, CEO compensation, board meetings, whistle blower policy, disclosure and transparency, code of conduct, independent director, composition of board and board committees; these parameters havelaid an impact on the performance of a firm.

Lastly, sixth section is related to the concluding observations. It enumerates some recommendations that need to be addressed to save the economy from corporate scandals.

LITERATURE REVIEW

This section of the paper summarizes existing researches conducted at national and international level related to corporate governance .

Some of the researchers have supported to the corporate governance practices, have an impact on the firm survival and growth while others have found no such relationship. Eccles et al. (2012)have explained that sustainability is to be embedded in the organizational culture and the governance structure needs to be tailored accordingly. They emphasized on the significance of two key elements of Corporate Governance, i.e. Board of Directors (BOD) and Executive Compensation, to ensure sustainable growth of the organization. Gompers et al. (2003) have studied governance index for 1500 large US firms, and find the risk-adjusted returns of firms with strong governance are 8.5% higher than firms with poor governance. L. Som (2006) states that corporate governance of property protection and safe modes of ownership registration affects the firm's capital mobilization. The author suggests that for receiving the funds from the market, the firm has to be consistent in disclosing its details. Further, for effectively handling the capital received, by the company they should have well-planned incentive schemes, proper resource allocation and resource distribution. Zahra and Pearce (1989); Jonnergard et al. 1995 and Maasen 1998) have analyzed that corporate governance has an indirect effect on the company performance, they have studied the integrative models encompassing board involvement, different theoretical perspectives and various board attributes such as board size, board composition and number of non-executive directors on the board .

S. Claessens and B. Yurtoglu,(2013) explain the affect of corporate governance on the performance of firm as well as on the nation. They have stated that corporate governance help the firms in accessing outside finance and generating wealth by better distribution of resources and good management practices. As a result there Capital cost is decreased and the firms are valued at higher cost; on the one hand this directs them towards the growth path by reducing unemployment and on the other hand corporate governance can be associated to reduce financial crises at national or at country level, Since these crises, have devastating effects on economy of any country. The authors enumerate, if corporate governance practices are followed properly, this creates better rapport with the stakeholders.

On the contrary,Laing and Weir (1999) have found the basic reasons for no such positive relationship between non-executive directors and firm performance are part-time employment of non-executive directors, lack of highly technical issues and non availability of sufficient information while taking key decisions. Further, Mukherjee and Ghosh (2004) portray dismal scenario and have concluded that corporate governance in India is still in a young and developing stage and the investment decisions of Indian investors are volatile. Bhasin (2010), Brahmbhatt et al, (2012), Bhardwaj and Rao (2014) have analyzed that there is still a loop hole present between applying governance norms and required governance norms for the effective and efficient system, there exists a haziness in correlation between compliance of corporate governance parameters and net profit. However, authors have recommended an additional range of existing mandatory needs of Clause 49. Sharma et al (2009) describes that all the firms listed on renowned stock exchanges of India have completed agreement with mandatory corporate governance practices as per the clause 49 SEBI listing agreement(Securities and Exchange Board of India), however, with reference to non mandatory needs and the extent of corporate responsibility disclosure, the outcome were quite disappointing. Patel and Patel (2012) mention that there exist the inter-company differences in the adherence to corporate governance norms, as different parameters are given importance by companies as per their level of Market capitalization and working laws pertaining to the industry they are belonging in.

In light of the reforms undertaken in the recent years in respect of corporate governance and evidences from various empirical researches exhibit that some of the parameters like board directors, executive compensation, board size and number of non-executive directors on the board have been used considerably to study the impact of corporate governance on firm performance in India. However, there is no such study has been found which has summarized the reforms undertaken by government and presented a brief overview of corporate governance since its inception. Therefore, objective of this paper is to present a summary of corporate governance practices, norms and recommendations in India since inception. The paper also develop a conceptual framework in this respect.

RESEARCH METHODOLOGY

This paper discusses the conceptual framework of corporate governance practices since inception. For this purpose existing literature review with the national and international experience has been summarized.

Some of the important component of corporate governance practices referred as key components and their implications has been described in this paper. Similarly, the recommendations of some of the important committees has also been enumerated in this paper.

CORPORATE GOVERNANCE IN INDIA

This part of the study describes the corporate governance practices in India. Corporate governance has became an important issue for India as problems related to investor protection, lack of capital formation in the economy, unemployment, intense competition from multinationals firms are of paramount concern and can never be resolved without good corporate governance practices .In order to solve these problems and to keep the Indian economy on growth track it is important that good corporate governance practices matching the international best practices must be enforced. These are not only necessary for the survival and growth of the firms but these are also vital for the economic development of a nation. There are many instances revealing that the business could not survive in the market without following ethical standards be is national or international market.

The foundation for the corporate governance in India is led with the established of Securities and exchange board of India (SEBI) In 1992 with the objective to supervise and standardize stock trading, In fact, gradually SEBI had started forming rules and regulations for the corporate governance to enhance transparency. The major initiative was the formation of confederation of Indian Industries in 1998 which gave desi rable corporate governance code to be followed by firms in the country. Further many committees were constituted from time to time in order to cope with the changing scenario which came up with recommendations that can improve the corporate governance practices in India. In this regard, Kumar Managalam Birla Committee which was formed in 1999 that suggested various mandatory and non- mandatory recommendations applicable for all the listed companies having paid- up capital of over Rs 3 core or net worth of over Rs 25 core at any given point of time. Adoption of these recommendations was ultimately the responsibility of board of directors. Department of corporate affairs formed a task force on corporate excellence under the chairmanship of Dr.Sanjeev Reddy in 2000.

Till Then corporate governance was not given due importance, Whereas economies crisis in US due to corporate failures alarmed the Indian government to look back at their preparedness from such collapses. For strengthening the corporate governance practices in India, Naresh Chandra committee was formed in 2002 and also the RBI consultative group of directors of banks / financial institutions came up with the recommendations applicable on all public as well

as private sector banks, Afterwards to examine the role of companies in responding to price – sensitive information circulated in market,. The Narayana Murthy committee in 2003 studied seven parameters – ease of implementation, transparency, verification, importance, accountability, enforcement and fairness. In this direction, J.J. Irani committee also gave recommendations in the year 2005 and addressed the on issues such as management and board governance, related party transactions, minority interest, investor education and protection, access to capital, accounts and audit, mergers and acquisitions, investigations under the companies act and restructuring and liquidation.

Keeping in view the recommendations of these committees clause 49 was introduced on 1 January 2006. In addition, ICSI gave recommendations to further strengthen the corporate governance framework. Recently, in 2012 Adigodrej committee recommended "guiding principles of corporate governance which also stand incorporated in companies' act 2013. Finally, all these efforts led to the enforcement of companies'act 2013 in place of companies' act 1956. To incorporate the necessary changes in clause 49 SEBI issued guidelines in 2014. In order to ensure the transparency in the working of firms, SEBI introduced listing obligations and disclosures requirement(LODR) in 2015. (NFCG report – 2017).

KEY COMPONENTS OF CORPORATE GOVERNANCE PROCTICES

The vast phenomena of Corporate governance has been studied in many ways. This section of the paper focuses on some of the important aspects that influences the firm performance, few of them listed below are.

Composition of board

Boards of directors, consisting executive and non- executive directors are elected by the stockholders of the firm, they are entrusted with the responsibility to manage the company. The former is directly responsible for business functions such as finance and marketing andthe day-to-day affairs of the company. (Weirand Laing, 2001). They are full time employees of the company and have clearly defined roles and responsibilities. However, the later one i.e. executive directors are not in a strong position to monitor or discipline the CEO (Daily and Dalton, 1993). It is therefore important to have a mechanism in monitoring the actions of the CEO and executive directors and to ensure that they pursue shareholder interest.

On the other hand, for effective management of a company experts and experienced persons with requisite knowledge and specialized skills are also required. Non- executive directors also known as senior most directors or outside directors of the company, treated as an experts and selected from within the country or outside the country. Dare (1993) argues that non-executive directors are effective monitors when ask firm's strategy related questions. They are able to provide independent judgment when dealing with the executive directors in areas such as pay awards, executive director appointments and dismissals.

While some research studies have questioned the presence of non- executive directors on the board and have stated that they do-not contribute effectively towards the performance of the firm. Two recent US studies Yermack 1996, Bhagat and Black, 1999have found a negative relationship between the proportion of outside directors and corporate performance. Chaganti et.al. (1985) also found that there is no difference in the proportion of non-executive directors on the boards of failed and non-failed firms. Likewise,(Vageas and Theodorou 1998; Laing and Weir, 1999) also do not find a relationship between the proportion of non-executive directors and corporate performance.

Board meetings

In board meetings, governing body of the company meets for conducting the affairs of a company or discuss the issues related to the functioning of the firm. Generally, such meetings are presided by the chairperson and all the members including the chairperson are liable for the decisions taken at such meetings. The details of the decisions taken in such meetings are recorded and made available to others as minutes of the meetings.

Vafeas (1999) has noted that one of factor that effect how boards operate is the frequency of board meetings. From meetings Board members get a chance to come together and discuss and exchange the ideas on monitoring strategies. More frequent the meetings, closer the supervision and control over managers, the more relevant would be the advisory role. All these will lead to a positive impact on the performance (proactive boards). P.D. Andres (2008) found a positive relationship between the number of board meetings and bank performance. The results supported that bank board meeting plays a role that is more proactive than reactive. (1999);

But on the other hand, Berthelot, S., et.al (2012) found that the frequencies of board meetings are negatively related to the firm's net book value or income.

On the other hand, frequent meetings might also be a result of board's reaction to poor performance (reactive boards).

Code of conduct

In general, code of conduct is the guidelines for ethical behavior are applicable to individuals as well as organizations. As individuals and organizations are an integral part of the society so they must also act in the desired manner and must not harm the society by their wrong deeds. In this respect, Kumar Managalam Birla committee (1999) has suggested that - It should be obligatory for the Board of a company to lay down the code of conduct for all Board members and senior management of a company. This code of conduct shall be posted on the website of the company.

The Narayanamurthy committee (2003) also recommended that board of the companies should be made responsible for adoption of formal code of conduct in the companies. Clause 49 states that all board members and senior management personnel shall affirm compliance with the code on an annual basis. The annual report of the company shall contain a declaration to this effect signed off by the CEO and COO.

Whereas companies' act 2013 provides for the code of conduct for independent directors under schedule IV of the act .This schedule ensure adherence to various standards required to be comply by the independent directors. Focusing on detailed guidelines and deliberations for the professional conduct, role, functions and duties, code emphasizes on the appointment, re-appointment process, and removal and resignation procedure. Under this code separate meetings of independent directors and their evaluation mechanism has a scope to strengthen and bring transparency in the board affair.

Disclosure and transparency

In the today's globalized world when economies are integrated with each other. It is indeed the need of the hour to have such disclosure to ensure the transparent working of the corporates. Because transparency and fair dealings are two main pillars that aid the firms in achieving their goals. Therefore several committees have tried to cover different aspects by that corporate frauds can be minimized and an environment of investor trust and confidence could be created.

Clause 49 also emphasis for the disclosure of related party transactions, accounting treatment, risk management, proceeds from public issue, right issues, preferential issues, as well as disclosure of remuneration of directors, management and shareholders.

Naresh Chandra committee (2002) has also recommended that management should provide a clear description in plain English for each and every material contingent liability and its risks; which should be accompanied by the auditor's clearly worded comments on the management's view .So that investors and shareholders could obtain a clear view of a company's contingent liabilities as these may be significant risk factors that could adversely affect the company's future financial condition and results of operations. Further,

Narayanamurthy committee (2003) emphasized on improving the quality of financial disclosure, including those related to third party transactions and proceeds from IPO.

J.J. Irani committee (2005) has given parameters such as disclosure of routine information on periodic basis, standards for accounting, audit and non- financial disclosure and also about a regime of stringent penalties both civil and criminal for default on disclosure.

In the same way Listing obligations and disclosure requirements (LODR) Regulations, 2015 provides principles of governing disclosures and obligations such as; rights of shareholders, timely information, equitable treatment, role of stakeholders in corporate governance, disclosure and transparency and responsibilities of the board of directors. In addition, it is emphasized that disclosure of information having bearing on performance / operations of listed entity and /or price sensitive information and disclosure of material facts should be prepared by companies and that information should be placed before board of directors.

SEBI guidelines 2014 also cover some more aspects such as disclosure of information of the resignation of directors in annual report by the companies and that information to be placed before board of directors in order to aid corporate excellence and sustainability.

Whistle blower policy

Whistle blower policy empowers the employees of an organization to report misdeeds of the company. Only a policy document is not sufficient, the employees should be given adequate rights as well as protection so that they can fearlessly bring to light such deeds of the firms. Employees should be made aware of their rights in this regard. SEBI guidelines 2014, recommended a compulsory whistle blower mechanism in all firms.

Clause 49 states for establishing a mechanism for employees in a company to report the management concern about unethical behavior, actual or suspected fraud, violation of the company's code of conduct or ethical policies. This mechanism could also provide adequate safeguards against victimization of employees who avail it and it also provide for direct access to the Chairman of the Audit committee in exceptional cases. Once established, the existence of the mechanism may be appropriately communicated within the organization

Kumar Managalam Birla committee says that Companies shall take measures to ensure that this right of access is communicated to all employees through means of internal circulars, etc. The employment and other personnel policies of the company shall contain provisions protecting "whistle blowers" from unfair termination and other unfair prejudicial employment practices.

Companies shall annually affirm that they have not denied any personnel access to the audit committee of the company (in respect of matters involving alleged misconduct) and that they have provided protection to "whistle blowers" from unfair termination and other unfair or prejudicial employment practices. Such affirmation shall form a part of the Board report on Corporate Governance that is required to be prepared and submitted together with the annual report.

CEO compensation

A representative agency theory infers that generally goals adopted by a firm's management and the shareholders are generally not similar. As such, shareholders should attach their financial benefits to compensation paid to a firm's management. Once management behavior is unclear, compensation is a corporate governance mechanism to encourage management to run a firm in the interest of shareholders. This link will resolve an agency issue between management and shareholders and contribute to a firm's performance positively (Jensen and Murphy, 1990; Mehran, 1995)

Lerong He (2008)has analyzed studied that there are two types of CEO-compensation, i.e. These are incentive compensation and total compensation (overall pay level) incentive compensation is the variable part of CEO annual compensation which includes the sum total of bonus, long-term incentives awards, restricted stock awards and the stock option grants. While total fixed compensation includes base salary, annual bonus and incentive compensation. The author has applied the ordinary least square (OLS) regression with stratification method to estimate the compensation regression and reveals that Founder CEO is associated with smaller incentive compared to total compensation of the professionals CEOs because of larger job security and unique intrinsic characteristics distinct from professionals CEOs.

Firth et al. (2007) has studied a sample of 549 listed firms in China between 1998 and 2000. They find ownership and governance factors as determinants of cash pay and a link between cash compensation and firm performance. In the earlier related research, Firth et al (1999) have worked on the cash compensation in Hong Kong and have found that there is a little statistical correlation between pay and firm's stock market performance.

Bauer, R. et al (2008) have investigated the relationship between corporate governance and corporate performance in Japan. A unique governance index is used to rate the firm's corporate governance using six different categories. The relationship of each sub-index with stock price performance was investigated. It was revealed that remuneration has a significant impact on stock performance.

Board committee

For carrying out the diverse functions within a company various committees like audit committee, remuneration committee, shareholders/investor grievance committee, nomination committee, CSR and sustainable development committee etc. are formed within the organizations. It is mandatory for the companies to disclose the committees that they have formed for other stakeholders of the company such as,

Stakeholders' Relationship Committee stated by (J.J IRANI COMMITTEE) Companies having combined shareholder/deposit holder/ debenture holder base should be required to constitute a Stake Holders Relationship Committee to monitor the redressal of their grievances. The Committee should be chaired by a Non-Executive director.

Likewise, for the (Remuneration Committee) There should be an obligation on the Board of a public listed company, or any other company accepting deposits, is, to constitute a Remuneration Committee, comprising non-executive directors including at least one Independent Director in the case of a company where Independent directors have been prescribed as a part of substantive law. In such cases, Chairman of the Committee should be an independent director. Small companies are exempted from such a requirement.

The Remuneration Committee will determine the company's policy as well as specific remuneration packages for its managing/executive directors/senior management. The Chairman or in his

absence at least one member of the Remuneration Committee should be present in the General Meeting to answer shareholders' queries. (Also recommended by Shri Adi Godrej committee (2012); SEBI guidelines (2014.)

Independent director

The term independent director is defined as a non-executive director of the company who:

i. Apart from receiving director remuneration, does not have any material pecuniary relationships or transactions with the company, Its promoters, senior management, holding company, subsidiaries and associated companies;

ii. Is not related to promoters or management at the board level or at one level below the board;

iii. has not been an executive of the company in the immediately preceding three financial years;

iv. Is not a partner or an executive of the statutory audit firm or the internal audit firm that is associated with the company. He has not been a partner or an executive of any such firm for the last three years. This will also apply to legal firm(s) and consulting firm(s) that have a material association with the entity.

v. is not a supplier, service provider or customer of the company This should include lessor-lessee type relationships also; and

vi. Is not a substantial shareholder of the company, i.e. owning two percent or more of the block of voting shares

The considerations /remuneration paid to an independent director shall be the same as those applied to a non-executive director.(Kumar Mangalam Birla Committee)

In addition, J.J IRANI COMMITTEE States that presence of Independent directors may vary depending on the size and type of company. There cannot be a single prescription For all the companies. Therefore number of Independent directors may be prescribed through rules for different categories of companies. A minimum of one third of the total number of directors as independent directors should be adequate for a company having significant public interest, irrespective of whether the Chairman is executive or non-executive, independent or not.

CONCLUSION

To enhance the transparency and consistency in the economy, the formation of proper corporate structure and governance practices are essential. This paper describes the need of corporate governance practices and the framework related to that. In order to minimize the corporate failures, more inflow of foreign investments and to develop a system of disclosures where investors are not hesitated to invest their money, it is eminent to have an improved and transparent system of corporate governance.

It has found from the literature review that whistle blowing policy, code of conduct are the least studied variables, the study has explored them in detail and highlighted their impact on the of the firm's performance. It is also observed that government has made continuous efforts to introduce the transparent disclosure practices in order to overcome the problem of corporate frauds and loss of investor trust in the security market. However, there are some loopholes that need to be reframed to assure safe investment environment. The paper brings fore that only making reforms are not sufficient, their implementation must be enforced. The non-compliance of these should result in stringent penalties and punishments.

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Digital Transformation-Bank Aggregator System

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Abstract

In the era of e-governance, losing users trust and public disclosure of sensitive data are considered as criminal offence by organizations. Digital transformation includes various strategies to manage resources digitally, enhance business agility, operational efficiency and customer satisfaction. In that line, organisations need to focus on new age technology with the potential to transform the present ecosystem. This paper focuses on the digital transformation approach to sensitive data management that's especially useful for banks and organisations using Bank Aggregator system (BAS). The system under study encompasses a wide range of technologies like pubic key encryption (Pretty Good Privacy (PGP)), Web DAV, SQLite, SFTP and CRON jobs to provide secure common integrated platform for implementing various schemes using the middleware software for various organisations and banks. BAS uses pushing and pulling mechanism for the payment request and response files between banks and organisations securely. The system would be very useful to implement DBT schemes to the subsidiaries under various e-governance programs.

Keywords: PKI, Public key encryption, PGP, WebDAV, SFTP, SSH Public Key Authentication, Bank Aggregator system.

Introduction

Bank Aggregator System (BAS) is an innovative initiative system using public key encryption mechanism[1] of NIC State Centre Bhubaneswar to provide secure common integrated platform to implement various government schemes using the middleware software for various departments of Government of ODISHA and various banks. The BAS is middleware software which pushes the payment Request files to corresponding bank SFTP server and pulls the payment response files from bank SFTP server Securely with the help of SSH Public Key Authentication and PGP[3]. It takes care of all the following necessary invisible functions to provide secure platform to the departments and banks.

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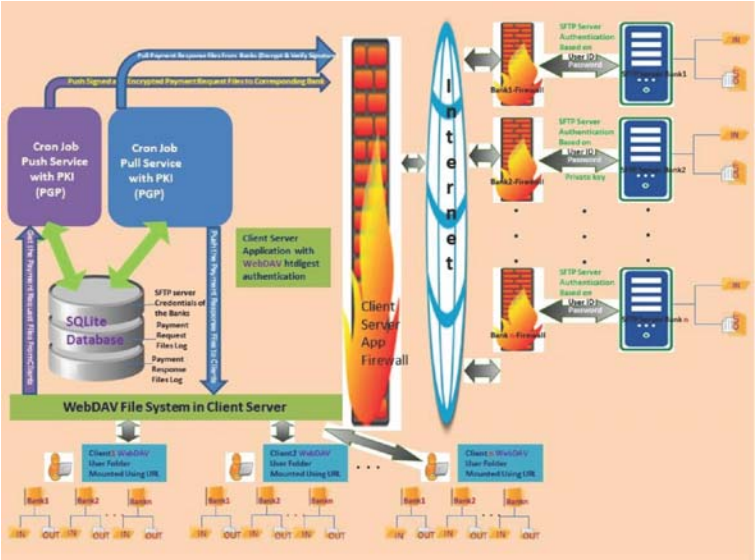


Figure 1: Bank Aggregator System

i. Providing network file system (predefined structure created) suitable for the internet to the departments with credentials so that the departments can mount the network file system with their credentials in their server and place the request payment files in the bank folder.

   Sign the payment request file generated by the department in the assigned network file system in regular intervals with Senders private key

ii. Encrypt the signed payment request file with bank public key.

iii. Upload the signed encrypted payment request file to the respective bank SFTP server

iv. Keep the immutable backup of payment request file and cipher of payment request file in the department file system

v. Maintain the log for payment request files sent to bank SFTP server

vi. Download the payment response files from the bank SFTP server in regular intervals

vii. Decrypt the payment Response file with Receivers private key

viii. Verify the decrypted response file signature with Respective bank public key

ix. Push the verified payment response file to the respective user department network file system so that the department can update the response status of the payments in their system

x. Keep the immutable backup of payment response file and cipher of payment response file in the department file system

xi. Maintain the log for payment response files received from bank SFTP server

Objective

The main objective of the System is to enable our departments to deliver a vast range of well secured digital services using public key encryption mechanism (well-known security protocol) that will greatly benefit for DBT schemes.

Transformation Strategies

Various technologies are used to implement the system like pubic key encryption (Pretty Good Privacy (PGP)), WebDAV, SQLite[4], SFTP, SSH Public Key Authentication and CRON jobs. The detailed description is given below:

Provide network filesystem (client WebDAV user Folder as per Figure1) to the departments using **WebDAV**[5]. Web Distributed Authoring and Versioning (**WebDAV**) Network file system suitable for the internet is an extension of the Hypertext Transfer Protocol (HTTP) that allows clients to perform remote Web content authoring operations. The **WebDAV** protocol provides a framework for users to create, change and move documents on a server, typically a web server or web share. WebDAV server Allows easy setup for administrators and ease of use for users. Departments can mount the **WebDAV** network file system with their provided credentials in their server. Departments can place the payment request files and get the payment response files in the mounted folder. The WebDAV credentials will be authenticated with the server using htdigest [6] authentication mechanism or LDAP authentication mechanism.

Banks only provide SFTP access. SFTP is a secure method for transferring files between two computers. SFTP can stand for either SSH File Transfer Protocol or Secure File Transfer Protocol. SFTP is primarily used for uploading or downloading files between a local computer and a remote one. SFTP file transfers can be carried out between a client and a server. Banks will open the SSH (Secure Shell) port for specific IP (client server) they should not open SSH globally as this could lead to a security breach. Some banks use two factor authentication password authentication and Public key authentication. It can be achieved by activating both password authentication and public key authentication, i.e. SSH Public key authentication.

We need secure mechanism to push the payment Request files generated in the department user directory (WebDAV directory) to the respective bank SFTP servers and pull the payment Response files generated by banks in their SFTP server response folder. So we have to extend our application with security functions such as signing, encryption, decryption and verification of the data to protect sensitive data from unauthorised access. To achieve this we adopted Public-key asymmetric encryption systems, such as Pretty Good Privacy (PGP) which are popular for transmitting the data via the internet. They are extremely secure and relatively simple to use. Public key encryption (PGP) provides more than just encryption it provides authentication and integrity. Authentication ensures that the messages are derived from the original originator claimed. Integrity allows the user to be certain that a file has not been altered either by error or intent during transmission. Integrity useful for guaranteeing our files was not altered in transit. We should make our public key available to all the banks, but we have to keep our private key private (only we can see it). Our Public key is used by the recipient, i.e. banks to verify the signature of the signed payment request file and to encrypt the payment response files before generating in their SFTP response folder. Our Private Key is used for creating digital signatures for the payment request file of the department and decrypting the payment response file which will be encrypted by the bank with our public key. We can use open source version produced by the Free Software Foundation called the GNU Privacy Guard (GPG)[7] to complete the security functions such as generating key pair (public key ring and private key ring/secrete key ring), importing the public key rings of all the banks, signing, encryption, decryption and verification of the data. The detailed description of sender using PGP mechanism is given below:

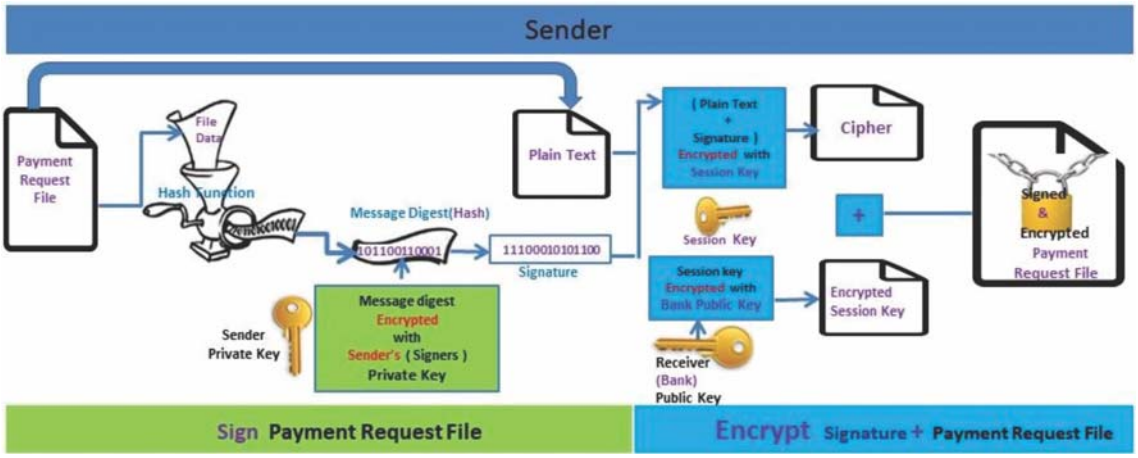


Figure 2: Sender Payment Request File with PGP

- Generate Hash (Message Digest) for Payment Request File
- Encrypt the Message Digest using Senders Private Key that will generate Signature for the payment Request File
- Encrypt the payment Request file and Signature with session key(generated randomly) that will generate *cipher*
- Encrypt the Session key with Respective Bank Public Key that will generate *Encrypted Session Key*.
- Combine the cipher and encrypted session key which is signed and encrypted payment request file that can be uploaded to bank SFTP server.

The Detailed description of receiver using PGP mechanism is given below:

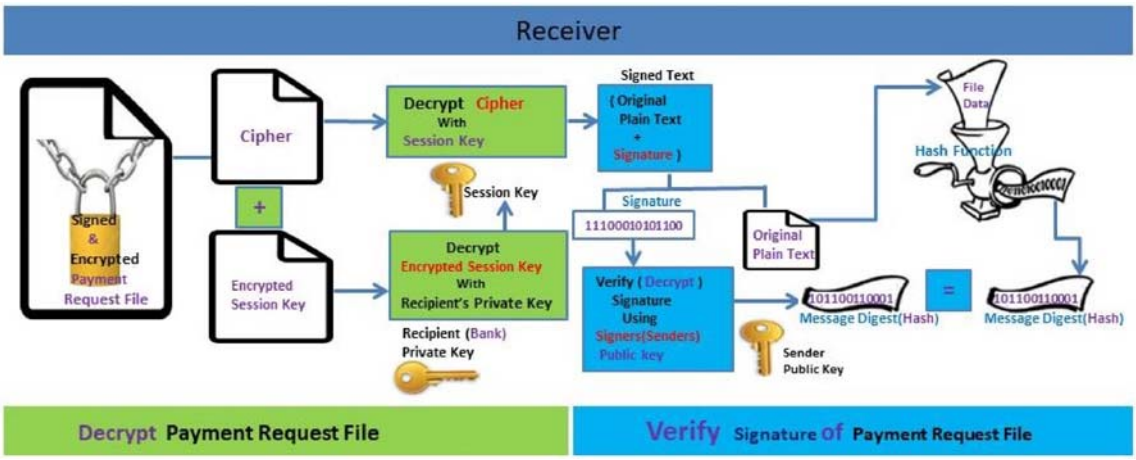


Figure 3: Receiver Payment Request File with PGP

- Receiver (bank) will decrypt the Encrypted session key with his private key that will generate session key.
- Decrypt the cipher with session key that will generate signed Payment Request File(signature + payment Request file)

- Generate Hash (Message Digest) for Payment Request File
- Verify(Decrypt) Signature using Signers(Senders) Public Key that will
- Generate Message Digest
- Verify both Message Digests is nothing but verifying the signature

The Detailed description of CRON jobs (PUSH & PULL services) is given below:

CRONJOB1: Push Service:

"*PReqFile*" Represents the Payment Request File

"*PResFile*" Represents the Payment Request File

"*Pk*" Represents the Public Key

"*Prk*" Represents the Private Key

"*bnk*" Represents the bank

Fetch the *PReq Files*from Web DAV root directory

For each *PReqFil*ei do

Ifvalid*PReqFile*then

Fetch SFTP credentials, SFTP Server details&bank public key of theRespective *bnk*from SQLite database based on *PReqFile*;

Sign the *PReqFile*with senders*Prk*;

Encrypt Signed *PReqFile*with recipient's (*bnk*) Pk;

Upload *PReqFile*to bank SFTP server IN folder;

Append to Log table;

Backup the *PReqFile*and cipher files in department user folder;

Change the backup file as immutable;

End if

End for

CRONJOB Pull Service:

For each *bnk*i do

Fetch SFTP credentials, SFTP Server details& bank public key of the Respective *bnk* from SQLite database;

Check and download Response files from the bnk*;*

If valid*PResFile* then

Decrypt *PResFile* with Receivers *Prk;*

Verify Signature with Senders *Pk;*

Push *PResFil*eto users response location based on *PResFil*ename;

Delete *PResFile*form *bnk*SFTP server;

Append to Log table;

Backup the *PResFile*in department user folder;

Change the backup file as immutable;

End if

End for

Conclusions

This system helps the beneficiaries and government which is progressively looking for modern cashless environment to implement DBT using Electronic payment. It provides secure common integrated platform to implement various government schemes using the middleware software.

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Developing Core Competence, Competitiveness and Institutional Excellence in Uncertain & Challenging Economic Environment: A conceptual model for Indian Higher Education Institutions

Mohammad Akhtar[1] and Sushil[2]

Abstract

Educational institution need to improve over a period of time in terms of quality, productivity, cost and effectiveness of teaching and learning. Higher educational Institution (HEI) such as universities, technical and professional institutions imparting graduate and post graduate courses need to create core competence for competitive advantage and educational excellence. Due to uncertainty in business and economic environment throughout the world including India, HEI need to adopt flexibility to overcome employment uncertainties. Factors such as strategy formulation after market analysis, and its execution, technology absorption particularly IT, innovation and creativity, quality management such as accreditation and ranking, collaborations and JV nationally and internationally with industry and other educational institution, resources, infrastructure, and capability development will create core competence which will result into competitive advantage and educational excellence in long term. A conceptual model has been developed in this paper which will provide guidelines for further empirical research and case studies.

Keywords: Higher Educational Institutions, Flexibility, Quality Management.

Introduction

The general purpose of school is to transfer knowledge and prepare young people to participate in society. As per Wikipedia, Education is the process of facilitating learning, or the acquisition of knowledge, skills, values, beliefs, and habits. The word “education” is derived from the Latin *educâtiô* (“A breeding, a bringing up, a rearing”). “The purpose of education has always been to everyone, in essence, the same - to give the young the things they need in order to develop in an orderly, sequential way into members of society (Dewey, 1934). The function of education is to teach one to think intensively and to think critically. Intelligence plus character- that is the goal of true education (Martin Luther King Jr., 1948). The main purpose of the American school is to provide for the fullest possible development of each learner for living morally, creatively, and productively in a democratic society (ASCD, 1957). Achieving inclusive and quality education for all reaffirms the belief that education is one of the most powerful and proven vehicles for sustainable development (UNDP, Sustainable goal 4).

India has one of the largest network of universities and higher education institutions (HEI) including 753 universities and 41435 colleges. But the spending by the government of India is low in comparison to international standard. India spent 3.71% of the total expenditure in 2016-

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17 and has budget provision 0.47% of GDP in 2017-18. The enrolment ratio in HEI is 24% for the 18-23 age group including distance education (Economic Times, Feb 6, 2017). The enrollment at PG courses 9.71% and Research 0.77%. About 5.47% of UG and 24.57% of PG students are in university departments and national institutes. Out of 14.38 lakh teachers in HEI, only 10.54 % in universities. During 2014-15, only 27.8% of total PhD awarded were from science stream (UGC Report 2015-16).

Further, PhD are being looked as formality by educationists rather than looking it as a true research. Most of the researches are theoretical and do not find practical use and patents are negligible. The number of patents and technology transfer even by national institutes like IITs are very low in comparison to international universities. None of Indian universities and national institute find place in top 150 ranking in QS World University Rankings 2017.

The HEI particularly public universities & institution have come up in last 30-50 years. They are still functioning in traditional way of teaching and award of degrees. However few technical and professional institutions like IIT, IIM, NITIE, IIS etc. have made achievement in terms of quality teaching undergraduate and post graduate but still lack in research, design and engineering, patent and technology transfer for commercial use.

Educational institution over time need to improve in terms of quality, productivity, cost and effectiveness of teaching and learning. Higher educational institution (HEI) such as universities, technical and professional institutions imparting graduate and post graduate courses need to create core competence and competitive advantage to survive and serve better. Due to uncertain and turbulent economic environment in India and world over, HEI need to adopt flexibility to overcome employment uncertainties. Strategy formulation matching market needs, strategy execution, technology absorption particularly IT, innovation and creativity, quality management such as accreditation and ranking, collaborations and joint venture with national and internationaleducational institutionsand industry,developing resources, infrastructure, capability and skills will create core competence which in long term will result into HEI competitive advantage.

Status of Higher Education in India

There were only 20 Universities and 500 Colleges in the country with 2.1 lakhs students in higher education at the time of Independence of India in 1947.The increase in the formal system of higher education is 42 times in the Degree awarding Universities, 83 times in the Colleges and 136 times in the students enrolment(UGC Report 2015-16).

Spending on education as a share of the central government's total budgeted expenditure is falling for last three years. Education got 3.71% of the total expenditure in 2016-17. Education budget as a share of the GDP is 0.47% in 2017-18. In higher education (HE), the situation is much worse, with an enrolment ratio of just 24% for the 18-23 age group including distance education students (Economic Times, Feb 6, 2017). As on 31.03.2016, the number of Universities had gone up to 753 universities including central, state, private universities and institutes and 41,435 colleges in the Higher Education sector. The total enrolment in all courses and levels in regular stream was 284.85 lakhs where 19.02% in science and 29% in professional faculties. The student enrolment are UG 86.33%, PG 9.71%, Research 0.77%. About 5.47% of UG students and 24.57% of PG are in university departments and national institutes. Out of 14.38 lakh teachers in universities and colleges, only 10.54 % in universities. During 2014-15 out of 27,327 total PhD awarded, only 7617 PhD degrees related to science faculty (UGC Report 2015-16).

Most of the central and state universities are full-fledged universities offering courses in discipline of arts & linguistics, social sciences, natural sciences, technical and professional such as engineering & technology, business management, medical sciences etc. while national institutes, deemed universities, private universities and private institutions offer mostly technical and professional courses.

The central and state universities came into existence 3-5 decades ago when education was state monopoly where institution were protected and fully funded by the state. This resulted into non-competitive environment and poor quality of teaching and research. Even after opening the HE to private sector, there is very little pressure on these institution as funding is guaranteed by the state irrespective of HEI performance.

As technical and professional courses provide better return, there is prolification of pvt. HEI with poor quality of teaching, and infrastructure after liberalization of HE. As a result quality of qualified students and their employability suffered. Students of late, have shown dis-interest in taking admission into such sub-standard technical and professional colleges. In last 5 years few hundred private institutions have been shut down and this year 111 will be closed (AICTE Report). With introduction of quality accreditation by NAAC and NBA few years ago and ranking by NIRF since 2016 for all HEI including both state and pvt. has created some sense of quality consciousness but much more need to be done.

In view of the prevailing situation, there is need to re-look at education policy funding and quality of HEI more particularly the public higher institutions. The funding and pay & allowances need to be rationalisedbased on some select parameters such as accreditation and ranking. This will incentivisequality improvement and excellence.

The global economy continues to grow slower, widening inequalities, and with increasing educated youths, enough job opportunities are not being created. Education should meet the market demand in terms of knowledge, skills and values and aspiration of stakeholders (employers, students, funding agencies and government and social needs). Hence urgent need is being felt to focus on creating core competence for both public and private owned HEI which will create sustained competitive advantage over time.

Theoretical background

Core competence is a harmonized combination of multiple resources and skills that distinguish a firm in the marketplace (Prahalad and Hamel, 1991). It should fulfill three criteria such as to provide significant customer benefit, difficult to imitate by competitors and provides potential access to a wide variety of markets. Competitive advantage is the attribute that allows an organization to outperform its competitors viz. low-cost power source, highly skilled labor, geographic location, high entry barriers, and access to new technology (Porter, 1985).The ability of companies and industries to produce goods and services that meet needs locally and internationally, and generate relatively higher factor employment and income levels on a sustained basis (Momaya, 2014). Institutional core competence create sustainable competitive advantage that enables businesses to survive against competition and achieve industry leadership for decades and generations.

The major challenges being faced by higher education today are decreasing quality of education which is due to inadequate models of teaching process evaluation, inadequate application of existing quality control mechanism, favorisation of general education, devaluation of liberal model of education, plethora of information and fragmentation of knowledge, commercialisation of scientific projects (Gajiæ, 2010). The focus of all activities should be the needs of the student being major stakeholder. The challenges create favorable environment for transformation of higher

education institutions form faculty-centered into market-driven organizations and they put pressure on the existing institutions. As students today look for program quality, better service and value for money, all stakeholders should cooperate in creation and delivery of high quality service of higher education institutions.From literature, following factors that may contribute to core competence, competitiveness and performance improvement.

Strategy Formulation& Execution:

Strategic planning need to be accepted that can provide direction and facilitate progress. In the highly competitive world of higher education, universities must find ways to differentiate themselves and have individualised core mission. As universities have value systems guided by principles of long-term investment in educating people and creating and disseminating knowledge, strategic plan that is strongly linked to academic innovation rather than simply financial sustainability will have a better chance of finding support within the university. The institutional head directs to future desired state, support and commitment of academic community from the start of any strategic initiative is vital. Long-term as well as short-term strategic plans should be in place and strategic initiatives to be implemented to fulfill the strategic objectives set forth in the plans.

Resources, Infra-structure and Capability development:

The HEI including public and private lack in faculty, infrastructure of classrooms, labs, seminar hall, library, canteen, student hostel, teachers residential housing, ICT infrastructure and systems, skills and competency of faculties etc. This results into poor quality of teaching, knowledge transfer and personality building which affects the employability of graduates.

Most of the institution still follow traditional style of class room teaching, evaluation based on rote learning, outdated programs and syllabuses not in sync with market needs, teacher's salary and promotion not based on performance, lack of performance based incentive and encouragement for teaching and research. The quality of research and publication is poor. The number of quality PhD produced, research presentation in international conferences and publication in international journals and award of patent is very low. The aspects highlighted above need major focus for improvement as the resources, infrastructure and technology and capabilitiescreate institutional core competence and competitiveness.

Flexibility Adoption

Technological revolution, globalization and turbulence in business environment is developing a new competitive landscape. To manage the strategic discontinuities in this new competitive landscape, to build and maintain competitive advantage, requires an organization to adopt flexibility to succeed in the 21st century. To develop strategic flexibility and competitive advantage, requires strategic leadership, building dynamic core competences, developing human capital, effectively using new manufacturing and information technologies, employing valuable strategies and implementing new horizontal organization structures and learning and innovative culture. Thus, the new competitive landscape will require new types of organization and leaders for survival and global market leadership.

Universities serve the industry graduates with desired skill. To remain competitive, universities need to adopt flexibilities so as to meet the changing competitive business requirements.The strategic, organisational, operational and Information system flexibilities may be adopted for creating core competence and competitiveness.A balanced between change and continuity should be strived (Sushil, 2005). The public institutions need to adopt more flexibilities as they have lessor flexibility compared to private institutions.

Creativity and Innovation in Education

Change that creates a new dimension of performance is innovation (Drucker, 1986). An Innovation is a new idea, which may be a recombination of old ideas, a scheme that challenges the present order, a formula, or a unique approach which is perceived as new by the individuals involved (Zaltman et al. 1973; Rogers 1982). A culture of innovation and creativity requires organizations to break down functional barriers (Krishnamurthy 2011).Indeed, innovation looks different at varying levels of the organization, but continuous improvement must happen at all level of the organization. When a teacher discovers a different way of explaining theory of relativity, the result is better understanding the concept by the student. This is innovation at ground level - increased efficiency.

The higher education institutions today are facing continually to the increasingly dynamic, complex and uncertain environment which is due to demographic changes, global economy, the hyper-competition or knowledge-based competition (Daft and Lewin 1993). (Prasad). What is considered excellent today will only be considered as adequate tomorrow, there is a continual improvement loop, feeding back the learning from the results achieved and using creativity and innovation to drive increased value for all the stakeholders (EFQM).

Most of the institutions still stick to the traditional way of classroom teaching and research which poses challenges in terms of quality and meritocracy (Jayaram, 2011). With the sudden growth of higher education system, especially in the private domain, the question of innovationand creativity has been lost. (Prasad). There are significant opportunities for improvement on several fronts e.g. teaching and effective learning, research and development, design and engineering for product and technology, patent and commercialization of innovation, consulting, and specialised courses and value added services.

ICT adoption

The rapid development and growth of communications technologies have opened up new possibilities for information retrieval and analysis, and communication, research and collaboration at a distance. The information and communication technology (ICT) changed the way people were taught andIts ultimate promise is to bring new methods of teaching, learning and interaction. e-learning will become an even greater focus for universities in the future. It will increase the participation of students who were unable to attend university due to their location, health or other priorities, university facilities will still play a role (OECD, 2006). This combination of demand, costs, application of content and new technologies is opening the door to emerging competitors and new organizations that will compete directly with traditional universities and with each other for students and learners. (8)

However, only a few Institutions have adopted this technology and that too, only for certificate courses. There is a lack of recognition by the industry and HEIs to recognise e-learning courses and degrees. The government should recognize such an important aspect of education (GIFT, Prasad, 2013). There is urgent need of ICT application in course delivery through smart class rooms, online courses and recorded videos of lectures, examination and evaluation, degree award, university administration, online payment of fees, entrance examination, library etc. Educational ERP similar to commercial ERP e.g. SAP, Oracle EBS, MS Dynamics, covering all aspects of university management should be developed and implemented in all HEIs to improve efficiency and performance.

Quality Management

Quality is readiness for use (Juran, 1982), as value-added (Shannon, 1997), as constant, never-ending improvement (Foster, 2001). In marketing terms, consumer's satisfaction (Juran, 1988) or as adaptation to the requirements (Crosby, 1984). The quality is connected to three different causally determined values: purpose, processes and people. King Taylor, 1992). Quality of the higher education is a dynamic category based on the aspiration for constant improvement of all processes and their outcomes. The initiatives to evaluate higher education service quality is a result of dynamic changes in the environment of higher education (Martensen, et al., 2000): significantly higher level of needs and requirements by students and labor market, decreased public financing and increased competition. The three major drivers of education quality are customer requirements, need for organizational excellence and efficiency and responsibility toward stakeholders (Peter and Waterman, 1986).The employability and program quality were found to be key motives for students' choice of certain institution while location of the institutionis the least important (Helena &Mirna, 2012).

Further, educationists in India have started seeing research as just a formality to do PhD, rather than looking it as a true research. Most of the students find nothing extraordinary in their research. Patents won or doctoral programmes available are much small in number. It should be of grave concern that most of the institutions require our faculty to have PhDs, but there are no regulations for the organizations to stipulate proof of technological competency or teaching excellence in their new hires. Although, plenty of people in India still believe that IIIT& IIM are the ultimate place to success; none of the IITs & IIMs have featured (in top 150) in the QS World University Rankings 2017.

Internal quality assessment coupled with external qualitative assessment viz. NAAC and NBA accreditation, and NIRF ranking will help in improvement of quality, performance and competitiveness.

Collaboration and Joint Venture

Increased cross-border higher education has also meant increased competition among universities to attract both foreign and domestic students due to pressures of international comparison, quality labels, rankings and consumer choice. The increasing frequency of partnership and recognition agreements has also increased international pressure and competition (OECD, 2006).

Public and private institutions should form collaboration and joint ventures with other national and international institutions and industry to improve its quality label and ranking, core competence and competitiveness.

Internationalisation & Globalisation

In recent years, cross-border higher education has grown significantly and is expected to continue. This growth has been stimulated by a growing interest and demand for students to gain international experience. Internationalisation of higher education, where students travel abroad to study, or study in their home country through courses franchised from abroad (OECD, 2006), is leading to greater competition to attract more overseas students. As students are selecting a future place of study on the basis of the school, the programmes offered and its geographical location, improving the quality of programmes and teaching is naturally becoming a priority for universities to gain a competitive edge (OECD, 2011).

Under globalization, the competitiveness is critical to organizational sustainability. Global economic competitiveness rests on the knowledge and skill set of workforce (Brown et al., 2008). The HEIs to be responsive to those skills which constitute work-preparednessand the way forward

is through internationalization of higher education. They must stay abreast of the developments in academics, research and recruitment in other countries, and collaborate internationally. Those students with international education, even in a small measure, enjoy more employability in the global job market (EAIE, 2012) due to a variety of factors viz. exposure to multi-cultural environment and higher awareness of global trade, finance and industry operations. The benefits of international exposure in education and practical experience go beyond students. The higher education institutions also benefit in terms of more revenue generation, cross-fertilization of academic and research intellectual knowledge and stronger brand standing (Powar, 2012).

Incubation and Entrepreneurship

Innovation and entrepreneurship have become the prime drivers of economic growth. The establishment of technology business incubators to nurture nascent ventures by providing focused counselling and facilitation services together with smart workspace and shared office facilities. The new business incubator is an innovative system that provides a variety of support systems to entrepreneurs to accelerate new company development, speed the commercialization of technology, and contribute to economic growth.

India must tap the potential of innovation and patent by encouraging innovation, obtaining patent and technology transfer for commercial use. HEIs should aligns with the government's stated priority of creating a vibrant innovation ecosystem in the country and enhances the creation of intellectual property. To promote partnership with new technology entrepreneurs and start-up companies, IIT Delhi has started technology business incubator with Foundation For Innovation And Technology Transfer(FITT). It willallow individual and start-up units to develop product/services, leveraging on technologies having homology in the Institute to incubate. It will promote, celebrate and reward innovations and advancements. Would also help in filing patent.

Knowledge Management

Knowledge management (KM) is a systematic process by which knowledge needed for an organization to succeed is created, captured, shared and leveraged. According to Davenport and Hansen (1999), KM is concerned with the exploitation and development of the knowledge assets of an organization with a view to furthering the organization's objectives. For educational institutions KM is defined as: The organized and systematic process of generating and disseminating information, and selecting, distilling, and deploying explicit and tacit knowledge to create unique value that can be used to strengthen teaching-learning environment.

The application of 'invisible' assets, innovation, leadership and competencies, or knowledge as the basis for competitive viability (Prahalad and Hamel (1990). Spender (1996) noted that an organization's knowledge and its ability to generate new knowledge is the key to achieve competitive advantage. employee know-how and reputation are perceived as the resources that make the most important contribution to business success (Hall, 1992). Zack (1999) postulated that competitive advantage arises due to the strategic use of resources and capabilities, of which knowledge is believed to be the most significant. Knowledge management infrastructure, knowledge quality, knowledge management systems properties, organization, task and general environment create sustainable competitive advantage (Leila et al., 2005).

The educational institutions create new knowledge, import it from diverse sources, and apply in a range of different environments (Tranfield et al., 2004). Characteristics of knowledge relevant to educational institutions include facts, opinions, ideas, theories, principles, models, experiences, values, contextual information, faculties and staff insights, and intuitions. KM is an integral process component of any institution's structure and process. Knowledge management improves an institution's capacity to acquire, share and use knowledge in ways that improve its survival

and success. The knowledge that resides in our institutions, the intellectual capital, is the sum of their human capital, structural capital and relationship capital. KM in educational institutions get support from teaching-learning environment, research activities, technology based knowledge and knowledge based networking.

Leadership and Culture:

The leadership provide strategic direction and plays important role in managing and promoting organisation culture. The beliefs, ideologies, principles and values of an organization form its culture. The organisation culture decides employee behavior, competition at work place, and give employees a sense of direction and environment for innovation and creativity. In other words, it can support creation of core competence and competitiveness.

Effective strategic leadership practices can help firms enhance performance while competing in turbulent and unpredictable environments of 21st century's global economy. Strategic leadership practices can become a source of competitive advantage and in turn contribute to achieving strategic performance improvement.

Institutional culture is a crucial aspect for facilitating sharing, learning, and creating knowledge and innovation. An open institutional culture need to be created with suitable incentives which can promote institutional knowledge and innovation by integrating individual skills and experiences.

Change Management

The dynamic business environment due to globalization,technology, evolving customer behaviorhave created disruptive change in 21st century which is the new normal across all industries and organisationsmust constantly adaptto such changes. It is roughly estimated that around 30 per cent of change management initiatives achieve lasting results.Continuous change or change readiness reflects new understanding that change is new the rule, not the exception. All organizations must change, constantly, in order to succeed.Change should be treated as a necessary organizational culture that embraces change. As changes are frequent and continuous, leaders need to focus on developing the culture of change itself.Hence the continuous change management is imperative for all organisations in this 21st century to survive and flourish.

Government Policies & Regulation:

There is grave failures in policy making in the field of higher education in India. The root cause of the problem is India's excessive bureaucraticcontrol in higher education. The other factors are large number of regulatory bodies, financing, red tapism, lack of sustaining regulation, and lack of accountability and incentive. The main hindrance to innovation in HEI is government policies and regulation and lack of culture for innovation(Prasad, 2014).

Based on literature, a conceptual model (Fig 1) is presented which need to be further validated by empirical and case studies to find the contributory effect of factors and its linkages in developing core competence and competitiveness of Indian higher educational institutions.

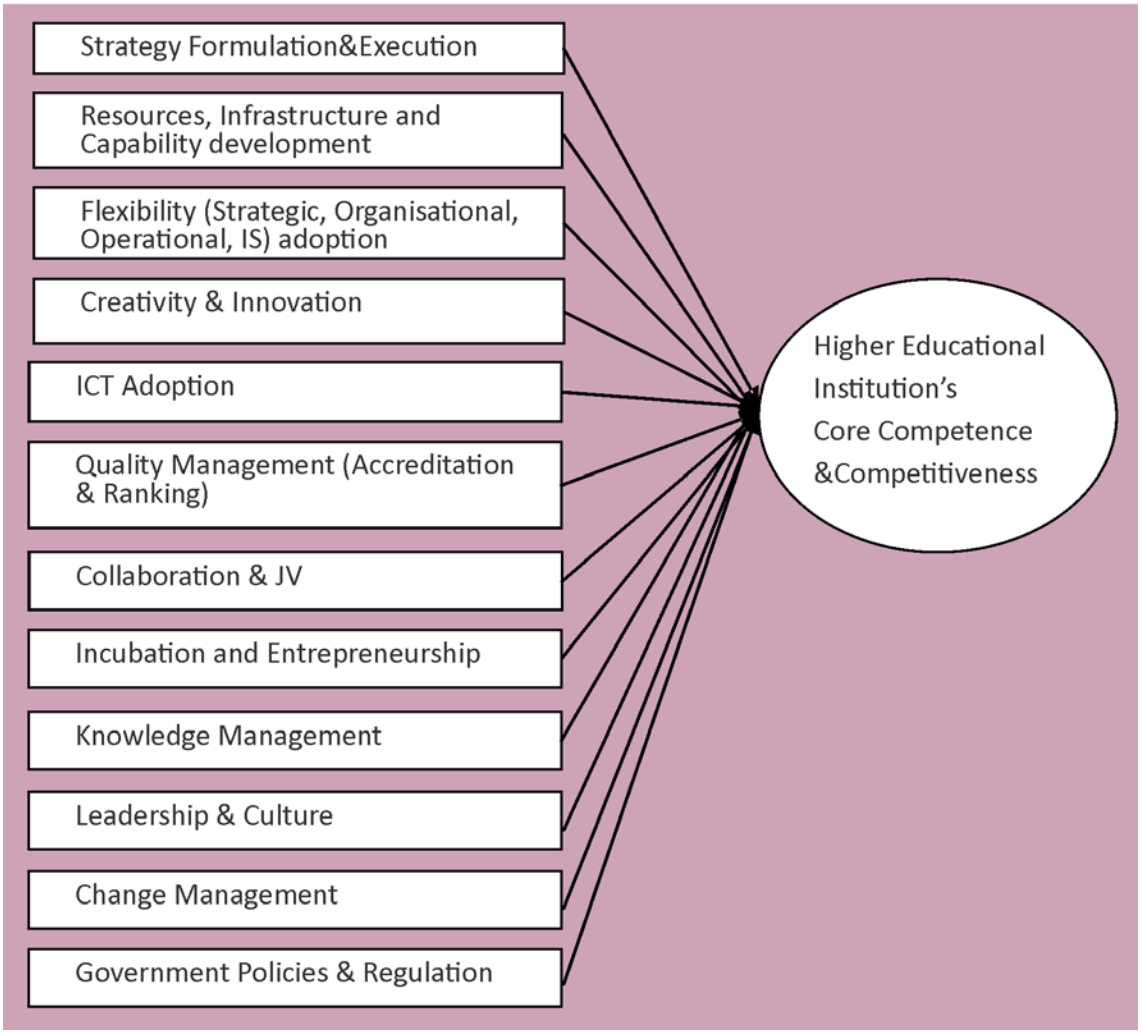


Figure 1: Conceptual model of HEI Core Competence and Competitiveness

Summary and Conclusion

The higher educational institution have grown over last seventy years in India but grown much faster in last twenty years both public and private. After liberalisation privates institutions have multiplied particularly in technical and professional education. The older and traditional universities have not been able to keep pace with time and environmental changes and still teaching in traditional style. The quality of teaching and learning, research and development is bigger challenges in most of the HEIs including public and private with few exceptions. None of the IITs & IIMs have featured in top 150 rank in the QS World University Rankings 2017. Number of patents and its commercialization is negligible. Quality of research paper and book publication is not satisfactory.

Technological revolution, globalization and turbulence in business environment is developing a new competitive landscape and is new norm for 21st century. The HEIs need to remain competitive to meet the market and institutional demand for supply of knowledgeable and competent

workforce. This require HEIs to develop core competence, competitiveness and performance excellence in order to improve the quality of teaching and learning and carry world-class research and innovation. Factors contribute to development of core competence, competitiveness and performance excellence of HeIs are; strategy formulation based on market analysis and customer needs and its execution, resources, infrastructure and capability development, flexibility such as strategic, organisational, operational, and IS flexibility adoption to manage uncertainties in economy, creativity and innovation in teaching and learning, executive development, research & development, and consulting, ICT adoption in teaching, research and educational management, quality management accreditation and ranking, collaboration and Joint ventures with national and international corporations and HEIs, incubation and entrepreneurship to create technological innovation and commercialization, knowledge management application, change management for effective implementation of strategic initiatives and reforms, leadership for strategic direction and creation of culture of quality, innovation and excellence and facilitation by the government through policies and regulation for educational management. Major changes required are in strategic intent, processes, systems, structure and culture and environment. The proposed conceptual model incorporating above factors is based on literature. There is scope for further research to validate empirically and through case studies to understand the effect of factors and its linkages in driving core competence and competitiveness of Indian higher educational institutions.

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Linking Forgiveness and Satisfaction with Life in Employees: An Empirical Study

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Abstract

Over the past two decades, several studies have pointed out the importance of job satisfaction, work-life balance, and work-life enrichment in promoting overall satisfaction at work but now researchers of organizational studies are focusing on satisfaction with life in order to meet the interests and diverse needs of the employees to ensure their global satisfaction. At the workplace, experiencing transgressions have become unpreventable when people want to restore relationships or devastating thoughts and emotions arising from psychological injury at the workplace, forgiveness is the way of attaining that restoration. This study extended forgiveness research by investigating the impact of forgiveness on satisfaction with life in employees working in Indian power sector in Uttarakhand, India. Data were collected through a cross-sectional self-administered survey-based research design, using standardized measurement instrument from the sample which consisted of 223 employees. In order to identify and validate the structure of factors, exploratory factor analysis, and confirmatory factor analysis were applied. Further, hierarchical regression analysis was used to investigate the influence of forgiveness on satisfaction with life.The results show that the dimensions of forgiveness have the significant influence the satisfaction with life. The study established the importance of forgiveness at the workplace and its effects on satisfaction with life in employees.

Keywords: Employees, forgiveness, power sector, satisfaction with life.

Introduction

From the past 15 years, studies on forgiveness have been increased intensely which covered its characteristics and correlates in the psychological research (Strelan, 2007). With the emergence of positive organizational psychology, the researchers have started focussing on the construct of forgiveness in the workplace (Lucus*et al.,* 2017). Undoubtedly, forgiveness is a positive trait which ensures adaptability of an individual in the society and is contributing to good health and quality of life (Macaskill, 2012; Tuck & Anderson, 2014; Griffin *et al.,* 2015). Despite the fact that organizations depend upon the employees to perform tasks precisely and to achieve the goals effectively and efficiently. Forgiveness helps to create a harmonious work culture where creativity and taking risks by employees is expected, encouraged, and acknowledged which is critical for organizational success by reaching the potential of employees (Grant, 2008).

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The definition of forgiveness given by Thompson *et al.* (2005) includes both interpersonal and intrapersonal forgiveness as the enclosing of a perceived transgression like responses of an individual to the person who is doing wrong (transgressor) and the wrong event itself (transgression), are changed from negative emotions to positive emotions. The source or object of a transgression may be oneself, another person or persons, or a situation (Thompson *et al.*, 2005). It has three dimensions namely, forgiveness of self (intrapersonal in nature), others (interpersonal), and situations. Forgiveness of self or intrapersonal forgiveness refers to the constructive attitudinal move in the emotions, beliefs, and activities associated with the individual's self after a self-perceived transgression or offense done by himself or herself has been occurred. Forgiveness of other refers to the human strength that is defined generally as a release of resentment, hatred, hostility, and even the thoughts of revenge against a wrongdoer (Thompson *et al.*, 2005). While, forgiveness of situation means letting of negative emotions which arise beyond anyone's control, and where source or object of transgression is neither self nor others. Thus, through forgiveness individuals synthesize their former assumptions of related transgression and frames a new understanding of the transgression, transgressor, and potentially, of themselves, other people, or the situation.

In the psychology and psychosocial studies, satisfaction with life continues to be a significant construct (Gilman & Huebner, 2003). The life satisfaction or satisfaction with life has been considered as the subjective expression of the quality of life and has been used as a dependent variable in many studies (Ballesteros *et al.,* 2001). Individuals make affective appraisals about life circumstances and situations based on the moment emotional reactions and memories of past satisfaction. Furthermore, they make cognitive appraisals about the quality of life-based on values and expectations (Prieto *et al.,* 2005). Life satisfaction is a construct which involves a judgmental process, through which people evaluate their quality of life on the ground of their self- developed a unique set of criteria related to their lives. (Shin *et al,* 1978; Pavot & Diener, 1993) which ranges from negative to positive. According to Diener*et al.* (1985 & 1999), life satisfaction refers to a desire of an individual to change the life, which includes satisfaction with past; future, and important other's views of one's life. It excludes the affection evaluation. Positive psychology embraces these vital constructs (like forgiveness, life satisfaction, optimism, hope, gratitude, happiness) which are studied in the positive organizational behavior and helps the employees to grow in their personal and professional life (Seligman, 2008). The purpose of this study is to investigate the influence of three dimensions of forgiveness namely, forgiveness of self (FS), forgiveness of others (FO), forgiveness of situations (FST) on satisfaction with life (SWL).

Literature Review and Hypothesis Development*Forgiveness and its dimensions (FS, FO, FST)* Self- forgivingness is the ability of an individual to let go of self-resentment with the compassion, love, and generosity for oneself with the acknowledgment that he/she is the object of wrongdoer (Thompson *et al.*, 2005; Hall & Fincham, 2005; Mullet *et al.*, 2005; Hill & Allemand, 2010). It is considered as the propensity to react to personal wrongdoings, transgressions, or shortcomings with benevolence and punitiveness for self (Maltby*et al.*, 2001) and is different from forgivingness of others (Ross *et al.*, 2007). It has been studied with personality traits like emotional stability, and conscientiousness (Ross *et al.*, 2004), cognitive flexibility (Thompson *et al.*, 2005), and many of positive health outcomes (Wilson *et al.*, 2008). Rangganadhan & Todorov (2010) highlighted that there is a negative relationship between shame-distress and self-forgiveness. The study led by McConnell *et al.* (2012) offered an insight that severity of offense positively impacted guilt and conciliatory behavior and there is a positive mediation of perceived forgiveness in the relationship of guilt and self-forgiveness. Wohl & McLaughlin (2014) has derived a model of FS on the basis of empirical and rational support, which is concentrated solely on

responsibility- behavioural change and revealed that those who have high levels of FS tend to have low negative affect, takes the things positively, more responsible and which facilitates in their behavioural change.

The second dimension of forgiveness is FO (forgiveness of others) and has been studied, as a human strength which is defined as the letting go or release of resentments, hatred, hostility, and even the thoughts of revenge against a wrongdoer (Kamat*et al.*, 2006). This encourages long-term physical and emotional well-being of people (Allemand*et al.*, 2007). The tendency to forgive others and situations were identified with ruminations on the transgression (Ysseldyk*et al.*, 2007), and a decrease in anger (Thompson *et al.*, 2005). It was also positively associated with psychological well-being (Brown, 2003; Karuse& Ellison, 2003), and enrichment of social support (Lawler- Row &Piferi, 2006). Interestingly, the propensity not to forgive bring down the coping ability of individuals increased tendency of depression, anxiety (Maltby*et al.*, 2001), and associated with poor social support (Maltby*et al.*, 2004). While the process behind this stays questionable. Few researchers like Roberts, 1995, and McCullough, 2000 argued that forgiveness of others encompasses the positive perspective of the transgressor, a modification in motivation, which is further incorporated by the removal of hesitation in moving towards the transgressor, and this boosts the interpersonal adjustment. The effects of forgiveness comprise greater learning, high creativity, and emotional stability (Menahem & Love, 2013). Lucas *et al.* (2017) highlighted that justice can both improve and obstruct forgiveness, depending on the thoughts the forgiveness of self and others related with distributive and procedural justice. The past studies support that people showed more forgiveness towards a wrongdoer when they think about justice for themselves or procedural justice for another individual, and they are low on forgiveness when they think about distributive justice for another person.

Thompson *et al.* (2005) have focused on the third dimension i.e. forgiveness of situations. This dimension represents that facet of forgiveness in which the source of observed transgression is neither identified as self nor as others (Thompson *et al.*, 2005). Many times people may condemn the situation itself, such as the situations leading to an illness or accident when a colleague is driving a car. Then, they are more likely to blame the situation like 'an unjust world' or 'fate' or what happened to 'life'. Such type of situations might be associated in a transgression conducted by self or other, an individual considering the consequences and implications of an accident is upset and may blame the colleague for not taking suitable precautions to prevent the accident, and also might think that 'the cruel world' has brought these bad circumstances which led to an accident. Individuals feel that the source behind such bad circumstances are reflected in their understanding such as 'the world is against me'; 'life is so unfair'; 'it was all due to fate', then they are likely to forgive the situations in the belief that neither they were wrong nor others, these were the situations which led to disagreements or transgression etc (Strelan, 2007).

Satisfaction with Life (SWL/LS)

Satisfaction with Life has been considered as individual's cognitive evaluation of different domains of life like, work, friends, finance, family, and society (Diener*et al.*, 1985; Diener, 2000; Diener& Ryan, 2009). Life satisfaction is an important construct in positive psychology (Gilman & Huebner, 2003) as measures of life satisfaction are profound to the intact range of functioning, and that is why considered as the indicators of well-being also. Further, it is a key indicator of happiness and emphasize on the identification and development of strengths of an individual, which is integral to the science of positive psychology (Veenhoven, 1988).

Creed *et al.* (2003) sated that those who have employment have high career decision making self- efficacy and life satisfaction reason being, they have more accessibility of benefits and less financial stress than unemployed or part time employed. Previous studies have also

demonstrated that goal importance, perceived goal attainment, and goal fulfilment are positively associated with both life satisfaction and positive affect (see Emmons 1986; Emmons & Diener 1986). Another similar findings have been reported by Hofer & Chasiotis (2003) with the sample of Zambian males, where implicit motives and self-attributed goals enhanced satisfaction with life.

Valle *et al.* (2006) investigated the influence of hope on life satisfaction and reported that hope significantly predicted life satisfaction. On the similar lines Sahin*et al.* (2012) also reported that hope significantly predicted SWB (subjective well-being). Another researchers (e.g. Steger *et al.* 2006; Halama & Dedova, 2007; Ho*et al.* 2010) revealed that presence of meaning is positively correlated with SWL. According to Chen & Kamibeppu (2010); Boonphadung (2013), factors like household environment, overall well-being, self- acceptance, life style indicators, and personal information were correlated with SWL.Actually, life satisfaction is the reflection of experiences that affected an individual in a positive way. Such an experiences have been able to motivate individuals to pursue and attain their goals. Optimism and hope are two emotions that influences the individual's way of living life. In both these emotions an individual is cognitively involved, and oriented to reach goals. Further, optimism is associated with higher satisfaction with life and whereas pessimism is positively correlated with the symptoms of depression. Past researches have offered an insight that self-esteem also positively influenced life satisfaction in individuals (Niharika&Kiran, 2014). In global perspective, satisfaction with life has been found to be enhanced by emotional intelligence (Zhao *et al.*, 2013), social support and less loneliness (Hombrados-Mendieta*et al.,* 2013), perceived autonomy support (Ratelle*et al.,* 2013), positively influenced by the employment (van der Meer, 2014), more increased by higher income (Carlsson*et al.,* 2014), also associated with attachment styles of people (Li & Fung, 2014), and relationship quality (Sharma &Garg, 2016).

Link between Forgiveness and SWL

Past studies have provided sufficient substantiation which established the link between dimensions of forgiveness and satisfaction with life. Studies exhibited that forgiveness influences the life satisfaction of individuals, those who have high levels of the tendency to forgive also have the high level of satisfaction with life (McCullough *et al.,* 2001; Hall & Fincham, 2005; Macaskill, 2012, Safaria, 2014). The results of research conducted by Thompson *et al.* (2005) also revealed that the levels of FS and SWL have a significant positive relationship. A follow-up study also highlighted that there is a positive association between self-forgiveness and ability to manage emotions (Hodgson & Wertheim, 2007). Individuals use self-forgiveness to protect their overall well-being from the toxic impact of devastating thoughts, and emotions arising from transgressions, like guilt, shame, and regret (Fisher & Exline, 2010; McConnell, 2015). Thus, the first hypothesis of this study is as below:

H_1: FS positively influences SWL.

Forgiveness of others has been found to have a positive association with life satisfaction, positive affect, and negative association with anger, anxiety, depression, hostility, and stress (Thompson *et al.*, 2005). A study of forgiveness and happiness in Indian private sector organizations highlighted that employees who are likely to forgive others are happier as by doing this, they turn their negative affect into the positive affect which leads to happiness and thus, life satisfaction (Sharma &Garg, 2016) Based on these past results, the second hypothesis of this study is as below:

H_2: FO positively influences SWL.

The FST (forgiveness of situation) has been studied conceptually more so there is very less number of empirical studies on this. One study conducted by Thompson *et al.* (2005) has empirically investigated the forgiveness of situations. The results were consistent with past findings on FS and FO, and supported that individuals with high levels of FST (forgiveness of situation) more satisfied with life and were less prone to anger, depression, and anxiety. Based on this, the third and fourth hypothesis was formed and hypothesized research model (figure 1) is as below:

H_3: FST positively influences SWL.

H_4: FGV positively influences SWL.

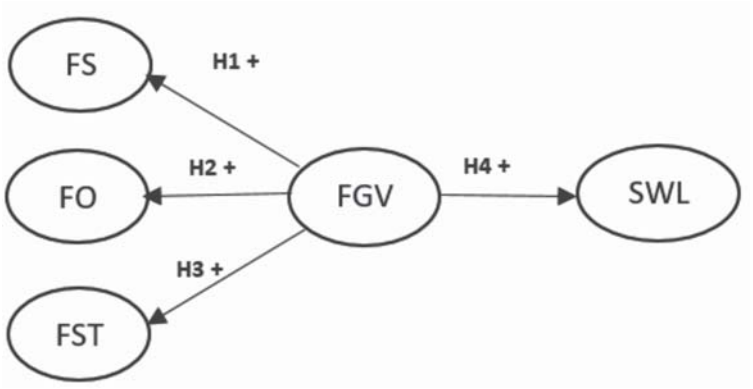


Figure 1: Hypothesized Research Model

Source: Author's own

Note: FS= Forgiveness of self, FO= Forgiveness of Others, FST= Forgiveness of Situations, FGV= Forgiveness, SWL= Satisfaction with Life.

Research Approach

Participants and Procedure for data collection-

To collect the data, the cross sectional self-administered survey was used with help of convenience sampling method. The respondents were from managers working in the Public sector, Uttarakhand, India. The questionnaire was distributed through the personal visits and training session to 240 participants but the final sample consists of 223 respondents for the study. Seventeen questionnaires were discarded because of incomplete and unengaged responses. Respondents were majorly males. Participants were working at junior, middle and senior level of management working at the different job titles, such as 'Assistant Engineer'; Associate Engineer', 'Chief General Manager', 'Senior Manager-Training & Development', 'Deputy General Manager', 'Associate Chief Engineer' and 'Deputy Executive Engineer'; Executive Engineer'. Table 1 presents the respondent's details.

At first, we discussed with the participants about the study, scale, and scoring. They were assured about the anonymity of their participation. The survey comprised three sections; first, includes demographic information, second part includes items on forgiveness; and the third section includes items on satisfaction with life.

Table1: Respondents details

Demographics (n=223)	Frequency (s)	Percentage (%)
Gender		
Male	200	89.9
Female	23	10.1
Age (in years)		
21-30	53	23.77
31-40	48	21.52
41-50	69	30.94
51-60	53	23.77
Education		
Diploma holders	11	4.93
Graduate	87	39.01
Post Graduate	121	54.26
Doctorate	4	1.79
Hierarchal Level		
Junior Level	86	38.57
Middle Level	48	21.52
Senior Level	89	39.91
Work Experience		
0-5 years	37	16.59
6-10 years	49	21.97
11-15 years	62	27.80
16-20 years	52	23.32
Above 20 years	23	10.31

Measures

Forgiveness Scale- Dispositional Heartland Forgiveness Scale developed and validated by Thompson *et al.* (2005) which presents that how you tend to forgive yourself, others, and situations when a negative circumstance occurs. It contains total 18 items (6 items on each dimension namely, FS, FO, and FST) on seven-point Likert- type format with responses extending from 1 = almost always false of me; 7=almost always true of me, with high scores depicting high levels of each type of forgiveness (Thompson *et al.*, 2005).

Satisfaction with Life-

The Satisfaction with Life Scale developed by Diener*et al.* (1985) has been taken. It is a 5-item measure designed to assess an individual's appraisal of satisfaction with his or her life. Participants respond using a 7-point Likert scale ranging from strongly disagree to strongly agree, with higher scores indicating higher satisfaction with life. The SWLS is the most widely-used measure of life satisfaction (Pavot & Diener, 2008).

Empirical Approach

The data were analyzed through the statistical software SPPS (23) and AMOS (23). To address the purpose of the study, as a convention after treating missing values and unengaged responses, skewness and normality of data were checked. After that Harman's single factor test was deployed to check whether the problem of common method bias exist or not. Various statistical techniques were deployed by the researchers namely, EFA, CFA to the check the validity of factor structure in the Indian context and multiple hierarchical regression with stepwise method was deployed to investigate the impact of dimensions of forgiveness on satisfaction with life. These are covered in detail in the analysis and result section.

Analysis and Results

Normality Test

Before proceeding with the further for applying various statistical tools, the data have undergone a normality and skewness check process by Explore option in the SPSS software. The obtained coefficients for normality (i.e., skewness and kurtosis) have indicated that forgiveness negatively skewed, whereas satisfaction with life was positively skewed. The coefficients were within +/-1 standard deviation of the mean, which approved that data is normally distributed (George &Mallery, 2001).

CMB assessment

As this study deployed self-reported measures, henceforth, it was imperative to check the existence of common method bias (CMB) in the sample data (Chang *et al.*, 2010). Therefore, on the recommendation of Podsakoff*et al.* (2003), CMB was tested using Harman's one-factor analysis in which the variables of interest were subjected to a un-rotated factor analysis. A single factor emerged that accounted for explaining only 34.43% of the variance. The single un-rotated factor solution has been set to be 50% or less than 50% to confirm the absence of common method bias in the data (Podsakoff, 2012) thus, it was within the limit.

Validity and Reliability of the Variables

First, EFA (exploratory factor analysis) was conducted to understand the factor structure of scales taken up in the study, and were subjected to Principal Component Analysis (PCA) with Kaiser's Varimax Rotation. Hair *et al.* (2003) recommended that a factor can be accepted if it has Eigenvalue greater than 1.00 and Cronbach's alpha more than 0.60. However, in the context of this study, all the measures were found to be reliable with Cronbach's alpha above 0.70, within the range recommended by Nunnally (1978) also. In this study, 4 factors were extracted up to eigenvalues greater than 1.00 and a Cronbach alpha value minimum 0.70. The table 2 exhibit the variables or dimensions meeting this criterion.

To test the convergent and discriminant validity of the scale, confirmatory factor analysis (CFA) has been deployed. However, the scale had already been validated by original authors (Diener*et al.,* 1985 & Thompson *et al.,* 2005). As per the recommendations of Joriskog & Sorbom (2001) and Hair *et al.* (2003), to ensure the factorial validity of structure, it imperative to form alternative models and a comparison should be made before following any model for further analysis. These alternative models are formed like one, two, three, (models depend on the number of factors under study) which are established by merging with the previous model. Accordingly, researchers of this study have developed 3 models for forgiveness and one model for SWL as there is no dimension in SWL and comparison of fit indices were done. The first model included FS only, second model FS and FO both, third model comprised of FS, FO, FST and a separate one factor model for SWL were analysed. The results of CFA are presented in the table 3.

Table 2: Factor Structure of Forgiveness

Variables	Cronbach's α / Eigen Value	Factor Loadings
Forgiveness of Self	0.899/1.93	
FS_1		0.767
FS_2		0.674
FS_3		0.727
FS_4		0.879
FS_5		0.933
FS_6		0.631
Forgiveness of Others	0.921/3.24	
FO_1		0.786
FO_2		0.802
FO_3		0.911
FO_4		0.971
FO_5		0.803
FO_6		0.637
Forgiveness of Situations	0.928/2.84	
FST_1		0.82
FST_2		0.758
FST_3		0.811
FST_4		0.859
FST_5		0.802
FST_6		0.911
Satisfaction with life	0.927/2.06	
SWL_1		0.728
SWL_2		0.853
SWL_3		0.908
SWL_4		0.878
SWL_5		0.866

Source: Authors own

Note: FS_1 to FS_6= items on the scale of forgiveness of self; FO_1 to FO_6= items on the scale of forgiveness of others; FST_1 to FST_6= items on the scale of forgiveness of situations; SWL_1 to SWL_5= items on the scale of Satisfaction with life.

Table 3: Results of CFA for Forgiveness and Satisfaction with life

S. N	Details	χ2	*df*	χ2/*df*	GFI	NFI	TLI	CFI	RMSEA
1.	One factor Model[a]	53.984	9	5.998	0.818	0.935	0.908	0.945	0.150
2.	Two factor Model[a1]	170.782	53	3.222	0.883	0.913	0.922	0.938	0.100
3.	Three factor Model[a2]	343.451	220	1.561	0.984	0.918	0.964	0.968	0.050
4.	One factor Model[b]	52.781	24	2.199	0.918	0.995	0.918	0.997	0.057

Note: χ2 =chi- square; df= degree of freedom; GFI= goodness of fit index, NFI= normed fit index, TLI=Tucker Lewis Index; CFI= comparative fit index; RMSEA= root mean square error of approximation; [a, a1, a2]= models for forgiveness (FS, FO, FST), [b]= one factor model for satisfaction with life

The important model fit indices, which are crucial in determining the strength of factor structure, are also examined. The χ^2/df value below 3 is considered appropriate and indicates an acceptable (Carmines and McIver, 1981). In some circumstances, it has been found that sometimes researchers do not consider the χ^2 index especially in the case when the sample size exceeds 200 and also when there is the other model fit indices such as Tucker-Lewis index (TLI), comparative fit index (CFI), Normed fit index (NFI) and root mean square error of approximation (RMSEA). It is important to note here that CFI, IFI and TLI values having a cut off score of above 0.90 and RMSEA below 0.06 are acceptable for good model fit (Hu &Bentler, 1999; Hair *et al.*, 2003; van Dierendonck, 2005) while GFI more than 0.90 indicates goodness of fit (Kang, 2006). Referring to the table 3, total three model structures are tested for forgiveness and compared using SPSS AMOS software.

The third model is a three -factor model for forgiveness (FS, FO, FST), which included all the dimensions. The results indicated in Table 3 reported that Model 3 (three factor model of forgiveness) confirmed a good fit to the observed covariance matrix χ^2 (df=220) 35.358, χ^2/df=1.561, GFI=0.984, NFI=.918, TLI=.964, CFI=.968 and RMSEA=.05. For satisfaction with life model 4 which included the one factor of SWL reported χ^2 (df=24)= 52.78, χ^2/df=2.199, GFI=0.918, NFI=.995, TLI=.918, CFI=.997, RMSEA=.057, while the others models of forgiveness do not meet the cut off range and were rejected for the study for further analysis due to poor model fit. As a result of confirmatory factor analysis, theoretically reinforced three-factor model of forgiveness and one factor model of SWL indicated the best acceptable fit indices and is retained in the study (Hu and Bentler, 1999).

To investigate the convergent validity in the sample, various scores such as mean, standard deviation, average variance extracted (AVE), maximum shared variance (MSV), average shared variance (ASV) and composite reliability (CR) are calculated (see Table 4). The findings indicate that the 18-items of forgiveness and 5 items scale of SWL construct are significantly loaded on their respective dimensions. The internal composite reliability also ranged from .905 to .932, which is a good sign of reliability. On the basis of significant loading and higher CR (composite reliability) signifies the convergent validity of the model (Anderson & Gerbing, 1988; Bagozzi & Yi, 1988).

The AVE for FS, FO, and FST was 0.673, 0.614, 0.695, 0.710, and for SWL was 0.710 while CR values of the forgiveness dimensions are 0.924, 0.905, 0.932 respectively, and for SWL is 0.927. The CR values greater than AVE are the indicator of the convergent validity of the construct. Also, as per the guidelines prescribed by Hair *et al.* (2010), convergent validity of a construct is established if it prevails that composite reliability (CR) of the construct is greater

than its average variance extracted (AVE). In this study, composite reliability is greater than average variance extracted for all the constructs as shown in Table 4 indicating the constructs to be convergent valid.

Variables	Mean (S.D.)	CR	AVE	MSV	ASV	FS	FO	FST	SWL
FS	4.90 (1.79)	0.924	0.673	0.194	0.079	**0.820**			
FO	3.11 (1.68)	0.905	0.614	0.279	0.101	0.367	**0.784**		
FST	3.11 (1.99)	0.932	0.695	0.279	0.107	0.441	0.528	**0.833**	
SWL	1.97 (0.94)	0.927	0.710	0.124	0.064	0.352**	0.254**	0.257**	**0.843**

Note: FST= Forgiveness of situations; FS= Forgiveness of Self; FO= Forgiveness of Others; SWL= satisfaction with Life; CR= Composite reliability, AVE= Average Variance Extracted; MSV= Maximum Shared Variance; ASV= Average Shared Variance; **Correlation is significant at the 0.01 level.

According to suggestion of Fornell&Lacker (1981), we assessed the discriminant validity of the latent constructs in terms of root of AVE. Compare the root of AVE with its corresponding correlation of coefficient of any two constructs, if the root of AVEs are greater which means the requirement of discriminant validity is satisfied. In table 4, the bold diagonal values represent the discriminant validity. It can also be investigated by comparing the maximum shared variance (MSV) and average shared variance (ASV) with average variance extracted (AVE). As prescribed, discriminant validity exists when the values of MSV and ASV are smaller than the values of AVE (Hair *et al.*, 2010). Referring to table 4, all the values have satisfied these above-mentioned conditions. Thus, discriminant validity of the four factors is again confirmed in the study. From the CFA results, it was quite evident that constructs are highly reliable and valid in the Indian context.

Regression Analysis

As correlational analysis only provides information on the direction of relationship between the variables and no information about causation or predictive behaviour of the variables could be determined using this technique; henceforth, we also conducted multiple regression analysis to analyse the relationships of the variables in terms of how one variable acts as a predictor of another variable (Cohen & Swedlik, 2002). Furthermore, multiple regression analysis was also used to analyze the role of the forgiveness dimensions as predictors of satisfaction with life, as well as the combined effect of the forgiveness dimensions on SWL. To test the hypothesis stepwise multiple hierarchal regression was followed.

Table 5 and 6 present the results of the same. In multiple hierarchical regression, stepwise method was used as this starts with zero predictions and then the strongest predictor is taken into account after that second strongest predictor is entered by SPSS itself and non-significant predictors are automatically taken off. The method followed for testing the influence which was in line with the study conducted by Banjre*et al.* (2015). So, to begin with first dependent variable was entered and all independent variables were entered together in stepwise method. As presented in 5, in model 1, when forgiveness of self was taken into consideration then it is found to be a most significant predictor (in comparison to other dimensions of forgiveness) of satisfaction with life (β=.425, t=7.161, p<.001) and as per adjusted R square it contributes to 12.1 % variance in SWL with R^2 change 0.180 in satisfaction with life. Thus, second strongest predictor is FST and it also positively influenced SWL as presented in the findings of Model 2, when

forgiveness of situations was also added [FS: (β=.363, t=6.429, p<.001) & FST: (β=.333, t=5.909, p<.001)] then it accounts for 28.3 % change with R^2 change 0.107 in satisfaction with life. It means FS and FST together contributed 28.3% variance in SWL but additional 10.7% is contributed by FST alone so the first and third hypothesis is also accepted.

However, in model 3, when these three independent variables namely, FO, FS, and FST were analyzed together to examine their predictability. It was found that model 3 is the strongest predictor of SWL as compared to model 1 and model 2. Reason being, all the dimensions of forgiveness taken together contributes to 41.2 % with R^2 change 0.127 so when FO contributed additional 12.7% variance in SWL in the model [FO: (β=.167, t=2.686, p<.001); FS: (β=.544, t=9.181, p<.001) & FST: (β=.441, t=7.082, p<.001)]. Thus, the fourth hypothesis that when dimensions of forgiveness are combined together, then their influence is strong and significant on satisfaction with life, was also accepted.

Table 5: Summary of Hierarchical Regression Analysis for variables predicting DV[a] (N= 223)

Variables	β	SEB	t
Model 1			
FS	.425**	.045	7.161
Model 2			
FS	.363**	.042	6.429
FST	.333**	.064	5.909
Model 3 (IV)[b]			
FS	.167**	.044	2.864
FST	.544**	.068	9.181
FO	.441**	.041	7.082

Note: a. Dependent Variable= satisfaction life (SWL), b. Independent variables (IV) = Forgiveness of self, forgiveness of others, forgiveness of situations, β = standardised Coefficients beta, SEB= Standardised error, t= value of t, **p<0.01, *p<0.05.

Table 6: Model Summary of DV[a]

Model	R Square	Adjusted R square	SEE	R square change
1[b]	.123	.121	5.342	.180**
2[c]	.288	.283	4.991	.107**
3[d]	.415	.412	4.534	.127**

Note: [a] = dependent variable: SWL (satisfaction with life); b. Predictors: FS, c. Predictors: FS, FST, d. FS, FST, FO, **p<0.01.

Discussion and Conclusion

The purpose of the study is to examine the influence of forgiveness on satisfaction with life. The findings revealed that in Indian context all the dimensions of forgiveness namely, self, others, situations significantly influenced the SWL, in which FS was the strongest predictor, and however FST and FO were the second and third strongest predictor respectively, for SWL in employees. The predictability of FS was greater than other dimensions reason being, those

who can forgiveness themselves, are able to forgive others and situations (Thompson *et al.*, 2005). The results of this study consistent with the findings of similar studies done on different samples by different authors (e.g. McCullough *et al.,* 2001; Hall &Fincham, 2005; Thomspson*et al*., 2005; Macaskill, 2012, Safaria, 2014).

Owing to the previous studies, which revealed that Indian people are high on collectivism as compared to the countries like the USA where there is typical individualistic culture (Radhakrishnan& Chan, 1997). Accordingly, we based the hypotheses of this study on the assumptions the sample was taken would be collectivist and which is in line with the previous study on cultural differences in well-being (Diener*et al.*, 1999; Kitayama& Markus, 2000). Actually, in collectivistic culture people have rich social networks and also look for support from others (Kim *et al.,* 1994; Triandis, 1995). In line with this, Kurzynski (1998) stressed that though there are other positive constructs, the substantial role played by forgiveness in the upkeep of healthy workplace relationships is notable and both the forgiver and forgiven are liberal to concentrate on the responsibilities at hand and the performance goals of the organization. Furthermore, relatively high the cost of unforgiveness, such as lower job satisfaction, lost productivity, decreased goal commitment, needless or uncontrollable stress that organizations need to address. Besides, emotional state is an internal factor, and personality is also the prime determinant of life satisfaction whereas in India, well-being is not only dependent on internal factors only , but also of external factors e.g. relationships with others, and harmony in interpersonal relationship (Diener*et al.,* 1995; 1999; Kwan *et al.,* 1997; Suh*et al.,* 1998) which is enhanced when employees let go of resentments or transgressions among them by forgiving and restoring the relationship instead of revenge taking behaviour (Aquino *et al.,* 2003, 2006; McCullough *et al.*, 2007; Tripp *et al.*, 2007). Thus, well-being judgments of people are partly influenced by the cultural norms and broader social context. Apparently, these norms further influence the specific criteria employed by the individual to evaluate their well- being (Suh 2000; Kitayama&Markus 2000; Uchida *et al.,* 2004; Koydemir*et al.* 2013).

Undoubtedly in India, satisfaction with life is influenced by a number of variables which in general varies from caste, good job, health, having patrimonial assets, family, and the like. These variables which are expected to contribute to life satisfaction in India. In modern times, there are a lot of changes in the demographics of workforce which has brought about changes in the role played by people in personal and professional life like dual-career couples, work-life balance changed to work-life enrichment (Modekurti-Mahato& Kumar, 2014). (StevanovicPedja, 2011) has also affected the outcomes of satisfaction with life. Now people are self-inspired and intrinsically-extrinsically motivated to achieve goals at workplace which is associated with getting benefits, leads to greater support to family and thus, life satisfaction.

Forgiveness has been considered as a virtue in almost all the major religions of the world like Hinduism, Buddhism, Islam, Christianity, and Judaism (Pargament& Rye, 1998; Marty, 1998; Dorff, 1998; McCullough & Worthington, 1999; Rye, *et al.*, 2000). But at the same time, it is the least understood at the workplace and most difficult to attain also. The past researchers supported that those who are high on religious commitment have high level of forgiveness (Ismail *et al.*, 2009). In India, there is multiculturalism and all the religions support forgiveness which leads to satisfaction with life ultimately.

To conclude, with the fast speed of change, increasing emotional distance between the people but there is a need to enhance the meaningfulness, as it makes good to include the art of forgiveness in the workplace as it contributes to life satisfaction of employees. Truly, it will help in increasing the intention to stay and retention of the valued employees facilitates greater creativity and innovation, enhances the spirit of entrepreneurialism and encourages better

performance of employees which ultimately, leads to better organizational performance and higher profitability.

Limitations and Directions for Future Research

First, limitation of the study is that we have deployed cross-sectional research design, further studies are recommended by using longitudinal research design. Secondly, the study is limited to the state of Uttarakhand, India, and covered the employee's point of view. Further studies may include employer's point of view to give more certain conclusions. Forgiveness is a personal act which is highly subjective. It involves the release of negative emotions like anger and resentments. It is, therefore, quite difficult to confirm that whether or not people have truly forgiven. With reference to the current environment, in which people are less forgiving and where our modern society and adopted norms seems to consider forgiveness as a withdrawal technique or as a sign of weakness.

Due to this turbulent competitive business environment, people are now giving more preference to pursue their career goals and satisfaction in life. It behooves scholars of organizational behavioral studies to extend their reach to such an arena that demonstrate the highest human potential through studying the relationship between forgiveness and satisfaction with life. Another point for future research is to support the results by triangulated findings by using in-depth interviews, observations and archival records. The future studies may investigate the impact of socio-demographic variables on life satisfaction or may study forgiveness as moderator or moderator variables. Of course, much additional research is required on these constructs in today's parlance.

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pp. 250-260

E-governance Policy of India: A Step Towards Sustainable Development Goals (SDGs)

Rakesh Gulati[1] and P. K. Suri[2]

Abstract

The adoption of the 2030 Agenda for Sustainable Development Goals (SDGs) in 2015 - addressing the social, economical and environment aspects by the General Assembly of United Nation - with people in the centre stage to eradicate poverty and prosperity for all on a safe planet, is an unprecedented endeavour for transformation of the world. The agenda includes 17 SDGs: No poverty, Zero hunger, Good health and well being, Quality education, Gender equality, Clean water and sanitation, Affordable and clean energy, Decent work and economic growth, Industry, innovation and infrastructure, Reduced inequality, Sustainable cities and communities, Responsible consumption and production, Climate action, Life below water, Life on land, Peace justice and strong institutions and Partnership for goals, which are further refined to 169 targets (UN, 2017). It seems to be a utopian task to achieve the goals of no poverty, health and education, safe drinking water, affordable and clean energy, etc. for all by the target year 2030. The challenge of achieving universal goals requires deeper and faster transformation of societies. Business-As-Usual (BAU) approach simply cannot deliver. Government needs to harness all the tools at their disposal - technology, finance, policy and partnership - as means of delivery. The role of effective, accountable, transparent and inclusive public institutions is vital to build peaceful, just and inclusive societies. Public institutions need to mobilize private institutions and communities to achieve SDGs. The capacities and innovations in public institutions are to be enhanced for equitable and effective service delivery for all, particularly for the vulnerable groups and poorest. Information and communication technologies (ICT), particularly broadband connectivity can be the game changer to get us off the BAU path for achieving SDGs.

The purpose of this paper is to understand the e-Governance policy framework adopted by Government of India for building accountable, transparent and inclusive service delivery institutions, development of digital infrastructure and empowerment of people, which contributes towards sustainable development.

Keywords: Digital India, e-Governance, e-Government, Empowerment, Sustainable Development Goal.

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Introduction

The primary role of public administration institutions is the delivery of public services to the citizens as per the current and future aspirations of the citizens, but some time these needs are fulfilled initially and fail subsequently (Kumar and Best, 2006).

Traditional approach of governance, had several inhibiting factors such as demographics, language, caste, gender, mind set of people etc. to meet the aspirations of people of a large and diverse country like India having a large youth population. A new way of Governance, which is Strategic, Measurable, Achievable, Responsive and Transparent (SMART) is required to meet the challenge of dynamic aspirations of people (Graham, J., Amos, B. and Pulmptra, T., 2003). The role of effective, accountable, transparent and inclusive institutions is vital to achieve SMART governance and Information and Communication Technologies can play a catalyst role in SMART governance.

The United Nations General Assembly has recognised the role of information and communication technologies (ICTs) on several occasions in promoting sustainable development, supporting public policies and service delivery (UN, 2016). It has underscored that ICT has enabled breakthroughs "in Government and the provision of public services, education, healthcare and employment, as well as in business, agriculture and science, with greater numbers of people having access to services and data that might previously been out of reach or unaffordable" (UN, 2016). The General Assembly has also specifically affirmed the "potential of e-government in promoting transparency, accountability, efficiency and citizen engagement in public service delivery" (UN, 2016).

The world summit on Information Society (WSIS) in year 2003 and 2005 was devoted towards the potential of ICT and "people centric, inclusive and development oriented Information Society" where everyone can access & share information. The digital divide is to be bridged for people who are not able to access the potential of ICT through development of localized contents (WSIS, 2017). In year 2005, a working group of technical committee of International Federation for Information Processing (IFIP) has set up platform for the discussion and research on "ICT and Sustainable Development" (Toja, A. and Toja, S., 2016).

ICT has potential to speed and scale up wide range of technologies for nations to leapfrog to achieve key development milestone for the economy development through reducing the service delivery cost. It requires paradigm shift in policy to ensure that ICT is included as infrastructure for public service delivery such as health, education and energy. Ubiquitous access to broadband network will foster innovation, productivity, efficiency across the sectors and growth of internet economy and economy in general. It can help in overcoming the social and economic exclusion; can reduce the cost of services in the area healthcare, education, online banking services for financial inclusion (ICT & SDG, 2015).

Apart from innovations in technologies, the awareness about the availability and usability of technologies to people is foremost for the acceptance of technology. In past, information about the innovation spread through word of mouth, local demonstration and the scale up was gradual. The growth in awareness can be spread exponentially through internet, social media and other e-channel, making it easier to reach the people. People connected through national and global networks enable rapid innovation and up-gradation of the technologies. The emphasis is given to develop new technologies with open source - which enables the gain achieved in one part of globe can be adopted in other part of globe to help in up-gradation of technologies. It reduces the technology generation cycle, meaning the progress can be faster (ICT & SDG, 2015).

An integrated, economical and agile ICT approach is required for diffusion of technology for transformation of societies. It requires rapid expansion and upgrading of wireless broadband

infrastructure, paradigm shift in thinking of policy maker actors and institution, skill up-gradation of human capital and ICT Industry innovations for locally appropriate services.

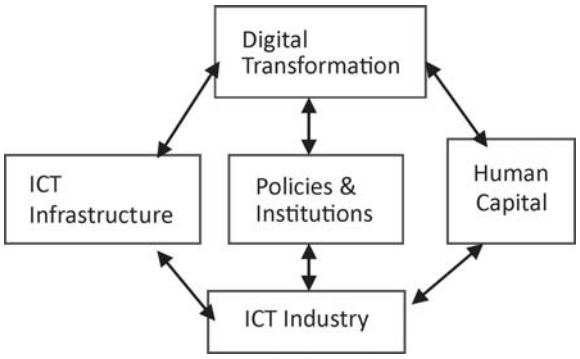


Figure 1: Public, Private Sectors and Government, Transforming to Network Society, Guide to policy makers, (ICT & SDGs, 2015)

In 1998, a task force was setup in India with the agenda to promote IT in various ministries/ departments for using information and communication technologies in delivery of public services. Learning experiences since year 1998 steered towards National e-Governance plan (NeGP) in year 2006, invigorated e-Governance Mission Mode Projects (MMPs) with enhanced budgetary support for MMPs. Learning experiences from some of the conceptualized and implemented MMPs under NeGP fostered NeGP2.0, i.e. e-Kranti in year 2015 under the umbrella of Digital India programme with an overall budgetary support of more than INR 1000 billon for digital India programme (CMAI, 2011).

People centric SDGs agenda of year 2030 has been adopted by Head of the States of United Nation's members with the commitment for the shared vision to improve the life of people and transform the world. The aim of SDGs is to move all the forces throughout the world to tackle the challenges of fighting poverty, reducing inequality and achieving SDGs. The domain of Information and Communication Technology (ICT) has a strong influence on the development of region, societies with innovation, efficiency and effectiveness in all sectors. ICT has become the integral part of business strategy, governance strategy and other walks of life.

It is the responsibility of the Government to develop the policy framework with coordination and cooperation of stakeholders for planning and implementation of e-Governance to move in the direction of achieving Sustainable Development Goals. Achieving SDGs requires Government commitment, dynamic leadership for far sighted and holistic decisions, creativity and innovation, adequate capacities and means of implementation. Public and private stakeholders have to play an integrated and balanced role. Policy integration and institutional coordination is needed for synergy and interrelation between SDGs.

Methodology

This study is qualitative, explorative and descriptive in nature based on secondary data collected from various web sites, research papers publications on e-Governance. The study is in reference to e- Governance policy of India for empowering the people of India for achieving the sustainable goals. An Overview of e-Governance policy of India is presented in section 3, section 4 indicates role of e-Governance in Sustainable Development (e-Gov4SD) and section 5 indicates

schemes / programmes initiatives taken by the Government of India in the direction of Sustainable development goals.

e-Governance Policy of India

Since the inception of e-Governance in India, the e-Governance projects have been conceptualized and implemented with the existing planning and implementation strategy framework of plan scheme of NITI Aayog (erstwhile planning commission) to achieve the target set for the period of plan. The genesis detailing, approval and implementation of plan was sequential in nature with top down approach at the Centre as well as State Government (Suri and Sushil, 2012).

Different scholars from developing countries including India have pointed to the limitation of top down approach which prevents the benefits reaching to the targeted beneficiaries. In India, Government planning is defined within the pre defined boundaries and is one time exercise with little scope of flexibility. It mainly depends upon top level executives and the implementers have very little role to play in planning (Pande, 2004). In reality, the actions of implementer are not in tune with the planner. Deficiency in collaboration, which may be due to lack of planning and strategy formulation capacities at grassroots level, time and resources constraints for deliberation with various stakeholders, inhabitation for free flow of idea from bottom to top due to hierarchical structure (Chakravarty, 1987).

The inefficiencies of static centralized planning system have been realized at the planners' level and State Governments have been advised to plan taking local factors into consideration in several sectors especially where the implementation is carried out in states. The anticipation of future requirements based on one time static plans is bottleneck and are therefore incapable of handling the dynamic characteristic requirement of e-governance projects. The flexibility to deviate from the approached framework for handling emergent situation is important as the maturity time for e-Governance project is large and requires instant corrective measures as per requirement. Such projects are bound to be affected by the limitation of overall system (Suri and Sushil, 2012).

National Institute of Transforming India (NITI) Aayog has been established on January 1, 2015, is key stakeholder for designing, implementing and monitoring policy for SGDs in India. It has replaced the Planning Commission Instituted in year 1950 to carry out the reform agenda of Government of India for the citizens of country. It acts as quintessential platform of Government of India to bring states to act together in order to have faster cooperative federalism (NITI Aayog, 2016). NITI Aayog is working on the principles of bottom up approach rather than top down model. Sub groups of States Chief Minister have been constituted for critical policy issues for the centrally sponsored schemes. The deliberation of sub groups through negotiation, persuasion and collaboration are incorporated directly into the policies of the Union Government. A task force has been established for the elimination of poverty and agriculture development as per 2030 agenda of Sustainable Development Goals (NITI Aayog, 2016). Ministry of health, government of India has set up task force to achieve SDG3 - Good Health and Well being for all (Task force on Sustainable Development Goal-3, 2016). The SDGs can be achieved with high standard of governance at all levels and role of ICT has been established for SMART Governance (NITI Aayog, 2016).

The learning experiences of technology usage challenges in service delivery to people of country led to National e-Governance Plan (NeGP) in 2006 with focus on Mission Mode e- Governance Projects. The planning and implementation inefficiencies of National e-Governance Plan-2006 (NeGP) of Government of India for e-Governance Projects have been addressed in e-Governance policy initiatives (e-Kranti) under Digital India programme. Effective implementation of e-Governance

for service deliveries to citizens is the key component of Digital India programme. These policy initiatives are the endeavour to draw improved roadmap for the implementation of the e-Governance projects in India (e- Gov Policy Initiatives under Digital India, 2015).

The major focus of e-Kranti is on collaborative application development using open source as common application software (CAS), which can be configured in Central/State Government departments without the need of modifying the core code of application on cloud platform to avoid the duplication in efforts and economy in time and cost resources. The applications developed using guidelines makes them standardized and compatible for hosting and running in various organisations of the Central/State Governments.

Kranti Framework

e-Kranti under Digital India programme with the aims of transforming India into digitally empowered society is vital for easy, efficient and effective governance in India. The digital India programme has 9 pillars. The emphasis of pillar 4 is on Governance reforms through technology. The emphasis on governance reforms is through government Process Re-engineering (GPR) using IT, Electronic Data bases, Work flow automation and Public Grievance Redressal using IT. Pillar 5 emphasis is on e-Kranti: public services delivery through electronics. The thrust areas and sub components of e-Kranti are: e-Education, e-Healthcare, Technology for Planning, Farmers, Security, Financial inclusion, Justice, Cyber Security. The e-Kranti framework gives emphasis on various factors: integrated service approach, inter operable, standardization, localized language, multiple channels in designing of e-Governance Mission Mode Projects for efficient and effective services delivery to citizens at affordable costs (e- Gov Policy Initiatives under Digital India, 2015).

The framework highlights about outcome based services to citizens, business and government using common ICT infrastructure like GI Cloud, National/State Data Centre, Mobile Seva, State Wide Area Network, Common Service Centre (CSC) & Electronic Service Delivery gateway. The Aadhaar based ID for services delivery to citizens will be facilitated.

Multiple agencies are involved in e-Kranti programme, Role and Responsibilities have been defined to create an appropriate management structure for effective delivery of Public Services. Ministry of Information Technology (MeitY), Govt. of India is Nodal agency for over all policy strategy and resolving inter ministerial issues. The ownership of MMPs is with the line Ministries/ Departments for Central Government and State Government. The detailed services about the project will be planned with consultation of end users by advisory committee with representation of end users to reduce the planning and implementation gap. The Chief Secretary will monitor the implementation of State level MMPs. The MMPs in the portfolio of e-Kranti may be exempted from the budgetary restrictions and cut to avoid the delay in completion of projects.

The inter departmental integration and inter operable issues will be resolved at the level of Cabinet Secretary's Committee and technical issues of integrated projects will be resolved at the level of mission Leader under the Secretary of MeitY.

Open Source Software Framework (OSSF) : In order to make digital services affordable and sustainable to the citizens of country, Govt. of India endeavour is to use open source software in all e-Governance Projects for all the organizations as an option wherever possible to leverage economic and strategic benefits (e- Gov Policy Initiatives under Digital India, 2015). National IT policy 2012 in one of its objectives advocates the adoption of open source, open standard and open technologies. The availability of source code helps the open source software community for study and modification. The source code is free, which reduce the overall cost of the project. The availability of application source code for customization is the main reason why,

Governments throughout the globe are trying to promote application development in open source software for innovations, optimisation of costs in implementation of ICT in Governments.

The Open Source Software framework adopted by Government of India provides the guidance for adoption of open source software in Government departments as a preferred option than closed source software (CSS) for National/State Projects. This framework helps the Government departments and agencies in identification and selection of OSS solutions (e- Gov Policy Initiatives under Digital India, 2015).

The adoption of open technologies usage policy of Government of India with emphasis on technological compatibility based on standards, localization of contents, data/software security, reusability of software, absence of proprietary lock-in, freedom to modify and improve etc. will lead to rapid and easy to scale design of sustainable software applications for sustainable development. The application software plays a critical role in sustainability of application. It can have north push of consumption of resources, in equality in society but also can create democratic process, freedom for individual and also resource conservation (Becker, C., Easterbrook, S. and Penzenstadler, B., 2015). The design of the software can have long term consequences depending upon the intentions of the designer. The designer has to understand that sustainability applies to both; a system itself and its wider system of which it will part with.

The key stakeholders such as software designers, researchers, professional associations, educators, customers and users can play important roles in designing of software which can meet the requirement on current generation without comprising the needs of future generation.

e-Governance for Sustainable Development (e-Gov4SD)

Development can be defined in terms of social, economical, environmental and institutional. Traditionally, efforts for development were carried out in isolated manner for different domains, without considering the impact in other areas, for instance industrial development activities led to economic development but had effected environment adversely. It has led to wealth growth, but the gap in society has increased and undermined the societal sustainability.

Sustainable development (SD) refers to holistic and integrated approach to development in different areas of development; economic, social, environmental and institutional taking account of current as well as future generation requirements (World Commission on Environment and Development, 1987). This requires that needs of different groups of society, which are affected by such developmental initiatives are taken in account as part of governance for SD (Estevez, E., Janowski, T. and Dzhusupova, Z., 2013).

Governments are major players in SD process, ensuring the needs of all sections are addressed. They coordinate and collaborate with non state actors for participation using IT as means. This process is used for transforming the internal processes and for interaction with the stakeholders such as citizens, business and other arms of the society-e-Gov, when applied in the context of SD; we can redefine e-Governance into e-Gov4SD. It can be referred as use of IT to support public administration, public services, interaction between government and people for participation in decision making process for social equity and socio-economic development and protection of environment for future generation (Estevez, E. and Janowski, T. and Dzhusupova, Z., 2013).

There are five pillars of e-Gov; Government, Technology, Interaction, Customer, Society, which lie in the solution domain for Sustainable development in terms of social, environmental, economic and institutional which lie in problem domain of e-Gov4SD framework.

Problem domain		e-Governance (Solution Domain)				
		Government	Technology	Interaction	Customer	Society
Social	SD					
Environmental						
Economic						
Institutional						

Figure 2: E-Gov 4SD Conceptual Framework
(Estevez, E. and Janowski, T and Dzhussupova, Z. ,2013)

The cell of matrix defines the contribution space matching problems and solutions across dimension.

Illustrative Initiatives taken by Government of India toward SDGs

Some of the initiatives taken by the Government of India with technology as integral part of scheme/programmes in the direction of SDGs:

Table1: Some Initiatives towards SDGs

Scheme/programme	Indicators	SDG
Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)	1. Employment through public works, Development of Agriculture infrastructure, Productive assets and entrepreneurship based livelihood opportunities. 2. Over 2 billion persons-days of employment. 3. Women and disadvantage group benefited.	• No Poverty (SDG1) • Zero Hunger (SDG2) • Gender Equality (SDG5) • Decent Work and Economic Growth (SDG8) • Reduce Inequality (SDG 10)
Pradhan Mantri Jan Dhan Yojana (PMJDY)	1. Access to financial services; banking credit, insurance and pensions. 2. 280 millions bank accounts in one year.	• No Poverty (SDG1) • Zero Hunger (SDG2) • Good Health and Well being for All (SDG3) • Gender Equality

Pradhan Mantri Jan Dhan Yojana (PMJDY)	1. Access to financial services; banking credit, insurance and pensions. 2. 280 millions bank accounts in one year. 3. Delivery of payments from Government benefits schemes directly to bank accounts. 4. Minimising leakages, enhancing the effectiveness of social security schemes, saving in expenditure.	• No Poverty (SDG1) • Zero Hunger (SDG2) • Good Health and Well being for All (SDG3) • Gender Equality (SDG5) • Reduce Inequality (SDG 10)
Deen Dayal Antyodaya Yojana (DAY)	1. Bring one Female Member from Poor Household in Rural Area into Self Help Group (SHG) for sustainable livelihood through skill development.	• No Poverty (SDG1) • Zero Hunger (SDG2) • Good Health and Well being for All (SDG3) • Gender Equality (SDG5) • Reduce Inequality (SDG 10)
Access to Basic Services	1. Right to Education (6-14 years) for Free and Compulsory Education. 2. Universalising Primary Health Care. 3. Integrated Child Development Services (ICDS) for addressing Maternal and Child Nutrition.	• No Poverty (SDG1) • Zero Hunger (SDG2) • Good Health and Well being for All (SDG3) • Quality Education (SDG4) • Gender Equality (SDG5) • Reduce Inequality (SDG 10)
Pradhan Mantri Ujjwala Yojana	1. Liquid Petroleum Gas (LPG) Connection to Poor Families.	• No Poverty (SDG1) • Good Health and Well being for All (SDG3) • Reduce Inequality (SDG 10)
Food Security and Improved Nutrition	1. Food security programme for 800 million people at affordable prices. 2. Ration Card in name of Female member of family. 3. Digitization of 232 million ration cards. 4. Automation of Food Items Delivery Outlets 5. Mid Day Meal Scheme for Children in Primary School.	• No Poverty (SDG1) • Zero Hunger (SDG2) • Good Health and Well being for All (SDG3) • Gender Equality (SDG5)

	1. Reduction in Infant Mortality Rate (IMR). 2. Reduction in Under 5 Years Mortality Rate. 3. Reduction in Total Fertility Rate. 4. Increase in Institutional Deliveries. 5. Mission Indradhunsh (Rainbow) for Children Vaccination. 6. Digitisation of ICDS Centres for Real Time Monitoring of Services Deliveries.	• No Poverty (SDG1) • Zero Hunger (SDG2) • Good Health and Well being for All (SDG3)
Beti Bachao Beti Padhao (Save Girl Child, Educate Girl Child) Increase Access to Employment	1. Improvement in Sex ratio. 2. Mahila E-haat; Technology based Marketing Platform for Women Entrepreneurs and SHGs. 3. Stand Up India; Bank Loans to Women to set up Green Field Enterprise. 4. Mahila Shakti Kendra at Village level; for Skill Development, Literacy for Women.	• No Poverty (SDG1) • Zero Hunger (SDG2) • Gender Equality (SDG5) • Decent Work and Economic Growth (SDG8)
Deen Dayal Upadhyaya Gram Joyti Yojana Pradhan Mantri MUDRA Yojana Pradhan Mantri Rural Road	1. Electrification of All Villages. 2. Easy Credit for Small Scale Entrepreneurs. 3. Special Incentives for Textile and Apparel Sector; Job creation for Women. 4. All habitations of more than 500 population to be connected with all weather roads.	• No Poverty (SDG1) • Zero Hunger (SDG2) • Gender Equality (SDG5) • Decent Work and Economic Growth (SDG8) • Industry, Innovation and Infrastructure (SDG 9)

Make in India Digital India Skill India	5. Development of Industrial Corridors. 6. Setting of manufacturing units for infrastructure sectors such as Electronics, Automobile, Defence, Aviation etc. 7. Integration of services from various government agencies for single window clearance. 8. Bharat Broadband Network For Gram Panchyats (Appox. 2,50,000). 9. Emphasis on Technology; Aadhar, DBT, Decision Based on GIS, Atal Innovation Centres. 10. Skill Development of Youth.	
Meeting the financial requirements gaps for SDGs Tax Reform: Goods and Services Tax	1. Improving GDP- Tax Ratio 2. Strengthen of Tax Administration System 3. Mechanism for control of illicit fund flow, pursuing tax heaven countries 4. Assistant from Developed Countries specially for Climate Change 5. Increase in Tax Devolution to States from 32% to 42% 6. Public Finance Management System for Real Time	• No Poverty (SDG1) • Zero Hunger (SDG2) • Good Health and Well being for All (SDG3) • Partnership for Goals (SDG17)

Source: Voluntary National Review Report (2017)

Limitation and Challenges

e-Governance has the potential to improve the government citizen relationship. It has limitation and challenges, which needs to be addressed. Digital Governance is able to reduce the gap between have and have not up to certain limit. There is gap between the availability of technology and utilization by the citizen. Availability of ICT is not sufficient in itself; there are other factors like reliable digital infrastructure, institutional and political will, transparency in Government functioning, utilization of resources through sharing by multiple agencies, user's digital literacy and resources. Digital technologies can provide the information and opportunities for empowerment and engagement but participation by citizens is important for fully measuring the empowerment.

Conclusion

The digital policy under digital India programme with emphasis of creation of digital infrastructure like BharatNet, CSC2.0, Deen Dayal Upadyaya Gram Jyoti Yojana, Digi Locker, National Digital Literacy Mission, Digitize India (Digital India, 2017) and initiatives of empowerment like skill development programme, Jan Dhan Yojana for financial inclusion, Unified Mobile application for new age Governance (UMANG) app for e- Gov services etc. have helped in creating conducive environment for achieving the sustainable development goals. This will help in achieving the intended objective of digital India policy of transforming the Indian society to empowered knowledge based society, which will act as mile stone for achieving the sustainable development goals.

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Developing Multi-criteria Based Decision Support Framework for Sustainable Healthcare Waste Management in India

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Abstract

Today, healthcare waste management is a burning issue across the world. Reports have been released regularly by various international and local bodies for creating awareness about the hazardous impact of healthcare waste on humans and animals. World Health Organization (WHO) has been actively playing role in improving the situation of healthcare waste management by seamlessly emphasizing onthe significance of creating awareness, technological, and managerial solutions. The technological innovations are majorly unaffordable for adoption for the management of healthcare waste in developing countries whereas the effective managerial solutions are not available to the key decision makers, i.e. hospitals and healthcare waste disposal firms,for implementation. Keeping in view to the various constraints including budgetary constraints, an effective managerial solution to key decision makers,in terms of amulti-criteriadecision support framework, has been proposed in this study. This decision support framework can be easily adopted and implemented for improving the situation of healthcare waste management in developing countries across the world.

Keywords: Healthcare waste, Hospitals, Healthcare waste disposal firms, Multi-criteria decision making methods, Optimization and Statistical Modelling, Sustainability.

Introduction

The waste that comes out of different healthcare facilities such as clinics, nursing homes, hospitals, pathology labs, and medical research centres, has been categorized as healthcare waste (WHO, 2013). This waste consists of blooded cottons, bandages, infected syringes, scalpels, body parts, chemicals, cytotoxics, and radioactive materials (Pruss et al., 1999). The presence of the mentioned infectious and hazardous components converts healthcare waste into a life taking object for humans as well as animals(Chauhan and Singh, 2016). The improper disposal of infectious syringes and scalpels plays a major role in increasing the number of HIV infection in rag pickers (Ananth et al., 2010). In 2010, 33 800 new HIV infections, 1.7 million hepatitis B infections and 315 000 hepatitis C cases of infections hadbeen reported across the world (WHO, 2013). In spite of this, the hospitals pay least attention for the proper disposal of their waste. According to practitioners, the cause of paying limited attention is the realisation of its investments into costs.The US agency, OSTP (2014) revealed that despite the heavy generation of CO_2 and harmful emissions, i.e. 380 kg and 80 kg carbon equivalents per patient per day, respectively, the investment of government in healthcare waste disposal activities is extremely low.

Ithas been observed from the literature that the healthcare waste management, in developing countries, has been paid very limited attention in comparison to other wastes such as municipal

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solid waste, e-waste, etc. (Adedigba et al., 2010; Coker et al., 2009). In India, the healthcare waste management rules had been introduced by Ministry of Environment and Forest (MoEF), first time, in 1998 and revised in 2011 and 2015, respectively. However, in spite of the strict rules and regulations of environmental bodies a remarkable improvement from the perspective of methods of disposal and management procedure could not be traced in reality. Hence, to overcome this deficiency a complete solution for managing healthcare waste has been proposed in this study.

The remainder of the paper has been organized as follows: Section 2 provides the evidences from literature for building up a theoretical framework. The research methodology for addressing the objectives is provided in Section 3. Section 4 is sufficed with the detailing ofthis multi-criteria based decision support framework. Section 5 concludes the study with its implications on environment and key decision makersin Section 6.

Evidences from literature

The research work on healthcare waste management has its roots in the seminal work of Pruss et al. (1999). The definition of healthcare waste management was introduced and amended regularly by World Health Organization with the help of academicians, practitioners, and researchers across the world. In spite of this, there has been a continuous demand from the researchers to amend the definition according to their own region or country to better define the categories of infectious HCW and hazardous HCW and for an easier understanding of legislation (Askarian et al., 2012; Caniato et al., 2015; Ferreira and Teixeira, 2010).

In the reported literature, it has been found that studies on HCWM have been conducted to understand the composition and quantities of HCW generation (Moreira & Gunther, 2013; Patil & Shekdar, 2001), to explore the best practices for enhancing HCWM (Ananth et al., 2010; Kumar et al., 2014; Sharma and Chauhan, 2008), to select the method of treatment and disposal of HCW (Huang & Lin, 2008; Liu et al., 2014; Liu et al., 2013), and to reveal the potential of recycling and reuse in HCW (Campion et al., 2015; Lee et al., 2002).

Review of the studies conducted focusing on the composition of healthcare waste

In the reported literature, a long list of studies are available that deal with topics related to the estimation of the generation of HCW per bed, per day, per department, etc. Additionally, a large number of studies have been conducted to find the composition of healthcare waste coming from particular healthcare facility/facilities. Therefore, in this section, the reported studies have been reviewed to identify the major contribution from researchers on revealing the composition and estimation of the quantities of HCW generation.

Patil and Shekdar (2001) estimated that the HCW generation rate in India was 0.5-2 kg bed^{-1} day^{-1}. They estimated the total quantity of waste as 0.33 million tonnes of waste per year with a composition of 40-45 % general waste, 7-10 % plastics, 3-5 % glass, and 30-35 % infectious HCW. Altin et al. (2003) revealed information about the composition of HCW in four hospitals in Turkey. They found that 92 % of healthcare waste was combustible in nature; whereas, 8 % was non-combustible. They estimated the waste generation rate as 1.25-2.6 kg bed^{-1} day^{-1}. Reza Sabour et al. (2007) formulated a regression model, using the number of hospitals and active bed, to predict the generation and composition of HCW in each province of Iran. Graikos et al. (2010) conducted a study to determine the production rate and the composition of HCW in the Social Insurance Institute, Xanthi, Greece. Voudrias et al. (2012) carried out a study to estimate the composition and production rate of pharmaceutical and chemical waste in Greece. Nabizadeh et al. (2012) conducted a study to estimate the composition and production rate of HCW in Hamadan, Iran. They found that 71.15 %, 21.40 %, 7.26 %, and 0.18 % denoted the general,

infectious, chemical and pharmaceutical, and toxic waste, respectively, in the composition of dental waste. Zhang et al. (2013) investigated healthcare facilities to reveal their HCW generation quantities and composition in Gansu Province, China. They found that the quantities of generation of HCW in primary, secondary, and tertiary HCFs were 0.61, 0.59, and 0.79 kg bed^{-1} day^{-1}, respectively. Maamari et al. (2015) analyzed the generation rates and patterns of HCW collected from 57 hospitals in Lebanon. The results of the study showed that the small private hospitals (<=100 beds) and large private hospitals (=>200 beds) generated the infectious HCW as 1.14 kg bed^{-1} day^{-1} and 2.45 kg bed^{-1} day^{-1}, respectively. Moreira & Gunther (2013)assessed the HCWM plan on the basis of composition and quantities of generated HCW at primary healthcare facilities (PHFs) in Sao Polo Brazil.

Review of the studies conducted to explore best practices in healthcare waste management

In the reported literature, a large number of studies have been found that focus on the identification of best practices (drivers) for improving HCWM at different healthcare facilities. This information helps in understanding, identifying, and providing an exhaustive list of the best practices from the reported literature. Along with this, it also helps to identify related research issues based on reported best practices.

Caniato et al. (2015) reported a review of literature on HCWM considering the low, middle, and high income countries across the globe. They mentioned the best practices and key definitions for the most significant factor for better HCWM. They stated that the development of a sustainable HCWM plan and its execution with the help of best practices, such as proper segregation, regular training and awareness programs for healthcare personnel, educating patients and the public, administrative monitoring and control, implementation of legislations, etc., at the level of healthcare facility, province, and waste disposal facility, is required at the present time in developing countries. Patil and Shekdar (2001) attributed the poor management of HCW in different healthcare facilities to technological inefficiency, lack of funding, and lack of trained professionals for healthcare waste management. Askarian et al. (2004) noted that the lack of segregation between hazardous and non-hazardous waste, lack of implementation of the laws related to collection of waste from patient wards and temporary storage sites, disposal of HCW with MSW, lack of training of personnel, lack of personnel protective equipment, and insufficient knowledge of the proper use of these equipment were the significant issues existed in the healthcare facilities.

Gupta & Boojh (2006) reported the lack of segregation of infectious and non-infectious waste and a 2-3 day holding of the waste in the hospital, the lack of a treatment facility for infectious waste on hospital premises, the open dumping of the waste coming from research laboratories, and health hazards to rag-pickers due to infected syringes etc., in Balrampur hospital. Bdour et al. (2007) noticed the lack of implementation of bio-medical waste management rules that leads to the poor segregation and high quantities of HCW. Alagoz & Kocasoy (2008) noticed the lack of appropriate laws and effective control, lack of awareness, and financial constraints leading to poor management of this waste. Arab et al. (2008)reported that the lack of warning signs at temporary storage sites, poor segregation of waste, and the absence of waste treatment and disposal equipment in hospitals led to poor healthcare waste management in Tehran. Sharma & Chauhan (2008) carried out a study to assess the biomedical waste management of three large hospitals in Agra, India. They found that the lack of knowledge, lack of awareness, and old technology for disposal leads to poor HCWM.

Birpinar et al. (2009) conducted a study in the hospitals of Turkey and found a lack of appropriate waste containers, a lack of temporary waste storage sites in hospital premises, and a lack of personnel protective equipment for safe handling of HCW. Rao (2009) noted issues, such as

budget constraints, training and awareness programs for healthcare workers, lack of a waste management officer in many hospitals, irregular monitoring and control, and the lack of use of proper color-coded bags for source segregation at the micro level. Omar et al. (2012) found poor waste segregation practices, improper usage of color-coded bags, poor usage of waste containers, improper record keeping of waste generation quantities, absence of temporary waste storage sites, and lack of training and awareness programs. Longe (2012) conducted a study in 20 healthcare facilities containing 20 to 600 beds in Ikorodu and Lagos state of Nigeria. They found that the healthcare facilities have a lack of waste treatment systems, lack of funds, and lack of professionally trained waste management officers.

Shiferaw et al. (2012) carried out a study to understand the causes of diseases occurring from sharps, blood, and bloodied body fluids to healthcare personnel. They found that less than 50 % of workers wore gloves or boots, workers lacked knowledge of HIV and hepatitis B, and that a lack of personnel protective equipment led to the diseases. Kumari et al. (2013) discussed a report of the Civic Action Group (CAG), which pointed to the lack of awareness and lack of commitment of senior officials at the hospital and government level leading to poor HCWM in hospitals. Therefore, it has been argued by the researchers that there is an urgent need for a HCWM plan that could include the sound arrangement of a healthcare facility, using appropriate technology, operational plans, financial management, and timely training programs for staff, highlighting the importance of risk management within and outside of a hospital, the health and safety of healthcare workers, training programs, and an emphasis on segregation for recycling and better disposal of HCW.

Mostafa et al. (2009) carried out a study assessing the knowledge and awareness of doctors, nurses, ward boys, and housekeeping staff at Al-Mansoura University Hospital, Egypt. They revealed that the healthcare personnel, including doctors and housekeeping staff, did not have an adequate knowledge and awareness about HCW. However, the results showed that training of nurses was positively related to the knowledge they carry about HCW. On the basis of the findings, they formulated and implemented protocols to enhance HCWM. Al-Khatib & Sato (2009) conducted a study to assess the implemented HCWM practices in the Palestinian Territory. They found that the practices were not implemented properly according to WHO standards; therefore, the policies, along with a comprehensive plan, should be implemented to provide a technologically sound and environmentally sustainable HCWM plan. Khammaneechan et al. (2011) conducted a study to assess the implementation of practices related to HCWM. Lakbala & Lakbala (2013) carried out a study to assess the knowledge and attitude of healthcare workers towards HCWM in Shiraz, Iran. Gavrancic et al. (2012) conducted a study to assess the implementation of a national strategy for HCWM at the Oncology Institute, Serbia. They evaluated the collection, segregation, storage, handling, transportation, and disposal of HCWs at this healthcare facility.

Ratkovic et al. (2012) assessed the efficiency of 35 healthcare facilities on the basis of technology implementation in the collection and disposal of HCW using a data envelopment analysis method in Serbia. They found that 60 % (21) of the healthcare facilities were inefficient with an average level of inefficiency of 13 %. They stated that the findings of the study could be useful in providing insights for better planning and management of HCW. Chaerul et al. (2008) studied the interaction among the factors of HCWM using a system dynamics approach. They concluded that the implementation of an effective segregation plan would help in minimizing the risk as well as harmful emissions associated with the handling and disposal of this waste. Ali et al. (2016) conducted a study identifying the motivating factors for HCWM in developing countries. The indicators including cleanliness, implementation of legislation, training and awareness programs, and availability of funds etc., for a healthcare facility were clubbed to

form three motivating factors, i.e., reputation, liability, and expenses. They concluded that the concerns of the healthcare facilities vary considerably for liability and financial burden from one facility to another; however, it did not deflect much for the reputation of a healthcare facility in the implementation of a sound HCWM plan. Furthermore, they recommended analyzing the social, economic, environmental, and organizational factors using multi-criteria decision making methods. Moreira & Gunther (2013) argued proposing a method for evaluation of a HCWM plan including quantitative and qualitative parameters for better monitoring. These parameters could be legislation, training and awareness programs, inspection of safety equipment provided to workers, and reduction in the volume of waste reaching sanitary landfilling sites with the help of enhanced segregation of waste. Lee et al. (2002) studied the potential of recycling the plastic waste generated in hospitals. The advancement of technology, such as the development of chlorine free blood bags as an alternative to PVC, diminishes the harmful emissions associated with incineration of waste (Altin et al., 2003; Ratkovic et al., 2012).

Review of the studies conducted on disposal of healthcare waste

The disposal of HCW has been considered an important issue to be researched due to its social and environmental implications. In the reported studies, most of the research work has been conducted for estimating harmful emissions and poisonous gasses generated from burning of this waste. This section reviews the reported studies for disposal related issues and paves the way for management research of HCW.

Alvim-Ferraz & Afonso (2005) carried out a study for assessing the percentage of harmful emissions which occurs in the disposal of HCW. They found that the incineration of this results into the 80 % harmful emissions which could be curbed with the help of an effective segregation and disposal strategy of HCWM. Mbongwe et al. (2008) explored the need of an organized HCWM system so that the risk associated with the generation of harmful emissions in incineration could be computed and compiled. Cheng et al. (2009) stated that heavy quantities of infectious HCW were incinerated in hospitals that led to the production of large quantities of harmful emissions. Liu et al. (2013) stated that the incineration, steam sterilization, microwaving, and landfilling could be the methods of disposal for HCW at a central waste disposal facility. The selection of a method of disposal depends on economic, social, and environmental factors (Dursun et al., 2011; Liu et al., 2014). Aghapour et al. (2013) recommended providing training and awareness programs for conducting the correct biological tests for the HCW for sterilizing and appropriate autoclaving of the infectious and hazardous HCW.

Bdour et al. (2007) studied the procedures, techniques, and methods of handling and disposal of HCW along with the qualitative and quantitative properties of HCW to assess the weight and physical properties, respectively. They noticed the lack of implementation of bio-medical waste management rules that leads to the poor segregation and high quantities of generation of HCW. Therefore, they recommended the urgent need to address the issues related to collection, segregation, handling, storage, and disposal of HCW. Coker et al. (2009) stated that the formulation of policies and implementation of legislation regarding collection, segregation, handling, transportation, and disposal for safe management of HCW is needed in a country. Additionally, they suggested conducting regular training programs for safe handling of this waste. Ratkovic et al. (2012) assessed the efficiency of 35 healthcare facilities on the basis of technology implementation in the collection and disposal of HCW using the data envelopment analysis method in Serbia. Gavrancic et al. (2012) evaluated the collection, segregation, storage, handling, transportation, and disposal of this healthcare facility. Sartaj and Arabgol (2014) carried out a study for the assessment of HCWM practices, such as collection, segregation, handling, storage, transportation, treatment, and disposal in Isfahan Province (Iran).

Bella et al. (2012) concluded that onsite incineration is an effective solution for the developing countries, such as Somaliland. Lee et al. (2004) stated that the combination of onsite incineration with microwave technologies for the treatment and disposal was the most sustainable approach in terms of economic and environmental sustainability. However, Taghipour et al. (2014) assessed and compared onsite treatment and disposal with offsite treatment and disposal of HCW. They noted that onsite treatment and disposal of HCW lack plans, finances, the determination of the capacity of the installations, proper operations, and maintenance. Therefore, they suggested the centralized offsite treatment and disposal of HCW. Karagiannidis et al. (2010) argued that a central HCW treatment and disposal firm assists the hospitals in reducing the environmental impact and cost of disposal of HCW.

Nema et al. (2011) highlighted the importance of private players, such as common HCW disposal firms or outsourcing firms. Therefore, it was suggested that hospitals use services from these centralized HCWM treatment and disposal firms for safe disposal of this waste (Abdulla et al., 2008; Bendjoudi et al., 2009; Verma et al., 2008). Graikos et al. (2010) suggested the disposal of infectious HCW with the help of an outsourcing firm for safe and cost-effective disposal. Ho (2011) conducted a study for the selection of an appropriateHCW disposal firm for the hospitals of Taiwan using fuzzy analytic hierarchy process. Hsu et al. (2008) addressed the problem of selection of a HCW disposal firm for the hospitals of Taiwan. They recommended that the selection of a sustainable HCW disposal firm by a hospital depends on the contractor's qualification, contractor's service capability, contractor's equipment, etc. Liu et al. (2014) conducted a study for the selection a HCW treatment and disposal technology using a multi-criteria method (interval 2-tuple MULTIMOORA). They recommended dealing with the issue of HCW disposal/ outsourcing firm selection using multiple criteria.

Ciplak & Barton (2012) carried out a study for selecting and planning the treatment capacity of a HCW disposal firm with the help of a system dynamics approach. They recommended the application of multi-criteria decision making methods for selecting an appropriate HCW disposal firm. They also suggested the consideration of environmental, social, and economic criteria for the waste disposal firm's facility location. Ruoyan et al. (2010) pointed out that a sufficient budget and attentive administrative monitoring is required for the establishment and function of an offsite common HCW treatment and disposal facility. The future capacity planning of a disposal firm for the disposal of HCW was another major issue highlighted by authors.

The studies reveal that healthcare facilities produce a high content of waste materials that could be recycled with the help of competent technology and infrastructure (Altin et al., 2003; Coker et al., 2009; Jang et al., 2006; Lee et al., 2002; Sawalem et al., 2009). Additionally, some researchers criticized the process of waste disposal through incineration, dumping, or landfilling (Adedigba et al., 2010; Alvim-Ferraz and Afonso, 2005; Nemathaga et al., 2008; Tamplin et al., 2005). Some researchers emphasized the benefits of HCW recycling that could outweigh the other treatment and disposal methods (Bdour et al., 2007; Campion et al., 2015; Jang et al., 2006). HCW recycling is a more sustainable approach because it adds weight and covers the shortfall and weaknesses of other disposal methods.

Countries like India and China account for almost 38 % of the world's population and generate a large amount of waste: therefore, there is a need for research in HCWM in these countries. Although we have found many HCWM studies from these countries, most of them focus on the computational aspects of generated waste and its composition. Many of them have suggested improving segregation practices by waste separation at the source, leading to minimum waste for incineration and landfilling, thereby increasing the scope of recycling. Although past studies highlighted the seriousness of the issue in the future, a study of the development of a

comprehensive and sustainable plan for HCWM to deal with the large quantities of HCW in these countries is missing in the literature. Therefore, it can be concluded from our review of literature that there is an evident need for better HCW disposal alternatives, such as recycling, in order to address issues with the environment, human health, and resource conservation.

Based on the review of literature in the above mentioned three sections, it can be stated that the previous studies have attempted to work upon a specific issue in spite of providing a complete managerial solution model to hospitals and waste disposal firms. Majorly, the work included the understanding of waste generation rates, assessing the impact of training and awareness programs on healthcare waste management, the disposal of healthcare waste and impact of toxic emissions on environment. Few behavioural studies such as establishing the relationship between attitude of a healthcare worker and quantity of waste generated. However, the studies such as identifying and analysing the drivers for effectively managing healthcare waste at hospitals, comparatively assessing the waste management of different hospitals, selection of healthcare waste disposal (outsourcing) firms, the identification of an appropriate location for establishing a plant for waste disposal, the capacity planning of a healthcare waste disposal plant, the optimization of resources in collecting healthcare waste from hospitals for disposal at plant, and the plant layout design has not been paid adequate attention in the literature.

Research Gap & Research Problem

In the nut-shell it can be stated that the development of this multi-criteria decision support framework would help in addressing the following issues/gaps:

- To identify and model the drivers of HCMW to understand their inter-relationships.
- To evaluate the selected drivers and develop a comparative assessment model on the basis of these drivers.
- To assist the hospitals in selecting an appropriate HCW disposal firm with the help of a hybrid model.
- To assist the HCW disposal firms in the selection of healthcare waste disposal facility locations.
- To develop a forecasting model of HCW generation for assisting HCW disposal firm in its capacity planning.
- To formulate a reverse logistics model for optimizing the resources used for collecting the healthcare waste from hospitals.

Hence, to address this void in the literature, the development of a theoretical decision support framework would assist the key decision makers in making effective decisions for enhancing healthcare waste management in developing countries.

Research Methodology

The objectives highlighted in the previous section can be handled effectively using multi-criteria decision making methods such as interpretive structural modelling method (ISM), decision making trial and evaluation laboratory method (DEMATEL), analytic hierarchy process method (AHP), analytic network process method (ANP), technique for order preference by similarity to ideal solution method (TOPSIS). The optimization models such as integer linear programming, deterministic, dynamic, stochastic, and goal programming can be used for reverse logistics model development for waste collection. The statistical methods such as regression and ARIMA modelling help in understanding the co-relation and advance planning of healthcare waste disposal.

Proposed multi-criteriadecision support framework for HCWM

Healthcare waste management of a country highly depend upon the positive participation of key decision makers towards this issue. The key decision makers include the hospital for managing the waste within its premises and the healthcare waste disposal firms which collect and dispose the waste at a safe place.In hospitals, the key participants of waste management team consist of a waste management officer, medical superintendent, head nurse and other members. The waste management team has the responsibility to continuously monitor the management of waste with the given economic and environmental constraints. The decisions within the premises of hospital are most likely related to the hygiene, segregation, handling, and temporary storage of waste. Hence, to assist the hospitals in decision making there are four key decision points, i.e. D1, D2, D3, and D4, have been mentioned in the developed theoretical decision support framework i.e. Figure 1. Similarly, the four key decision making points for healthcare waste disposal firms, i.e. D5, D6, D7, and D8, which include the selection of a location for establishing a waste disposal plant, network design for waste collection,its capacity planning, and process selection for disposal, have been mentioned in Figure 1.

In practice, the eight vital decisions which have been highlighted in Figure 1are most likely taken in dynamic multi-criteria scenario of decision making. The decisions D1, D2, D4, D5, and D7 are completely taken based on multi-criteria focused analytical modelling. The Decisions D3, D6, and D8 would be best achieved using the hybrid of statistical, multi-criteria, and mathematical modelling.

Apart from hospitals and healthcare waste disposal firms, the third party which is responsible for the management of healthcare waste is pollution control board. The pollution control board monitors the situation of waste management in hospitals on the basis of the guidelines provided by government.As discussed, the ministry of environment and forest in India formulates the rules and policies related to healthcare waste management. The pollution control board of India helps in implementing the policies for better healthcare waste management.The decision support framework developed in this study vividly helps the ministry and pollution control board for making and implementing policies in a more effective manner. The comparative assessment model developed for taking decision D2 would immensely help the pollution control board in overcoming its manpower deficiency problem and correct assessment of waste disposal of hospitals. Similarly, the model developed for taking decision D5, i.e. the selection of an appropriate healthcare waste disposal plant location, would help the ministry in formulating the policy related to location requirements for establishing a waste disposal plant.

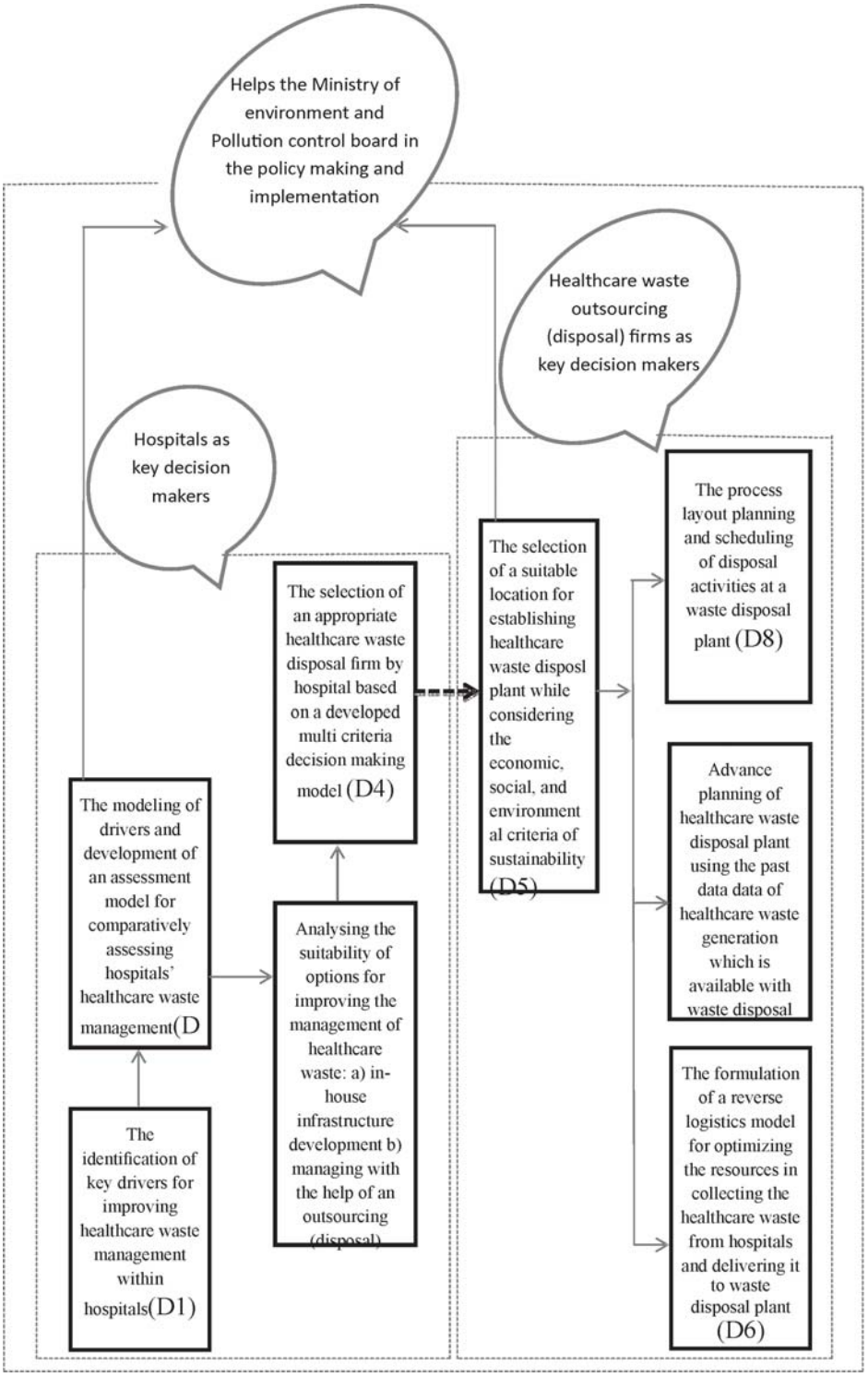


Figure 1: A theoretical decision support framework for addressing healthcare waste management issues in developing countries

Conclusion

The proposed decision support framework which is based on multiple criteria provides a line of action for hospitals and healthcare waste disposal firms for the effective management of healthcare waste in an economically, environmentally, and socially sustainable manner in developing countries. Since, the eight key decision points which have been highlighted in Figure 1 are majorly based on multiple criteria; therefore, the implementation of the above proposed framework would be very effective and sustainable for decision makers. With the help of the proposed framework, the key decision makers would be benefited in terms of saving on financial resources and time, overcoming manpower inadequacy, creating positive word of mouth, and improved social acceptability.The implementation of the proposed framework by hospitals and waste disposal firms could be proved as a self-acting algorithm in diminishing the complaints of public regarding environmental issues generated from the activities related to healthcare waste disposal. The increased level of public satisfaction, especially in terms of environmental matters, inevitably shows a win-win situation for public as well as administration.

Implications of the Study

The research objectives identified and discussed for addressal with the help of different multi-criteria, optimization, and statistical modelling would be very beneficial from the perspective of society, environmental bodies, hospitals, and other stakeholders. The proposed decision support framework is a complete solution for the typical issue of healthcare waste management in India. On one side this decision support framework is complete and capable in terms of protecting the environment and society; whereas, on the other side it shows the path for the development of a successful business model from this type of neglected & loss making businesses. With this, not only the hospitals and healthcare waste disposal firms business strategies would become profitable but also their operations would become proficient and lucrative to attract positive public attention.

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Knowledge Management Performance Measurement: Systemization of Literature for Development of a Scale

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Abstract

Purpose: *This paper aims to address the lack of comprehensive studies for measuring the performance of knowledge management (KM) practices, factors and processes within an organization. It aims to propose an exhaustive knowledge management performance measurement (KMPM) model for the above stated purpose.*

Design/Methodology: *A review of literature on knowledge management has been conducted and analyzed to present a set of 13 constructs.*

Findings: *The proposed constructs can serve as a reference for KM researchersand create a useful survey instrument for assessing KM performance of an organization.*

Research limitations/implications: *The constructs have to be validated empirically.*

Practical Implications: *This study would provide better understanding on KMPM and also serve as a guideline to measure KM performance. Academicians can use it to create a measurement instrument and enhance its scope by applying empirical methods.*

Originality/ Value: *This study is an attempt to present a comprehensive evaluation model for KM in the Indian scenario. Limited amount of research, to our knowledge, has brought-out such an exhaustive list of constructs to measure KM performance.*

Keywords: Knowledge management, Performance measurement, Measures, Constructs.

Introduction

Organizational performance is dependent on a number of people and process factors acting within the organization.Theywork in tandem with each other in order to achieve desired organization goals. The people resource puts other resources to good use by developing and implementing ideas and practices within an organization. Also, proper storage, dissemination and usage of old successful business practices and knowledge attained, along with development of new knowledgeare also vital for the success of an organization. Knowledge, as an organizational resource,has emerged as an ineluctableimportant organizational resource and its importance has grown across various sectors and industries. In order to ensure success of KM in an organization, it is imperative to evaluate its performance so that decisions on what to keep, what to improve and what to discontinue can be taken (Andone, 2009).

KM is a widely used and researched concept. It has been widely investigated across contexts (Miozzo, et al., 2016), industries(Bigliardi Galati and Petroni, 2014) and countries (Mertins, Heisig

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and Vorbeck, 2001). However, KMPMis a complicated process and not easy to implement (Kluge et al., 2001). Even though various models have been proposed, none of them addresses the entire set of KM initiatives that an organization may adopt. Some focus only on KM practices while others discuss KM processes. Thus, the purpose of this study is to propose a KMPM model and present to the reader an exhaustive list of constructs and items for constructing a scale for measurement of the same.

The paper begins with an overview on KM and KMPM. The next section presents the KMPM model followed by the presentation of constructs and their items. The paper culminates with a discussion on the usage of these constructs and ends with a conclusion.

1. Introduction

The field of KM and OP has received attention from both researchers and practitioners alike in the last two decades. The contribution of the knowledge worker to the knowledge economy has fueled this interest. Knowledge is, now,recognized as a crucial resource for any organization.It is widely acknowledged as a tool for sustaining competitive edge. Developing and maintaining KM is considered important for long term survival and success of an organization. Organizations are implementing various KM initiatives to gain an advantage over competitors. Under conditions of fierce competition, globalization and rapid innovation, KM and its implications are vital for achieving success in business (Zack et al., 2009). KM has a profound effect on the various aspects of business performance. Generally knowledge can be divided into tacit and explicit. Explicit can be codified and shared, whereas tacit is informal and skill based which cannot be easily shared with others. This knowledge helps the organization to have business competitiveness and innovativeness. Hence it becomes imperative to measure the KM initiatives and their effect on business performance.

KMPM is vital after the implementation of KM initiatives as it enables organizations to keep track of where they are going and where they want to go. It helps top management in taking right decisions at the right time and also implement changes if required. It is through KMPM that managers get confidence that they are moving in the right direction (Wong, 2005; Chong et al., 2011).

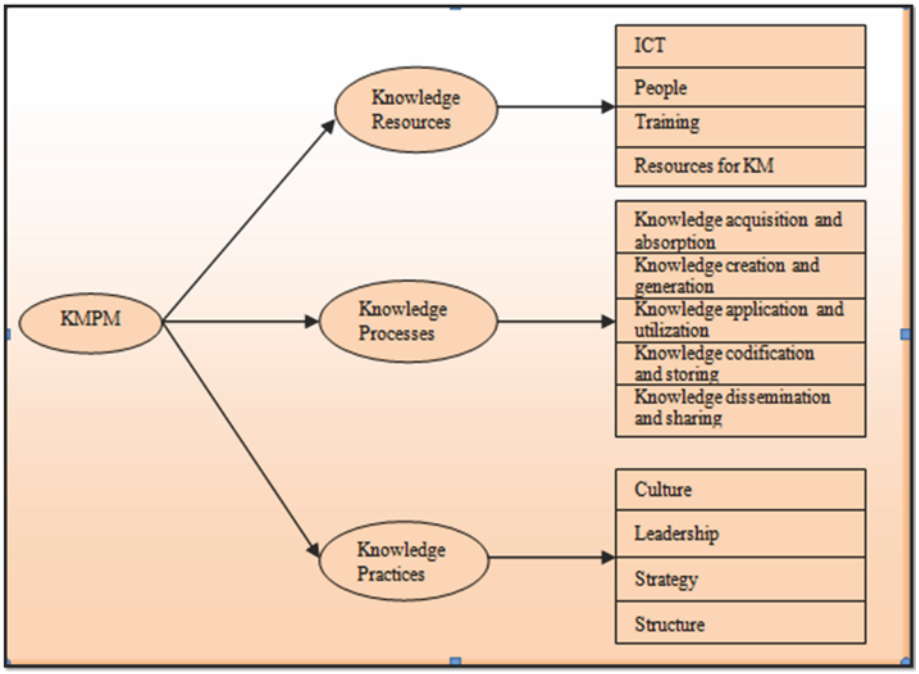
Based on the review, it is argued that there is a need for a comprehensive KMPM model which covers majorly all the KM initiatives and organization can undertake so that a complete picture can be drawn. This paper will present an exhaustive list of KM constructs and items, drawn from literature,which will be extremely helpful in creating a scale for KMPM.

2. Research Constructs

Since the introduction of the concept of KM, numerous researches have been conducted and the concept per se has developed and diversified into different dimensions. Yet, KM practices remain vague and ambiguous. Different researchers have used different nomenclature to define and describe the KM constructs. A thorough literature review on this subject has shown that most of the research in this field can be categorized into three broad themes - knowledge resources, KM processes and KM practices.

Knowledge resources are the knowledge assets owned by the company. It is with the help of these assets that an organization is able to create a unique position for itselfand enjoy an edge above itscompetition (Davenport et al., 1998). KM processes refer to the activities of acquisition, creation, utilization etc. KM practices such as culture, structure, strategy etc. are the factors which act as facilitators for enhancing KM activities within an organization.

After analyzing the literature for KMPM, a framework for has been created and proposed. Accordingly, when we talk about measuring performance, metrics need to be developed on the above mentioned framework. This section will present the measurement constructs of KM resources, KM processes and KM practices along with the items developed by the authors based on a comprehensive study of the literature.Inclusion and measurement of each construct will also be elaborated further.



Source: Compiled by authors

Figure 1: KMPM model

2.1 KM resources

According to OECD (1993), these are the intangible assets of an organization. Davenport et al. (1983) states that these knowledge resources make an organization competitive and organizations should protect them in order to gain an edge over competitors.Knowledge resources refer to the knowledge assets that an organization possesses – it may be tacit or explicit, internal or external. Information and communication technology resources act as essential enablers for the development and sharing of important knowledge within and across systems(Alavi and Leidner, 2001; Gold et al, 2001; Hsieh et al., 2002; Lee and Choi, 2003; Moffett et al., 2003; Chong and Choi, 2005; Wong and Aspinwall, 2005; Zack et.al., 2009; Andreeva and Kianto, 2012**)**. We have classified Information and communication technology (ICT), People(Human Resource Management), Training, and Resources for KM under this head.'People' refers to the human resource in an organization. They are the knowledge resources as all the skill, talent, know-how and abilities lie in them; one of the most vital areas of KM is the management and proper utilization of this resource (Marques and Simon, 2006; Priesto -Pastor et al, 2010, Jain and Moreto, 2015)

2.1.1 Information and Communication Technology

ICT is an important enabler of organization knowledge processes. Since the beginning of KM systems, researchers have argued that ICT systems are an integral part of successful and effective KM systems. It has been written time and again that information and communication technology are crucial and achieving and maintaining sustainable competitive advantage. For creating a scale for measurement of ICT, constructs from items from Davenport and Klahr (1998), Greco (1999), Tynan (1999), Wenger and Snyder (2000), Choi(2000),Alavi and Leidner (2001), Gold et al (2001), Hsieh et al. (2002), Lee and Choi (2003), Moffett et al. (2003) were adopted to understand how organizations used ICT tool and what effect were these tools having on the business performance. Some items were inspired fromChong and Choi (2005),Wong and Aspinwall (2005), Zaim et.al. (2009), Valhoahmaddi, 2010 and finally Andreevaa nd Kianto (2012) was also referred to create the following:

Table I: ICT

IT and ICT support	Davenport and Klahr, 1998; Greco, 1999; Wenger and Snyder, 2000; Choi, 2000; Alavi and Leidner (2001),Gold et al, 2001; Hsieh et al., 2002; Lee and Choi, 2003; Moffett et al., 2003; Chong and Choi, 2005; Wong and Aspinwall, 2005; Andreeva and Kianto, 2012
KM system and Tools	
IT infrastructure	
IT integration with the KM strategy	

Source: Compiled by authors

2.1.2 People (Human Resource management)

Foot and Hook (2008) defined HRM as the management of organization's employees. It is about managing the Knowledge worker, hence the close association between HRM and KM. According to Hansen et al.(1999) and Hislop (2003), HRM policies play a significant role in aligning employee efforts with knowledge strategy of an organization.Human resource management (HRM) is a complex measure of smaller sub-constructs to create a complete picture of the construct 'people'. Lee and Choi (2003) and Marques and Simon, 2006 have discussed 'task orientation' as an important aspect of HRM. Based on conceptual frameworks from Bhatt (2000), Choi (2000), Binney (2001); Hall (2001), Ryan and Prybutok (2001), Moffett et al. (2003); Wong and Aspinwall (2004) ; Hung et al.(2005), Chong and Choi (2005); Hung et al, (2005) and Marques and Simon(2006), constructs on 'employee participation, empowerment and satisfaction' are created.Marques and Simon (2006), Valhoahmaddi (2010); Priesto - Pastor et al (2010), Jain and Moreto (2015) have studied the importance of rewards and knowledge processes into consideration, on the basis of whichconstructs have been drawn. Succession planning, training and skill orientation and lastly team work are the other sub-constructs based on Bontis (2000); Garavan et al.(2000), Mentzas (2001), Horak(2001), Yahya and Goh (2002), Hwang (2003), Moffett et al.(2003); Hung et al. (2005), Chong and Chong (2005), Wong and Aspinwall (2005), Akhavan et al. 2006; Chong (2006), Akhavan and Jafari (2006), Bozbura (2007), du Plessis (2007); Jafari et al.(2007); Priesto -Pastor et al, (2010).

Table 2: People (Human Resource Management)

Task orientation	Lee and Choi, 2003; Marques and Simon, 2006
Employee participation, empowerment and satisfaction	Bhatt, 2000; Choi, 2000; Binney, 2001; Hall, 2001; Ryan and Prybutok, 2001; Moffett et al., 2003; Wong and Aspinwall, 2004; Hung et al., 2005; Chong and Choi, 2005; Marques and Simon, 2006
Rewards and knowledge processes	Marques and Simon, 2006; ; Priesto- Pastor et al, 2010, Jain and Moreto, 2015
System of Mentoring, Training and Skill orientation	Bontis and Giradi, 2000; Garavan et al., 200 7; Mentzas et al., 2001; Horak, 2001; Goh, 2002; Yahya and Goh 2002; Hwang, 2003; Moffett et al., 2003; Hung et al., 2005; ; Chong and Choi, 2005; Wong and Aspinwall 2005; Akhavan et al. 2006; Chong 2006; Akhavan and Jafari 2006; Bozbura 2007; du Plessis, 2007; Jafari et al. 2007; Priesto -Pastor et al, 2010.
Succession planning	Bontis, 2000
Team workand collaborative problem solving	Chong, 2006, Geraint,1998; 1998; Ryan and Prybutok, 2001; Moffett et al., 2003; Choi, 2000; Chong and Choi, 2005; Civi, 2000;Haas and Hansen, 2005

Source: Compiled by authors

2.1.3 Training

As pointed out by Robbins, Judge and Campbell (2010), competent employees need continuous skill enhancement to remain competent. Training helps bridge the gap between present and required skill set of the employees, hence contribute to knowledge creation (De Winne & Sels, 2010) and enhancement of human capital (Capello-Medina et al., 2011). According to Jiang et al. (2012), training can help to enhance the creative thought process of employees. The measures for training and development have been selected after a careful analysis of research papers ranging from Greengard, 1998 to Kianto, Saenz and Aramburu, 2017.

Table 3: Training

Formal training methods	Cohen and Backer, 1999; Choi, 2000; Garavan et al., 2000; Horak, 2001; Mentzas et al. 2001; Yahya and Goh, 2002; Hwang, 2003; Moûett et al., 2003; Moffett et al., 2003; OECD research, 2003; Chong and Choi, 2005; Wong and Aspinwall, 2005; Chong, 2006; Hung et al., 2005; Marques & Simon, 2006; Bozbura, 2007; Valhoahamaddi, 2010; Robbins, Judge and Campbell,2010; Gilbert, De winne&Sels, 201; Campello-Medina et al., 2011, Rahman et al. 2013, Donate and Gaudamillas, 2015, Kianto, Saenz & Araburu, 2017.
Informal training methods	
Competence Development	
Continuous Development	
Training on KM systems and tools	

Source: Compiled by authors

2.1.4 Resources for KM

According to Wong (2005), the availability of resources in an organization is important as it governs the quality and quantity of efforts which can be spent on KM. Lack of resources can

become an obstacle for achieving effective KM.Dedicated set of resources in terms of financial, human and time are inevitable for successful KM implementation.

Table 4: Resources for KM

Financial resources	Holsapple and Joshi, 2000; Davenport and Volpel, 2001; Wong and Aspinwall, 2004; Chong, 2006; Valhoahmaddi, 2010
Human resources	
Technical resources	

Source: Compiled by authors

2.2 KM processes

KM processes have been introduced and implemented in organizations for a long time. This has interested researchers and many KM processes have thus been identified and studied. These processes try to relate the two types of knowledge - tacit and explicit (Nonaka and Takeuchi, 1995; Davenport and Prusak, 1998; Civi,2000).

Knowledge acquisition and retrieval is the process of obtaining knowledge essential to perform the job duties and responsibilities. It can be obtained from knowledge repositories of the organization. Employees may also acquire knowledge by attending seminars, workshops etc.

Knowledge internalizationrefers to the process of imbibing the acquired knowledge and converting it into tacit form. Knowledge creation and generation occurs when employees not only learn to apply these skills in their regular day to day activities and duties, but also develop new knowledge in the form of patents and development of best practices. When this knowledge is applied in the form of implementation of best practices and new product development, it gives the organization a competitive edge. The process of codifying this set of knowledge and storing it in the form of databases, repositories, archives etc. that can be easily accessed by employees is the next step. Knowledge dissemination and sharing takes place when employees start transferring knowledge to each other through seminars, workshops, mentoring programs etc. Table V provides the list of authors whose studies have been referred to in order to understand the development and nomenclature of the KM processes.

Table 5: KM Processes

Knowledge acquisition and retrieval	Arora, 2002; Lee et al.,2005; Shannak, 2009; Andone,2009; Liao and Wu, 2009; Kuah and Wong,2011
Knowledge internalization	Ahn and Chang,2004; Lee et al., 2005
Knowledge creation and generation	Azzone et al.,1991; Kaplan and Norton, 1998; Martin, 2000;Arora, 2002; Ahn and Chang,2004; Chen and Huang, 2009, Kuah and Wong, 2011
Knowledge application and utilization	Lee et al., 2005; Andone, 2009; Liao and Wu,2009; Kuah and Wong, 2011.
Knowledge codification and storing	Arora, 2002; Jennex and Olfman, 2004;Lee et al. 2005; Andone, 2009; Kuah and Wong, 2011
Knowledge dissemination and sharing	Gooijer (2000); Arora (2002); Ahn and Chang (2004); Lee et al. (2005); Shannak (2009); Liao and Wu (2009); Kuah and Wong , 2011

Source: Compiled by the authors

2.3 KM practices:

KM is a step by step process; it starts with an organization's long term vision. In order to make the KM resources, processes and practices effective, systems and processes have to be compiled to capture and apply knowledge from internal or external stakeholders. These systems need to be in place and it can be achieved by adopting the right measures for culture, leadership, strategy, structure, assessment of KM initiatives and knowledge from, for and about the customer.

2.3.1 Culture

Culture as a construct has been studied by various researchers over the last two decades. Organizational culture can be defined as a shared set of assumptions that an organization has leant while adjusting in its environment to solve problems posed by its external environment and internal conditions whichare passedfrom old employees to new ones. Each organization has itsunique culture, which has developed over a long period of time. Culture explains the knowledge that should be valued and kept in an organization. This construct has been studied for a long time and hence the numbers of studies conducted on culture are numerous (Gold et al., 2001; Lee and Choi, 2003; Anantamulla, 2007; David and Fahey, 2000; Appelbaum et al. , 2014; Lee, Shiue and Chen, 2016).It is a complex and multifaceted construct to study hence it has been divided into sub- constructs i.e. support and collaboration, trust, focus on learning and innovation, benchmarking and knowledge sharing, open and improved communication, social aspects of culture and approach towards knowledge elaborated in Table 6.

Table 6: Culture

Collaboration, Alliances and Support	Skyrme and Amidon, 1997; Davenport et al., 1998; Greco, 1999; Liebowitz, 1999, APQC, 1999; Ryan and Prybutok, 2001; McDermott and Dell, 2001; Wild et al., 2002; Hassanali, 2002; Moffett et al., 2003; Lee and Choi, 2003; Wong and Aspinwall, 2005; Al-Busaidi and Olfman, 2005; Hung et al., 2005; Akhavan et al., 2006; Chong, 2006; Bozbura, 2007; du Plessis, 2007; Anantamulla, 2007; Basu and Ray, 2014; Appelbaum et al. , 2014, Jain amd Moreno, 2015, Lee, Shiue and Chen, 2016
Faith, Trust and Social Capital	Davenport et al. 1998; Greco, 1999; David and Fahey, 2000; Ryan and Prybutok, 2001; Wild et al., 2002; Moffett et al., 2003; Bozbura, 2007; Hung et al, 2005; Appelbaum et al. , 2014; Gold et al., 2001, David and Fahey, 2000; Shu Mei Tseng, 2010; Basu and Ray, 2014
Learning, Development and Autonomy	Skyrme and Amidon, 1997; Davenport et al., 1998; Greco, 1999; Liebowitz, 1999, APQC, 1999; Ryan and Prybutok, 2001; McDermott, 2001; Wild et al., 2002; Hassanali, 2002; Moffett et al., 2003; Lee and Choi, 2003; Wong and Aspinwall, 2005; Al-Busaidi and Olfman, 2005; Hung et al., 2005; Akhavan et al., 2006; Chong, 2006; Bozbura, 2007; du Plessis, 2007; Basu and Ray, 2014; Marques and Simon, 2006; Zaim, 2009; Appelbaum et al. , 2014; Basu and Ray, 2014; Lee, shiue and chen, 2016
Knowledge Sharing and Benchmarking	David and Fahey, 2000; Wong and Aspinwall, 2005; Anantamulla, 2007; Shu Mei Tseng, 2010
Open and Improved communication	David and Fahey, 2000; Wong and Aspinwall, 2005; Anantamulla, 2007; Shu Mei Tseng, 2010
KM orientation	Gold et al., 2001, Lee and Choi, 2003; Anantamulla, 2007; David and Fahey, 2000; Appelbaum et al. , 2014; Lee, shiue and chen, 2016

2.3.2 Leadership

According to Asoh et al. (2002), leadership is a critical success factor for KM success. They also suggested that Leadership in an organization should support Knowledge sharing, learning environment and employee development. Similar to this study, other research studies (Di Tienne et al., 2004) have stated that KM has shifted its focus from technology to people and good leadership can help focus on creating a culture of trust, collaboration and knowledge sharing (Hasanali, 2002; Liebowitz, 1999; Holsapple and Joshi, 2000; Choi, 2000; Civi, 2000; Ryan and Prybutok, 2001; Pemberton et al., 2002; Kalling, 2003; Moûett et al., 2003; Ribiere and Sitar, 2003; Chong and Choi, 2005; Hung et al, 2005). For the same reason, leadership has been considered as an important attribute and included in the study. Table 7 provides a list of key items used to measure the construct leadership and its support to the KM initiatives of an organization.

Table 7: Leadership

Top Management as role model	Skyrme and Amidon, 1997; Davenport et al., 1998; Abell and Oxbrow, 1999; American Productivity & Quality Center (APQC), 1999; Hasanali, 2002; Liebowitz, 1999; Holsapple and Joshi, 2000; Choi, 2000; Civi, 2000; Ryan and Prybutok, 2001; Pemberton et al., 2002; Kalling, 2003; Moûett et al., 2003; Ribiere and Sitar, 2003; Chong and Choi, 2005; Hung et al, 2005; Wong and Aspinwall, 2005; Al-Busaidi and Olfman, 2005; Chong, 2006; Akhavan and Jafari, 2006; Akhavan et al., 2006; Jafari et al. ,2007; du Plessis, 2007; Chong, 2006; Anantamulla, 2007; Donate and Pablo, 2014
Management support to KM initiatives	
Managers tolerance for mistakes	
Documentation of KM policy and rules	

Source: Compiled by authors

2.3.3 Strategy

Liebowitz (1999) said that one of the means for driving the success of KM is to have a clear and well-defined strategy. This would provide a foundation for an organization to deploy its resources and capabilities in the correct direction. There is a clear agreement in the literature that KM initiatives in the organization should be drawn from and well connected to enterprise business strategy.

Table 8: Strategy

Aligning with organizational strategy	Skyrme and Amidon (1997), Davenport et al. (1998), Liebowitz (1999), (APQC) (1999), Zack (1999), Wong and Aspinwall (2005), Akhavan et al. (2006),du Plessis (2007)
Common Vision	
Clarity of objectives	

Source: Compiled by authors

2.3.4 Structure

Though there is no specific structure suggested for KM, some scholars suggest a complete re-design for KM (Malhotra, 2000), whilemajorly don't think it necessary. However, there is an

agreement on low on centralization and formalization for a structure if KM needs to effective. KM literature clearly points that instead ofhighly centralized and controlled rigid hierarchy, flexible and decentralized organizational structures are recommended in the KM literature. Structure is an essential part to study the organization's value creating process. Our study includes three key structural factors i.e. centralization, formalization and integration.Table IX presents a set of items to measure appropriateness of structure of an organization.

Table 9: Structure

Centralization and empowerment	Davenport and Klahr, 1998; Greco, 1999;Tynan, 1999; Choi, 2000; Wenger and Snyder, 2000; Hsieh et al., 2002; Moffett et al., 2003; Gold et al, 2001; Lee and Choi, 2003; Chong and Choi, 2005; Hung et al, 2005; Zaim et al, 2007
Formalization and team spirit	
Integration	

Source: Compiled by authors

3. Conclusion

From the literature study on measurement tools and techniques developed for KMPM, we find that the early measures aimed at measuring knowledge resources more than other elements. Slowly diversification occurred in the process and KM processes were included. Number of researches held in this filed also increased, new theories were introduced, but here doesn't exist a standard format for KMPM, the performance areas that are evaluated depend mostly on the scope of research and ability of the model created.

Many researchers have used qualitative case analysis for understanding the effect of KM implementation in an organization. Qualitative techniques give freedom to the researcher to conduct an in-depth study of certain variables. Quantitative analysis uses statistical or mathematical models. This kind of analysis provides high level of precision in measurement. In our view, both the analysis should be used as both have their own advantages and can lead to better analysis.

During the review another point that has been noted is that very few techniques have the ability to measure KM performance both within the organization and also in comparison to the industry. We have seen that benchmarking the performance of an organization against its competitors in not viable due to the use of different techniques. In the absence of a standard universal measurement tool, no comparison in the effectiveness of KM can be performed across organizations.

The above presented framework has been generated after a critical analysis of the KM literature and this paper is believed to be a comprehensive study that covers most of the important KM measures and tools.Through the development of the above, we have tried to provide the KM researchers with a comprehensive and exhaustive list of measures for resources and practices to help create an instrument for study. This above developed framework can be used to create a standard questionnaire which can be tested for reliability and validity as the coverage of KM resources, KM processes and KM practices along with their sub-constructs and items is quite extensive.

This framework has both managerialand theoretical implications. It can help managers create a measurement instrument customized to their needs. For academicians, it furnishes a strong foundation for KMPM and enriches their knowledge to comprehend specific areas of KM in a better manner.

Finally, knowledge and its management have been given a lot of importance in the Indian scenario. The country has been laying stress on the importance and benefits of knowledge and its application for the development and betterment of the society at large. So this study becomes more relevant for developing countries like India that have put knowledge on the forefront in order to attain a position for themselves in the world economy.

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A Generalized Model of Flexibility MeasurementUsing Business Environmental Factors and Flexibility Enablers

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Abstract

The ability to cope up with the uncertain environment is shaped by organizational flexibility. The flexible organizations sustain the competitive advantage over the period of time. The flexibility in different context essentially induces speed and agility in organizational processes. The flexibility evaluation mechanism will help organizations to measure and enhance the organizational flexibility. This study proposes generalized flexibility evaluation mechanism demonstrated by an example of workforce flexibility measurement by analyzing the impact of flexibility enablers and business environment. The workforce flexibility contributes significantly to versatility, responsiveness, and the ability of employees to move between jobs. The flexibility evaluation mechanismsavailable in the literature are industry, organization, and context-specific and not generic in nature and ignore the impact of the business environment.

Introduction

Flexibility enables the organizations to faster achieve the desired objectives and cope up with internal and external changes. The flexibility measurement techniques quantify the select flexibilities for making organizational strategies for competitive advantage. This paper identifies various types of flexibility measurement techniques available in literature and proposes a measurement framework which can be applied across industries by analyzing the impact of the interaction between flexibility enablers and business environment. The business environment is used in this paper as flexibility is the predictor of performance in a dynamic business environment (Anand and Ward 2004). Some of these methods examine the outcome of flexibility while other examines sources of flexibility for making an assessment of organizational flexibility. Following five categories of measurement techniques of flexibility are identified from the existing literature.

A) Broad Categorization of Flexibility

In this category, the organizational flexibility is put in different broad categories with a provision of gradation. Garavelli (2003) categorized supply chain flexibility in three categories i.e. no flexibility, limited flexibility and total flexibility. The flexibility aspects were mainly related to the performance of an organization. Verdu et al. (2009), proposed four types of managerial flexibility: internal and external, structural and strategic.

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B) Flexibility Measurement Using Mathematical Formula

In this case, various formulae are proposed for measurement of select flexibilities. The operational means are defined to understand the impact or outcome of flexibility. Beamon (1999) used output volumes, the percentage of the slack time, delivery time, number of different product types for measuring volume, delivery, and mix flexibilities. The capacity and load flexibility for manufacturing systems are measured by Teich& Claus (2017). However, mapping of the physical characteristic of the production system and quantification of manufacturing flexibility is difficult due to lack of methods for the synthesis of the functional parameters (Kahraman et al. 2004). Tsourveloudis (1998) used fuzzy logic to measure manufacturing flexibility. A rule-based flexibility evaluator has been demonstrated through prototype by Das and Caprihan (2008). Zhang et al. (2017) formulated measurement of process flexibility of product design by considering requirement variations. Tsai et al. (2017), used entropy-based and Taguchi quality loss for flexibility measurement.

C) Measurement Based Upon Sources and enablers of Flexibility

The enablers or sources of flexibility are examined for measuring flexibility. The example can be seen in work of Lin et al. (2006)[2] who proposed Fuzzy Agility Evaluation Method (FAEM) by examining business operation environments, agility drivers, and supply chain capabilities. Lee and Xia (2005) developed team flexibility measurement using capability and socio-technical perspective. Gligor et al. (2013) devised measures of supply chain agility based on swiftness, alertness, accessibility, and decisiveness. Kandemir and Acur (2012) used the resources, capabilities, and performance to frame strategic decision-making flexibility.

D) Index Based Weighted Measurement

The index based weighted flexibility measurement has used by many authors wherein Likert type scales were used. *Swafford et al. (2008)* measured each function of supply chain on this scale. Agility evaluation index isused by *Yang and Li (2002).*

E) Measurement of Flexibility through Assessment of Organizational Output

In this category the outcome due to organizational flexibility is examined. Thisincludes observation of visible characteristics of flexibility. *Lin et al(2006)*[1] have introduced fuzzy principles to evaluate the agility of an organization based upon performance and importance of agile capabilities. *Gong (2008)* suggested analytical models describing relationships between the degree of flexibility in a system and the system level performance. Ganguly et al. (2009) have proposed measurement of agility using market share, responsiveness and cost effectiveness. The study done by Sheffield et al. (2012) has identified the factors indicative of software development agility in the organization. Rastogi et al. (2016), indicated the flexibility as predictor of work family enrichment. The association between firm performance and HR flexibility is demonstrated by Sekhar et al. (2016).

It can be seen from literature review that flexibility measurement has taken progression from basic categorization of flexibility to fuzzy measurement of different types of flexibilities.

Methodology

The Flowing stream strategy by Sushil (2012, 2013)has been used in this paper for providing theoretical support to flexibility measurement method used in this paper. This frameworkcompares characteristic of flowing stream with organizational growth. This framework is used for identifying different types of forces acting on organization.In framework of “Flowing Stream Strategy” the major forces that pull the organization towards its continuity are: core ideology, customer base, infrastructure, technology, core competence, brand, supply chain and distribution network, culture and performance. The major forces that push the organization towards change are: globalization,

new opportunities, competition, changing customer needs, new technology, e-business, mergers and acquisitions, government policies and legislation and environmental concerns. For the purpose of study of organization, the combinations of continuity and change forces are mapped on a continuity-change assessment matrix. The result of assessment is further used for measuring flexibility.The flowing stream strategy operates under seven guiding principles. These principleslay emphasis on strategic changes by leveraging the benefits of the continuity in a dynamic manner. The underline methodology behind framework and its principle gives enablementof flexibility. Toachieve next level of performance, organization requires creative discontent with the present situation and desired change is enabled by flexibility. The organizations have to show flexibility to incorporate opposite options. During organizational growth the energy is drained and it needs to be continuously vitalized. The organization encounters a number of hurdles on the way and finds its way by circumventing these hurdles by using suitable flexibility. The usage of four key strategic channels divert, shift, partition and integrate requires flexibility by organization.The proposed measurement framework of flexibility requires identification of various forces acting on organization which is identified as flexibility enablers. The visual depiction is made in Figure 1 for impact of business environment, flexibility enablers on organization. The entire process of flexibility evaluation using example of workforce flexibility has been described in four steps.

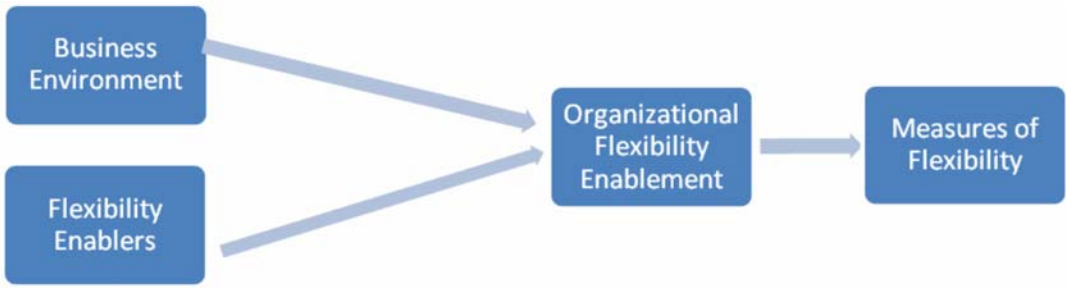


Figure 1: Interaction among business environment and flexibility enablers

Step-1.Identification of Business Environmental Factors Impacting Flexibility

Twenty business environmental factors impacting flexibility are identified using framework of Flowing Stream Strategy(Sushil2012, 2013). These are major continuity and change forces acting on organization for inducing flexibility.

I. Impact of Globalization
II. New opportunities
III. E – Business
IV. Competitors
V. Mergers and Acquisitions
VI. Government policies and legislation
VII. New technology (Software/ Hardware)
VIII. New technology (Method)
IX. Environmental concerns

X. Economies of scale

XI. Growth of niche market

XII. Increasing rate of change in product models

XIII. Increasing pressure on cost

XIV. Product lifetime shrinkage

XV. Rapidly changing market

XVI. Increasing pressure on cost

XVII. Quicker delivery time

XVIII. Quick time to market

XIX. Increasing quality expectation

XX. Increasing pressure of global market

Step-2. Identification of Enablers of Flexibility within Organization

Within given business environment, there are enablers present in the organization which induces the flexibility. The workforce flexibility in information technology (IT) industries plays major instrument of growth. Workforce flexibility and corresponding enablers are utilized from study done by *Yusuf et al (1999)* as agile capabilities. Ten such enablers to induceflexibility are listed below.

I. Integration

II. Competence

III. Team building

IV. Technology

V. Quality

VI. Change

VII. Partnership

VIII. Market

IX. Education and skill upgrade

X. Welfare

Step-3. Computing intensity of continuity and change forces

The questionnaire is prepared to make an assessment of environment (external and internal), continuity and change forces acting on an organization. The key concerns of assessing continuity and change forces for designing the questionnaire are listed below.

- Overall level of understanding of the goals within the organization.
- Benchmarks for the planned progress
- Additional enterprise-wide support needs for change
- Best practices from other organizations.
- Planned actions

- Challenges to employees understanding
- Current dynamics of the market place and its impact
- Mechanism to capture signals from customers in advance
- Ways to better understand customer needs
- Key processes being worked on and their selection criteria
- Values enhancement from the customer's perspective
- Leveraging the strengths of enterprise
- Economies of scale are being realized
- Relative intensity of continuity and change forces

Step-4. Measurement of Select Flexibility

A matrix is prepared to show the strength of interaction between forces i.e. business environment and applicable flexibility enablers in an organization. The relevant flexibility is derived from these assessments.

Overview of Case Organization

The company A has started from scratch when the information technology hardly existed in India. Currently, it has employee strength of more than 1 lack. It put enlightened approach to employee development and provides people whatever they need to succeed, be it a virtual assistant or talent transformation sabbaticals, expert guidance or fast track growth, inner peace or democratic empowerment. It's range of offerings span product engineering, technology and application services, BPO, infrastructure services, hardware, systems integration, and distribution of technology and telecom products. The organizational is constantly trying to be the most preferred and significant software and engineering led global IT services provider in chosen markets. The organization promotes entrepreneurial behavior. This enables to handle rapid changes in the environments and technologies.

Results and Discussion

The operationalization of method for measuring workforce flexibility has been demonstrated for case organization in this section. The rationale for the impact of enabler on the environment is explained below for work force flexibility. If the environment impacts the enabler, then value "1" is assigned to the matrix cell given in Table 2.

I. Impact of Globalization: It is forcing organizations to adopt for workforce flexibility. The workforce flexibility is enabled by current practices in the organization like the concurrent execution of activities, multi-venturing capabilities, individuals working in cross-functional and team across company borders, decentralized decision making, technology awareness programs, strategic relationship with customers and suppliers, new product introduction etc. The impact of globalization touches all enablers; therefore, all the enablers participate in workforce flexibility. Hence enablers like integration, competence, team building, technology, quality, change, partnership, market, education, and workforce skill upgrade are given value "1" in matrix cells given in Table 2.

II. New opportunities: Adoption of new practices and scenarios for new opportunity are enabled by existing skill set. The workforce flexibility is enabled by enterprise integration, information accessible to employees, business practice difficult to copy, the team across company borders, customer satisfaction, response to market changes and supported by other enablers and accordingly marked in Table 2.

III. E-Business: The business environment impacting organization enablers are business practice difficult to copy, cross-functional teams, technology awareness, products with substantial value addition, first-time-right design, response to market changes. The corresponding heads under enabler are integration, competence, team building, technology, quality, partnership, market, and education; these are marked as "1" in Table 2.

IV. Competitors: Stiff competition forces redeployment of resources at the certain point of time and workforce flexibility is enabled. All the enablers participate in this case.

V. Mergers and Acquisitions: Environment and enablers are multi-venturing capabilities, the culture of change etc. The enabler's heads are integration, competence, team building, technology, quality, change, partnership, market, education, welfare and workforce skill upgrade. All these enablers participate in workforce flexibility.

VI. Government policies and legislation: The applicable environment and enablers are enterprise integration, information and welfare measures along with all other enablers. Hence enablers like integration, competence, team building, technology, quality, partnership, market, education welfare and workforce skill upgrade are given 1 in matrix cells.

VII. New technology (Software/ Hardware): It is creating major impact and organization enablers for enabling workforce flexibility are multi-venturing capabilities, technology awareness, skill and knowledge enhancing technologies, short development cycle time, the culture of change, learning organization, multi-skilled and flexible people. Hence enablers like integration, competence, team building, technology, quality, change, partnership, market, education, and workforce skill upgrade are given 1 in matrix cell given in Table 2.

VIII. New technology (Method): It is more related to process and has the similar impact as tools as described in above section of new technology.

IX. Environmental concerns: It induces a major change in organizational business and policies. Hence enablers like integration, competence, team building, technology, quality, change, partnership, market, education, and workforce skill upgrade are given 1 in matrix cells in Table 2.

X. Economies of scale: The applicable enablers, in this case, are the concurrent execution of activities, multi-venturing capabilities, quality over product life, products with substantial value addition, strategic relationship with customers, close relationship with suppliers, new product introduction, customer satisfaction, response to market changes. Corresponding enablers are integration, competence, team building, technology, quality, change, partnership, market, education and workforce skill upgrade which are given 1 in matrix cells.

XI. The growth of niche market: The business practice difficult to copy, empowered individuals working in teams, technology awareness, products with substantial value addition are contributors in this process. The enablers like integration, competence, team building, technology, quality, change, partnership, market, education, welfare and workforce skill upgrade participate for workforce flexibility and given 1 in matrix cells.

XII. Increasing rate of change in product models: The relevant enablers are continuous improvement, customer-driven innovations, response to market changes. The relevant enablers participating in inducing workforce flexibility and given value 1 in the matrix cells given in Table 2.

XIII. Increasing pressure on cost: The corresponding enablers are first-time-right design, short development cycle time supported by all other flexibility enablers. Their equivalents are

given value "1" in matrix cells in Table 2.

XIV. Product lifetime shrinkage: The major enablers are concurrent execution of activities, enterprise integration, information, multi-venturing capabilities, empowered individuals, technology awareness, leadership in the use of current technology, skill and knowledge enhancing technologies, products with substantial value addition , first time right design ,short development cycle time, strategic relationship with customers, customer-driven innovations, customer satisfaction, response to market changes, learning organization, multi-skilled and flexible people. Therefore, all the enablers participate in workforce flexibility and value 1 assigned is assigned to the matrix cells.

XV. Rapidly changing market: A product portfolio variability driven by customer requirement is the business environment and relevant enablers are the culture of change and continuous training and development. All other enablers are effective for inducing workforce flexibility in this case.

XVI. Increasing pressure on cost: Customer expectation for a value of money is the driver for adoption of improved processes. The relevant enablers are concurrent execution of activities, enterprise integration information, multi-venturing capabilities, empowered individuals, technology awareness, leadership in the use of current technology, skill and knowledge enhancing technologies, products with substantial value addition , first time right design ,short development cycle time, strategic relationship with customers, customer-driven innovations, customer satisfaction, response to market changes, learning organization, multi-skilled and flexible people are participating to achieve objectives. All enablers participate in workforce flexibility and assigned value 1 in the matrix except for exceptional decision to compromise on welfare objectives.

XVII. Quicker delivery time: The faster delivery time is a major focus of IT organizations. The variability in technology domains and experience of individual induces multiple skill set in an employee. The risk-taking initiative impacts development schedule which is mitigated with help engineers of different technology domain. The relevant enablers for workforce flexibility, in this case, are organizational training and exposure along with other support mechanisms and other relevant enablers given in Table 2.

XVIII. Quick time to market: All types of enablers are required for timely delivery of products. The workforce flexibility is enabled by leveraging the short development cycle of products.

XIX. Increasing quality expectation: High-quality product delivery requires IT organization to have individuals trained in other areas which are required for integration of products for complete solutions. It involves all enablers support and hence value '1' is assigned to matrix cells.

XX. Increasing pressure of global market: It is a major force acting on organizations to adopt for workforce flexibility due to faster expansion and collaborative work practices. Enablers like integration, competence, team building, technology, quality, change, partnership, market, education and workforce skill upgrade are required in this case for workforce flexibility. The relevant enablers are marked as "1" in Table 2.

Computation of Intensity of Enablers throughContinuity and Change Assessment

The study is carried out to find out various change and continuity factors impacting the organization at this point in time along with the intensity of each factor. All survey items measuring the continuity and change factors given in Table 2 are measured using a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4= agree, 5 = strongly agree).

The higher scores indicate higher levels of each factor. Thirty respondents from case organization "A" working in team leadership and managerial position have completed the questionnaire. The summary of observations is presented in Table 1.

Table 1: Summary of intensity of continuity and change forces

S.No	Continuity and change forces	Average value of factors	Standard Deviation	Average intensity of continuity forces
Continuity Forces Assessment				
1.	Huge customer base	4.45	0.15	4.02
2.	Well entrenched infrastructure	4.41	0.21	
3.	Core competence	3.95	0.21	
4.	Technology	3.36	0.43	
5.	Global supply chain and	2.88	0.34	
6.	Internal Factors	4.80	0.16	
7.	Existing culture	3.42	0.18	
8.	Performance	4.89	0.17	
Change Forces Assessment				
1.	Globalization	3.63	0.29	3.74
2.	New opportunities	3.52	2.1	
3.	Competition	3.86	0.32	
4.	Customer Needs	3.74	0.17	
5.	New Technology	4.02	0.21	
6.	E – Business	3.58	0.19	
7.	Mergers and Acquisitions	3.28	0.34	
8.	Government policies	4.03	0.13	
9.	Internal Factors	4.04	0.25	

The survey has shown the case organization "A" is operating under moderately high change forces and high continuity category. The technology-driven and regulatory driven forces, customer forces are impacting high.

Computation of Workforce Flexibility

The final matrix of enablers and environment are given in Table 2 for measurement of workforce flexibility in the case organization "A". The sum of all enablers in the cell is multiplied by the weight of factors obtained in continuity and change assessment which are listed in the first row of Table 2. The total sum of all enablers is obtained w.r.t maximum score of 1000. The is normalized to the scale of 1. For all enablers and environmental forces whose weighted score is required for measurement of flexibility, the nearest value from continuity and change forces assessment from Table 1 is used if it is not directly available from the questionnaire.

Table 2: Assessment of Workforce Flexibility

Environment of Workforce Flexibility(Industry influence)																					
Weighs of Environmental factors (Organizational influence)		3.63	3.52	3.86	3.74	3.58	3.28	4.03	4.02	4.02	4.03	3.63	3.52	3.74	4.04	3.52	4.04	4.04	4.04	4.04	3.63
Enablers of Workforce flexibility		Impact of Globalization	New opportunities	Competitors	Customer Needs	E – Business	Mergers and Acquisitions activities	Government policies and legislation	New technology (software)	New technology (methods)	Environmental concerns.	Economies of scale	Growth of niche market.	Increasing rate of change in product models.	Product lifetime shrinkage	Rapidly changing market	Quicker delivery time	Increasing pressure on cost	Quick time to market	Increasing quality expectation	Increasing pressure of global market competition
	Integration	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Competence	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Team building	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Technology	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Quality	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Change	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1
	Partnership	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Market	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Education and Workforce skill upgrade	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Welfare	1	1	1	1	0	1	1	0	0	1	0	1	1	1	1	1	0	1	1	1
	SUM of all enablers	10	10	10	10	8	10	9	9	9	10	9	10	10	10	10	10	9	10	10	10
	Sum of all enablers with weightage	36.3	35.2	38.6	37.4	28.6	32.8	36.3	36.2	36.2	40.3	32.7	35.2	37.4	40.4	35.2	40.4	36.4	40.4	40.4	36.3
	Workforce Flexibility weight on scale of 1000	732.6																			
	Workforce Flexibility weight on scale of 1	.7326																			

The Workforce flexibility for case organization is .7326 on a scale of 1 which is on the higher side. The organization is desired by to be competitive. All enablers are interacting with most of the environment factors within the regulatory framework to achieve the desired flexibility.

Conclusion and Future Work

This framework assumes that flexibility in an organization is enabled by the external environment. The framework "Flowing Stream Strategy" captures internal and external change forces needed for flexibility and growth of an organization. To face the changing circumstances while maintaining benefits of existing continuity forces, the flexibility is needed (Adaptation Flexibility, Organizational Flexibility, and Responsive to Target Market Flexibility) in the organization. The intensity of external forces impacts the degree of flexibility. The different combination of continuity (High and low impact forces) and change forces (High and low impact forces) gives the different types of flexibility enablement (Strategic Flexibility, Structural Flexibility, Total System Flexibility, Delivery and Delivery Time Flexibility, Distribution Flexibility, New Product Flexibility, Operation Flexibility, Operational Flexibility, Response Flexibility, State Flexibility, System Flexibility, Adaption flexibility etc.). It also shows interdependence among various flexibilities. It can be seen that various types of flexibilities are required to handle a combination of environmental forces and

organizational factors (Kara et al. 2002). The turbulent business environment has a role in shaping the organizational flexibility (Camps et al. 2016).

The twenty environmental factors described in previous paragraphs are analyzed for impact on Workforce flexibility and corresponding values are indicated between (0-1) based on the relevance of enabler. In the ideal case of all enablers are present for all types of flexibilities gives 100% flexible organization w.r.t workforce. The workforce flexibility on a scale of 1 is 0.7326. The indicators for which data is not directly available, the data of closest indicators are used from continuity and change assessment. The various continuity forces in organization show the higher values of 4.02 due customers, infrastructure, and performance related issues. Lower standard deviations are observed for all related indicators. The overall intensity of continuity factors is on higher side due to policy-driven governance and infrastructure availability.

The purpose of this study was to examine interactions among environment and organizational enablers to measure flexibility. This mechanism of measuring given a type of flexibility is important because it is generic in nature and can be applied to all types of flexibility in the other organizations. The framework is generic and can be applied to other types of industries with slight modifications and incorporating factors relevant to the industry but measurement technique will remain same. The factors impacting organizational flexibility have been identified by Jain and Raj (2013). The methodology can be applied to any organization for which continuity and change assessment is available. A number of organizational surveys is needed to fully explore the given methodology. Organization enablers and industry influence factors are kept at ten and twenty at present which can be extended. In the present survey, some of the factors are not directly measured but their equivalent values are taken on assumption that if these values are measured their values will be closer to assumed values. In the matrix cells decision is taken to include and exclude a given parameter by giving binary (0,1) values. The intermediate levels are also required to make this flexibility measurement framework more effective.

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Impact of Components of Globalisation on the Economic Growth in India: An Empirical Study

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Abstract

Globalisation is a multidimensional concept covering three aspects namely, economic, social and political. The present study analyses the impact of the above mentioned three main sub-indices of globalisation (Economic globalisation index, Social globalisation index and Political globalisation index) on the Annual rate of growth Gross Domestic Product (GDPrt) of India. Data collected from UNCTAD and KOF globalisation index (expressing globalisation) has been used for the time span of 46 years (1971-2016), in an econometric model. The results suggest that economic and political globalisation exhibit positive linkages with the GDP growth rates, however social globalisation has a negative impact on the economic growth. The study is relevant to Indian policy makers and managers planning to expand on global frontiers.

Keyword: Economic Growth, Globalisation, Granger Causality, Ordinary Least Square.

Introduction

Globalization constitutes a multiplicity of linkages and interconnections that transcend the nation states. It defines a process through which events, decisions and activities in one part of the world can come to have a significant consequence for individuals and communities in quite distant parts of the globe. (Anthony McGrew,1990).

Defining globalisation is a complex task as it should reflect the multidimensionality of the concept. (Philip G. Cerny,1997) defined globalisation as a set of economic and political structures and processes deriving from the changing character of the goods and assets that comprise the base of the international political economy. Increase in globalisation in reflected by the openness of developing and emerging nations. India being a pertinent fragment of the emerging nations, experienced globalisationand its benefits, facing along with it, the opportunities and threats.

Globalisation has become a part of our lives. Presence of globalisation is witnessed with the ease in access to goods and services manufactured abroad in one's own nation. Globalisation is a convoluted and multidimensional phenomenon which has been affecting every sphere of trade and growth.

The assessment of linkages between globalisation and economic growth has always been seeking attention of various researchers, policy makers and hence it becomes relevant and desirable to assess the impact of globalisation on the economic growth. The relationship between the two is strong and is required to be studied from time to time as it serves as a very crucial issue in framing economic policies for growth and trade.

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Expressing the impact of globalisation on economic outcomes is critical as it is difficult to measure globalisation and further assessing its impact on the different facets of economic growth.The multidimensionality of concept of globalisation has been simplified by Dreher (2006, 2008) suggesting a globalisation index including three sub globalisation indices: economic, social and political indices.

Caselli (2006) also mentioned three similar dimensions of globalisation, however with some differences in the sub-dimensions. The present study used this approach (KOF index) and aimed to highlight the impact of globalisation on the Indian economy, by analysing the effect of economic, social and political indices on economic growth (Real Gross Domestic Product, per capita) during 1971-2016.

No systematic positive or negative relationship of globalisation and economic growth has supported by previous empirical analysis, however it has been believed that globalisation and economic growth are positivelyrelated to each other. It still remains a controversial issue and its net effect still remains puzzling.

The structure of the paper is as follows: Introduction is followed by the review of the relevant literature. The third section of the paper discusses the data and its sources and the methodology undertaken. Further the empirical model is specified followed by the analysis of the findings and discussion on the research implication and is finally concluded with the future scope of extensions.

Literature Review

(Anthony McGrew,1990; Robertson,1992; Albrow,1997;&Guillen, 2001) suggested various definition of globalisation and calling it rather a process leading to greater interdependence and mutual awareness among various units in the world.

(Philip G. Cerny,1997; Caselli,2006; Dreher, 2006,2008) further reflected upon the multidimensionality of the concept and broadly suggested that globalisation can be prorated into the economic, social and political aspects.

(Alesina et.al, 1994; Garrett,2001; Milanovic,2003; Woo,2009; Adit and Gassebner,2010) contributed to literature in assessing the benefits globalisation has brought to economic growth. (Aghion and Williamson, 1998; World Bank,2002; James, 2002)have analysed the relationship between globalisation and various factors like growth, poverty, technology, inequality, etc

(Dollar, Kraay, 2002; Stglitz, 2004)analysed developing countries witnessing rapid growth because of globalisation and also suggested that it can have adverse effects if not managed properly. Stglitz also mentioned eight channels through which adverse effects take place.

(Dreher ,2006,2008) introduced KOF index of globalisation to analyse the impact of globalisation on the economic growth of 123 countries, dividing globalisation index into Social,Political and Economic globalisation indices. Robustness of the index has been checked by many researchers.

(Afzal,2007; Shaikh and Shah,2008)examined in their study the positive impact of globalisation on macroeconomic performance. (Changand Lee, 2010) examined the impact on economic growth of OECD countries, (Rao et al.,2011) for 21 low income African countries and (Leitão, 2012) for American economy. (Aka,2006) assessed the relationship between openness and globalisation on economic growth in Côte d'Ivorie, using VAR model.

(Mustascu and Fleischer, 2011) investigated globalisation in Romania and its impact on economic growth of Romania, suggesting a unidirectional causality running from economic growth to globalisation. (Morita et al., 2015; Iovitu et al, 2015) suggested globalisation as the engine for economic growth. (Ray,2012) found similar results for India.

The studies on the impact of globalisation on economic growth are numerous but the dynamic nature of globalisation requires a time to time revaluation of the process and its effects that follows. The aim of the present study is to fill the gap in limited literature in Indian context, indicating the trends for the new phenomenon and policy frameworks.

Data

Annual rate of growth of GDP (GDPrt) of India has been taken for 46 years (1971-2016) from the UNCTAD data centre. The three globalisation indices have been obtained from the KOF data base of the Swiss Economic Institute. The components of the globalisation indices are Economic Globalisation Index(EGI) (35%), Political Globalisation Index (PGI) (28%) and Social Globalisation Index (SGI) (38%).

The data on economic integration consists of Actual flows (50%) and trade Restrictions (50%). Actual flows are measured with the help of Trade, 23%; Foreign Direct Investment, 29%; Portfolio investment, 27% and Income payments to foreign nationals, 22% (all in percentage of GDP). Restrictions consists of the Hidden import barriers,20%; Mean tariff rate, 30%; Taxes on International trade (in percentage of current revenue,24% and Capital account restrictions, 26%.

The data on Political engagement is assessed using the number of embassies in a country, 28%; Membership in international Organisations-34% and participation in the UN security Council missions,32%.

The data on social globalisation is calculated on the basis of Data on personal contact (24%), Data on information flows (39%) and the Data on cultural proximity (37%). Data on personal contact is assessed using the outgoing telephone traffic-31%; Transfers (in percentage of GDP) ,9%; InternationalTourism, 1%; Telephone average costs of call to USA ,33% and Foreign population (in percentage of total population), 26%.

Data on information flow is based on the telephone mainlines (per 1000 people), 18%; Internet hosts (per capita), 15%; Internet users (as a share of populations),18%; Cable television (per 1000 people),16%; Daily newspapers (per 1000 people),16% and Radios (per 1000 people),17%. Data on cultural proximity is based totally on the number of Mc Donald's restaurant (per capita).

All indices range between 0 (not globalised) and 10 (globalised).

Methodology

Annual rate of growth of GDP is assumed to be a function of Globalisation index, ceteris paribus.

$$GDP_{rate} = f(GI) \qquad (i)$$

Where, GI is the overall globalisation index.

To test the effect of all the components, the following equation is used:

$$GDP_{rate} = C + \beta_1 EGI + \beta_2 PGI + \beta_3 SGI + \varepsilon$$

where: C is a constant (intercept), $GDP_{rate}$is the annual rate of growth of the GDP. EGI is the Economic Globalisation Index, PGI is the Political GlobalisationIndex, SGI is the Social Globalisation Index and β_1, β_2 and $\beta_3$are their respective regression coefficients to be estimatedandε is the error term.

To check the stationarity of the model, Unit root Test is conducted with ADF test. The model is estimated using OLS. Complying to the basic assumptions of OLS the model is checked for the Auto-correlation and homoscedasticity. Further, Granger causality test is undertaken.

Data has been processed using Eviews 9.0 software.

Results and Findings

The unit root test are results are as follows:

Table 1: Unit Root for with Augmented Dickey Fuller (ADF) test

Variable	With Intercept	With Intercept & Trend	Without Intercept & Trend	Level of stationarity
GDPrate	-5.75402***	-7.32806***	-0.8574*	Level
EGI	-2.60394*	-2.48363*	-2.28185***	1st Difference
PGI	-8.54912***	-8.50592***	-7.61335***	1st Difference
SGI	-4.90807***	-4.85202***	-4.59251***	1stDifference

Note: ***, **, *suggests stationary at 1%, 5% and 10% level of significance respectively.

GDPrate is found to be stationary at 1% level of significance with intercept at level. EGI is stationary at 10% level of significance with intercept. PGI and SGI are stationary at 1% level of significance with intercept at 1st difference.

Table 2: Results of OLS (1971-2016)

Constant	-7.375 (5.364)
EGI	0.019 * (0.112)
PGI	0.179* (0.094)
SGI	-0.077 (0.117)
R-squared	0.530
Adjusted R-squared	0.514
No. of obs	46

Standard errors are reported in parentheses. *, **, *** indicates significance at 90%, 95 % and 99% level, respectively.

The model is statistically validated for a significance threshold of 5%, Prob (F-statistic) is 0.004263 < 0.005 and F-statistic (5.092586) > $F_{0,05;3,42}$= 2.82704872.

EGI has a positive impact on GDP rate, the coefficient being 0.019063 and Prob of 0.0865 (<0.10) and a standard error of 0.112076. PGI too has a positive impact on GDP rate, its coefficient is 0.179702 for a Prob of 0.0630 (<0.10) and a standard error of 0.094083. SGI has

a negative validated influence on GDP rate, its coefficient is -0.076695 for a Prob of 0.0517 (<0.10) and a standard error of 0.117418.

The estimated equation is:

GDP_{rate} = -7.37555136267 + 0.0190632208029*EGI + 0.179702446524*PGI - 0.076694601847*SGI

Heteroskedasticity of errors is tested using the White test (Table 3).

Table 3: Heteroskedasticity Test: White

F-statistic	0.970090	Prob. F (9,36)	0.4802
Obs*R-squared	**8.978536**	Prob. Chi-Square (9)	0.4393
Scaled explained SS	15.28632	Prob. Chi-Square (9)	0.0834

The value of obs*R-squared (8.978536) $<x^2_{0,05;9}$=16.91897760, suggesting the model is homoscedastic for a significance level of 5%.

Further the model is checked for autocorrelation (Table 4)

Table 4: Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.207373	Prob. F (2,40)	0.8136
Obs*R-squared	**0.472063**	Prob. Chi-Square (2)	0.7898

The value of the obs* R-squared (0.472063) $<x^2_{0,05;2}$ =5.99146455, meaning the null hypothesis is accepted and errors are independent.

Table 5: Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
EGI does not Granger Cause GDPRT	44	3.50706	**0.0398**
GDPRT does not Granger Cause EGI		0.65882	0.5231
PGI does not Granger Cause GDPRT	44	3.51587	**0.0395**
GDPRT does not Granger Cause PGI		0.11284	0.8936
SGI does not Granger Cause GDPRT	44	2.77531	0.0747
GDPRT does not Granger Cause SGI		0.54006	0.5870
PGI does not Granger Cause EGI	44	4.11773	**0.0239**
EGI does not Granger Cause PGI		0.53893	0.5877
SGI does not Granger Cause EGI	44	4.40286	**0.0189**
EGI does not Granger Cause SGI		1.92460	0.1595
SGI does not Granger Cause PGI	44	0.07560	0.9273
PGI does not Granger Cause SGI		6.54637	**0.0035**

Based on the Probability values reported in the table 5, it can be suggested that Granger causality runs one way from EGI to GDPRT, from PGI to GDPRT, PGI to EGI, SGI TO EGI and from PGI to SGI. However, no bidirectional causality has been established. It is evident with the results that any changes in PGI precede changes in GDPRT, EGI and SGI. Further, SGI predictably changes before EGI and EGI before GDPRT

Implications

The positive influence of economic globalisation on economic growth can be attributed to the increased trade and commerce with the rest of the world. As an economy is globalising on economic dimension, it is directly accounting for an increase in GDP as the trade, inflow and outflow of investments etc flourish.

The impact of political dimension on economic growth is related to India's involvement in the membership in various treaties and organisations, number of embassies. For instance, India hosts 151 embassies/high commissions, and in addition there are 254consulates and 18 other representations in India, signifying a high political globalised nation and hence providing better avenues for trade and commerce to expand and hence an increased GDP.

One of the possible reason of negative influence of social globalisation index on economic growth could be the phase of protectionism being followed by the developed nations. For instance, restricting the to and fro flow of information, people and ideas from one nation to another which is directly hampering the output of an economy.

Conclusion

The study intended to analyse the impact of all the aspects of globalisation on the economic growth of India. Economic globalisation suggested by the flow of goods, capital and services and information about the market exchanges. Political globalisation characterisedby the diffusion of the government policies and memberships of countries in international agreements. And, social globalisation characterised by the spread of ideas, people, information and cultural similarities.

The economic dimension of globalisation is evidently affecting the economic growth positively and significantly. It is because of the financial developments and significant contribution of trade. The political dimension too affects the economic growth as the nature of the political system of an economy goes hand in hand with the framing of the economic policies and planning of an economy. However, social aspect of globalisation is found to have a negative influenceon growth as it depends on aspects like international linkages, flow of information and the cultural proximity.

With this comes the role of the policy makers to increase the benefits from globalisation by drafting strategies and policies where the development of human capital can lead to increase in the economic growth of the economy. This would also increase in the trade of innovation.

India indeed has benefitted from globalisation, which is also supported by the empirical evidence form the study. India is an emerging nation, providing a pool of human resources,innovations, goods and services to the rest of the world. More appropriate policies can be used to harness the advantages of India's position in the global society.

Many researchers have contributed to the investigation of impact of globalisation on economic growth. However, still leaving the question of fate of globalisation in the post global financial crisis era with a major setback to world trade in 2008. The question still remains unanswered that whether nations are still moving towards globalisation or reversed their paths towards de-globalisation. Giving a next phase to the research project.

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Financial Performance of Disinvested Public Sector Enterprises in India

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Abstract

The objective of the paper is to assess the impact of disinvestment on the financial performance of disinvested central public sector enterprises (PSEs) during the time span of more than two decades. The paper also aims at analyzing the role of degree of disinvestment on the performance/improvement of the sample disinvested PSEs. The findings suggest that disinvestment brings no major improvement in the parameters of profitability, assets turnover and capacity utilization even after eight years of disinvestment; improvement has been noted in respect of productivity of capital and liquidity only. The improved performance in respect of liquidity, leverage, inventory holding period (IHP) and productivity has been noted due to higher degree of disinvestment in disinvested PSEs.

Keywords: Disinvestment, financial performance, efficiency, privatization.

Introduction

The emergence of financial reforms was realized in 1990's when Indian economy was continuously facing high burden of financial debt (nationally and internationally) since 1980's. The increased revenue expenditure of the government on the items such as interest payments, wages and salaries of the government employees and subsidies, left the government with hardly any surplus for capital expenditure on social and physical infrastructure. However, the government was interested in spending on basic education, primary health and family welfare as well as on infrastructure, but large amount of resources were blocked in several non-strategic sectors such as hotels, trading companies, consultancy companies, textile companies, chemical and pharmaceuticals companies, consumer goods companies etc. (Gupta at. el. 2011).

Due to unbounded and cumulative financial burden, the Indian economy was almost on the verge of financial disaster. Therefore, disinvestment was conceived as an important measure to salvage such a grim situation; it was expected that the disinvestment process would also act as a catalyst to improve the financial performance/ business performance and management practices of these PSEs. Evidently, it was conceived to have larger implications rather than just selling the government equity at the best price. It was expected to contribute towards the growth of Indian economy by promoting competition; it, in turn, promotes the market friendly economy than the command economy which leads to cost reduction, improved quality and operational efficiency. Likewise, disinvestment was also expected to attract global capital as well as domestic capital. Above all, disinvestment of government equity in PSEs has many social, economic and political implications (Ray and Maharana, 2002).

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The objective of the paper is to assess the financial performance of the disinvested central public sector enterprises (PSEs). For better exposition, the paper has been divided into six sections including the present one. Section two enumerates brief review of literature. Section three describes the research methodology to be followed and sources of the data. The impact of disinvestment has been examined under section four. Section five measures the impact of degree of disinvestment on the financial performance of disinvested PSEs. Lastly, the concluding observations, recommendations and implication of the study have been enumerated in section six.

Literature Review

The select literature relating to various important aspects of privatization and disinvestment, narrating global experiences (with focus on Indian perspective) has been presented in this section.

First one is concerned with the purpose/objective pertaining to disinvestment policies (at cross-country and Indian levels); Kay and Thompson (1986) had examined the rationale of privatization in U.K. and the sale of government industrial assets. They observed that the denationalization of public industry served multiplicity of objectives such as improving the economic performance of the industries concerned, resolving the persistent problems of management and control (i.e., the relations between government and nationalized industries), ensuring better discipline among the power of public sector trades unions and promoting popular capitalism through wider share ownership. Basu (1994) has conducted a study on the privatization of developing country's agenda which includes restructuring, reform, commercialization, management-cum-technology contracts and leasing; the primary objective of government's privatization policy has been to revive potentially viable loss-incurring enterprises and to safeguard the interest of the workers and to create opportunities for further job creation by catalyzing the dynamism of the private enterprises. Efforts are made to establish a system of good corporate governance practices in these core enterprises with intend to enhance transparency and accountability in their operations and stimulate their performance.

Kaur and Singh (2005) and Singh (2004) state that disinvestment in India leads to cost reduction, improves quality and operational efficiency in order to push up the growth rate of the economy which, in turn, provides jobs and employment opportunities; disinvestments also help to attract global and domestic capital. The authors state that PSEs provide facilities for certain sections of society by selling the products at lower prices than the cost incurred. This was triggered by organizational efforts towards non-economic activities which led to economic inefficiency and failure. Naib (2004) states that disinvestment of equity has been the key determinant of the Indian public sector reforms. The common perception amongst various countries that have engaged in substantial programme of divestiture is not only to raise resources for the governments and to reduce fiscal deficit but also to release resources for public investment in essential areas like primary education and basic health. It is accordingly argued that such programs ultimately are desirable to create jobs and add for mass welfare in the long-run. Roli and Zhan (2011) suggest that management culture may not necessarily have the same effect or hold similar values in the subsidiaries of Indian multinational companies located in developed countries because of the many cultural and institutional differences.

Second aspect deals with the studies specifying conditions, factors and features of disinvestment policies. Gupta et. al. (2000) and Kay and Thompson (1986) state that fiscal constraints seem to be the main motivating factor in choosing partial privatization and this is consistent with the empirical findings. It is also possible, however, to interpret revenue maximization as a political objective. The treasury is primarily interested in the revenue which can be obtained from privatization. The ability to generate revenue enables a government to soften the employment

impact of the transition process; it raises the government's ability to pay state-workers and so on. These factors are arguably very important in gaining support for the transition process. Disinvestment Manual (2007) contains no standard recipe for disinvestment in PSEs at the national level or at the state level. It suggests that country would do well to learn from the successful experiences of the West; it would have to be careful with the pitfalls which were responsible for setback to some of the economies in the East; while experience of other countries is available to India by way of guidance; it would have to evolve its own techniques, best suited to its level of development. The historic, cultural and institutional context influences the way in which and the pace at which privatization is implemented. Where market economy is not fully developed, ways would have to be found to safeguard the interests of consumers and investors, which would ensure a fuller play to the wealth creating role of the entrepreneurs.

Hamid and Chao (2006) use a simple model to identify the conditions for assessing the privatization effect on environment. They have shown that privatization can have a negative effect on the environment. Rossitza (2009) states the strategic interdependence between market reforms and foreign direct investment (FDI) in transition economies in the 1990s. He contends that FDI contributes to economic restructuring through acquisitions in host countries with rapid market reforms and slow reform motivates firms to minimize exposure to operational uncertainties through new plant investments; FDI plays a mediating role in economic reform. Arnold et. al. (2008) suggest that conventional explanations for the post-1991 growth of India's manufacturing sector have focused on goods, trade liberalization and industrial de-licensing. However, the pace of policy reform has varied across sectors and it is determined primarily by political considerations (Hoekman et. al., 2007).

Third enumerates the techniques or methods used by several research proponents to assess the performance of the enterprises; Jain (1989) and Keswani and Shackleton (2006) use incremental analysis for performance assessment; Jain (1989) suggests that industrial projects located in backward areas (as a part of its deliberate policy to achieve the objective of balanced regional development) was the probable reason of low profitability and depressed rates of return of Industrial Finance Corporation of India (a public sector development bank); it has faced the challenge between developmental functions and economic functions in achieving profitability. Keswani and Shackleton (2006) emphasize that the option to disinvest is as important as the option to invest in enhancing project value.

Bradbury (1999), Abelson (2003) and Sueyosh (1998) have adopted case studies approach to assess the performance of disinvested PSEs; Bradbury (1999) uses prime performance measures, namely, return on equity (ROE) and return on assets (ROA) to compare the financial performance of Government Computing Services (GCS) as it moves from a government department to privatization. The results show that the financial performance of GCS improves. The Growth in revenue is also measured. Similar measures are employed in major studies that utilize accounting ratios to examine economic performance (Rumelt, 1974; Boardman and Vining, 1989; Karpoff and Rice, 1989). Abelson (2003) reports nine cases that cover a variety of Australian jurisdictions, industry and disinvestment methods. Out of the nine case studies, the author derives three main lessons. First, long-term financial returns have played very little part in the decision to privatize. Second, considerable transformation had taken place in many of the organizations in the preparation for the sale, including assistance for the government; he observed that this transformation and assistance were largely responsible for the success of the organizations post-sale. Third, there is a consistent pattern of winners and losers from the privatization. The winners were the financial institutions, the new shareholders and private consultants; the main losers were the workers in the pre-sale organizations and future taxpayers.

Sueyoshi (1998) examines the economic assertion by comparing Nippon Telegraph and Telephone (NTT), a Japanese government company's performance before and after its privatization and presents the management problems occurring within the partial privatization. He noted that NTT's partial privatization had an impact on its productivity enhancement, primarily due to a natural reduction in personnel. It had failed to achieve any significant improvement in cost management even after its privatization.

Further, Yip et.al. (2009) have used frontier analysis technique to identify the relative performance and examine the issues of determining long-term (sustained) superior financial performance. The approach provides managers and analysts a powerful logical heuristic that can help them in making quicker and better decisions; given the failure of past performance to signal how firms would be able to weather a pervasive global crisis. Miguel (2008) has used panel data econometric model to assess the quality of service of electric distribution utilities in Latin America and its effect on the sustainability of privatization. He opines that the quality of service could be a hidden cost of privatization because the policies of regulation have neglected the quality-of-service issue. Kumar (1992) categorizes state owned enterprises (SOEs) on the basis of their being high or low with reference to market structure, efficiency and social obligations. He suggests divestiture of enterprises which are low in efficiency and have social obligations. Further, he desires that SOE set up as a statutory corporation under an Act of Parliament or as government department needs to be transformed into a stock corporation subject to ordinary company laws so that shares can be offered to the private sector.

The fourth dimension is explicitly confined to the studies related to the pre and post disinvestment based analysis of PSEs; Hammer et.al (1989) examine the management dimension before the state owned enterprises (SOE) are being privatized. They suggest that privatization strategy is closely linked with the overall business strategy. The privatization strategy must provide a clear step by step process for achieving the state's goals, new direction for the company, implementing vision and identifying and attracting a suitable group of investors. The privatization strategy has to be closely linked with the overall business strategy in order to exploit the long-term profit enhancement opportunities.

Megginson et.al., (1994) compare the pre and post-privatization financial and operating performance of the period three-years-after with that of the three-years-before privatization of 61 companies from 18 countries (6 developing and 12 industrialized) and 32 different industries that experience full or partial privatization during the 1961 to 1989. Under these companies, government sold off its equity but no capital flowed to the firm itself. Therefore, any improvement in performance after divestment must be traced to changes in incentives, regulation and ownership structure rather than to cash injections into the firm from a new capital issue. They document significant increase in profitability, output per employee, capital spending and total employment after privatization. Martin and Parker (1995) examined whether 11 British firms privatized from 1981 to 1988 had improved their profitability (measured as return on invested capital) and efficiency (annual growth in value added per employee-hour) after being divested. They found mixed results. Gupta **(**2005) observes that partial privatization has a positive impact on profitability, productivity and investment. The study is based on 339 manufacturing and service sector firms owned by the central (247) and state governments (92) of India for the year 1990–2002. Firms experience a significant increase in profitability, labor productivity, R&D investment and intensity, asset size and employment after partial privatization (without layoffs).

Comparative analysis based on disinvested and non-disinvested PSEs at cross-country level has been dealt under fifth dimension; Bishop and Kay (1989) compare performance of privatized UK companies with those that stayed in the public sector. They find no strong evidence to

indicate that privatized firms perform better. They have measured profitability, in terms of return on capital employed (ROCE) and return on sales (ROS) and found both ROCE and ROS were generally higher among the privatized companies than among the public sector ones, but this had been true even before the companies had been privatized. Thus, it appears that the more profitable firms were sold early, leaving the less profitable ones in the public sector. Lorch (1991) compares the performance of 24 privatized textile mills in Bangladesh with 35 other mills that the government did not privatize by using unconventional measures of performance. He focuses on four functional areas: procurement, production, sales and support function. 'Efficiency' was defined as 'cost-advantage'. He concludes that the Bangladesh textile industry does not offer a very strong endorsement of privatization as far as its efficiency implications are concerned.

Boubakri and Cosset (1998) examine the change in the financial and operating performance of 79 companies from 21 developing countries that experience full or partial privatization during the period from 1980 to 1992 (by using adjusted as well as unadjusted accounting performance measures). Both unadjusted and market-adjusted results show significant increases in profitability, operating efficiency, capital investment spending, output, employment level and dividends. They also find decline in leverage following privatization but this change is significant only for unadjusted leverage ratios. It is generally less significant when they adjust the performance ratios for market effects; further, they examine how privatization in the developing countries affects the financial and operating performance of their public enterprises. Ramamurti (1997) examines the restructuring and privatization of Ferrocarilla Argentinos, the Argentine national freight and passenger railway system. He observes the incredible 370 per cent improvement in labour productivity and an equally striking 78.7 per cent decline in employment (from 92,000 to 18,682 workers). He stressed that performance improvement could not have been achieved without privatization.

The sixth dimension deals with causes/reasons of failure of disinvestment; Kaur and Singh (2005) state that the PSEs operated under the heavy weight of non-commercial obligations of the state and untrammeled discretionary power with the government that erodes their autonomy. They caution that disinvestment does not mean that there is a move to withdraw investment; rather, it is the canalization of the investment in a more productive and efficient way so that it can prove itself as an acceleration of growth. Naib (2004) has revealed that the vast investments have failed to produce the surpluses and the return on capital employed is quite low. This raises the issue whether the present ills of the SOEs can be corrected by change in their ownership. Gouri (1997) observes that privatization in India is low and is limited to disinvestment of PSEs for raising non-inflationary resources. At the same time, there is a gradual withdrawal of budgetary support from PSEs resulting in a gradual dilution of equity as enterprises tap the capital market. Simultaneously, economic liberalization policies have emphasized a level-playing field for the public sector. In terms of economic management, and more so, public sector management, there is lack of a comprehensive policy on privatization that can result in unexpected outcomes which may not be all that expedient. Vadlamannati (2007) finds very feeble and weak relation in view of the very small sized and slow paced disinvestment and privatization program. Further, Arnold et.al. (2008) have identified the sectors in which privatization and competition would mean restructuring and large scale lay-offs; slower to benefit from the reforms than those in which incumbents could remain profitable and employment would not decline even where foreign and local private competitors entered the market.

Notwithstanding the above notable works/studies on the subject, there has been no single study which examines in-depth the impact of disinvestment on all major parameters of financial performance (profitability, liquidity, solvency, efficiency, productivity etc.) of PSEs in India for

the time span of more than two decades. The present paper is a modest attempt to fill this gap.

Research Methodology

The sample to the study consists of 38 non-financial disinvested central PSEs in India where less than 50 per cent of the disinvestment has been undertaken up to the year 2001-02. The sample is representative in nature, represents all the industrial groups that have gone for the disinvestment as per Public Enterprises Survey. The performance of the enterprises has been compared five years before and after eight years after the disinvestment for the time span of 23 years (1986-87 to 2009-10) on rolling basis; the purpose is to ascertain whether there has been any significant change in the financial performance during the long tenure of eight years in the post-disinvestment period due to disinvestment or not. The period of the study is restricted to the year 2010 due to the change in reporting standard of financial statements from the year 2011-12 as per Revised Schedule VI of Company Act 1956[4]; this, in turn, has brought change in many figures/constituents of balance sheet and income statement Therefore, we were constrained to have the present study restricted to 23 years (where financial reporting requirements remain virtually same over a period of time of the study).

There are three major reasons for choosing cut-off year 2001-02. First, during initial years small amount of disinvestment has taken place and afterwards due to several reforms and policies, the amount of disinvestment has witnessed a decisive increase in the succeeding years in certain PSEs; in operational terms, the cumulative amount of disinvestment (till the cut off year) has turned out to be reliable. The second relates to the change of disinvestment policy and commencement of strategic disinvestment; major proportion of strategic disinvestment had started from the year 2001-02 onwards, wherein, more than 50 per cent of disinvestment had been undertaken. The third equally important reason is that the last year used for the purpose of the analysis in the study is 2009-10; to assess the performance of disinvestment, the pre-five-years and post-eight years time-lag requirement gets fulfilled at 2001-02; the purpose of selecting post-disinvestment 8 years time period is to elaborately examine the impact of disinvestment on the financial performance of these PSEs in long run. For statistical tests, the first phase (five years prior to disinvestment) and the second phase (eight years subsequent to disinvestment) are considered as two independent samples.

Relevant secondary data has been collected from the various volumes of Public Enterprises Survey. Financial performance has been measured on the aggregate and dis-aggregate basis. In each analysis, we have relied primarily on 19 financial ratios pertaining to profitability, operating efficiency, leverage, liquidity and productivity. It is worth stating that the primary objective of disinvestment has been to enhance operational efficiency leading to better/higher profitability. Therefore, profitability and efficiency ratios are relatively of higher significance than liquidity and solvency ratios. This would constitute the focus while interpreting the results of post-disinvestment *vis-à-vis* pre-disinvestment period.

Profitability has been assessed on the basis of rate of return on investment and sales. The return on investment has been computed in three ways, *viz.*, return on total assets (ROTA), return on capital employed (ROCE) and return on net worth (RONW). The first two rates of

4. Ministry of Corporate Affairs (Government of India) Notification no. F.No.2/6/2008-C.L-V dated 30-3-2011, revised the existing Schedule VI to the Companies Act, 1956 and made it applicable to all companies for preparation of the Financial Statements from the financial year commencing on or after April 1, 2011. Financial statements are to be prepared for the year 2011-12 (1st April 2011 to 31st March 2012) onwards as per revised/changed schedule.

return highlight how efficiently financial resources are deployed by the PSEs and RONW indicates the return provided to the equity-owners (primarily government in the context of PSEs).

It is important to note that the ROCE and RONW have not been computed in the case of PSEs having negative net worth and negative capital employed. The reason is that the ratio provides ridiculous results when the denominator is negative. However, the numerator can be negative as it indicates that the PSE has suffered a loss (at the computed negative rate) on capital employed/net worth. Therefore, positive net-worth and positive capital employed with negative net-profit and negative EBIT have been included in the study; they signify that net-worth or capital employed is positive with the company but has earned negative profits or losses.

Secondly, return on the basis of sales has been computed on the basis of operating profit margin (OPM) and net profit margin (NPM). The OPM represents the operating profit before any compensation paid to the debt-holders. The ratio provides a clear view of profit margin (undistorted by financing pattern and tax calculation) referred to as earnings before interest and tax (EBIT) relating to sales. The NPM determines the relationship of reported net-profit after taxes to sales; it indicates the management's ability to carry on the business profitably and expresses the overall cost/price effectiveness (Helfert, 2003). Thus, the methodology outlined above is appropriate for evaluating profitability.

Similarly, efficiency or effectiveness in utilization of resources has been determined on the basis of three dimensions. The first one is concerned with the efficiency with which assets are used in business enterprises by its management. Turnover is the primary mode for measuring the extent of efficient use of assets by relating them to net sales; they are total assets turnover ratio (TATR), fixed assets turnover ratio (FATR) and current assets turnover ratio (CATR). Low turnover is indicative of under-utilization of available resources and presence of idle capacity. TATR indicates the efficiency with which firm uses its assets to generate sales. Generally, higher the firm's TATR, the more efficiently the assets are being used (Gitman, 2009). TATR, FATR and CATR are computed dividing average net sales by average total assets in use, average fixed assets (excluding depreciation) and average current assets respectively.

The second dimension of efficiency is based on examining the change in holding period (in number of days) of various types of inventories and collection period of debtors which are the sub-constituents of current assets. The objective of inventory management is to minimize the investment in the inventory and to meet the demand of products by efficient production and sales operation with a view to reduce carrying cost and stock-out cost. Inventory consists of raw materials, spare parts and other stores as raw-material inventory holding period (RMIHP), work-in-progress inventory holding period (WIPIHP) and finished-goods inventory holding period (FGIHP). RMIHP is the ratio of raw materials consumed during the year and average raw materials at the beginning and end of the year; WIPIHP has been computed on the basis of cost of production (represents all costs incurred on production/operation including depreciation but excludes excise duty) and average work-in-progress in the beginning and end of the year; it is to preclude the impact of changes in the excise rates from the analysis. Similarly, FGIHP is based on the relationship between cost of goods sold (numerator), i.e., cost of production plus opening stock of finished goods minus closing stock of finished goods, and average finished goods (denominator). Debtor collection period (DCP) presents the relationship between gross sales (numerator) and average debtors in the beginning as well as in the end of the year (denominator).

The third variant of efficiency measurement explores the change in the capacity utilization of fixed assets over a period of time. To draw more candid picture pertaining to utilization of fixed assets as well as to measure the change in capacity utilization (CU) of fixed assets over a

period of time, the fixed assets have been grouped into four categories on the basis of their usage, i.e., CU of fixed assets below 50 per cent, between 50 to 75 per cent, between 75 to 100 per cent and above 100 per cent.

Capital structure practices assume vital significance in corporate financial management as they influence both return and risk of equity owners of corporate enterprises. This part provides an insight into their capital structure practices and liquidity position. Total debt to total equity (TD/TE) has been used to determine the capital structure practices; it is the relationship between borrowed funds and shareholders' funds/net-worth; shareholders funds are equal to equity capital + preference-capital + reserves and surpluses -accumulated deficit - deferred expenditures not written-off. Total debt is inclusive of long and short-term debt; short-term advances are ostensibly short-term but are generally renewed year after year and hence serve the long-term needs of the firm.

Further, the position of liquidity has been measured in terms of current ratio (CR) and acid test ratio (ATR). The PSEs should maintain adequate liquidity in terms of satisfactory CR and ATR which depends on their access to sources of funds and ease with which these funds can be tapped in times of need. In general, sizeable numbers of PSEs in India have arrangements for short-term credit needs, say, in the form of bank borrowings/overdraft and cash-credit limit from banks which enables them to operate on the lower margin of working capital. This is reflected in relatively lower current ratio (CR) as well as acid test ratio (ATR). It is important to mention that conventionally a CR of 2:1 and an ATR of 1:1 are considered satisfactory.

For the successful operation and productivity of PSEs, Government has initiated voluntary retirement scheme (VRS) in PSEs during 1988 and 2002 (a new scheme for VRS) to shed the excess manpower and to improve the age-mix and skill-mix. Simultaneously, in order to improve the quality of the manpower, several training programs are organized which update their knowledge and skills. Thus, another equally important aspect assessed relates to the productivity of capital per employee which has been determined in terms of level of employment, sales efficiency (SE) and net income efficiency (NIE) ratios.

Further, the computation of select financial ratios in each sample PSE has been determined on the basis of last year of disinvestment by considering last year in that organization as zero year; then, the ratios of all the individual enterprises have been aggregated to process further to determine various positional values (on rolling basis).

To study the trend and its implications, the descriptive statistics and positional values, i.e., mean, median and quartiles have been computed for each PSE. In addition, to overcome the variations of the sample data mean of mean, median of median and quartile of quartile have also been computed of each enterprise in each phase. To do away with the influence of extreme values, they have been excluded from the data; the details of excluded values have been mentioned at the footnote of the tables.

To determine the change over a period of time and across the phases on the same set of companies paired t-test has been carried out; analysis of variance (ANOVA) has also been applied on more than two sets of companies to determine the change within a group (or same set of companies) and with the other group of companies. The significance levels of 1 per cent and 5 per cent have been considered for reporting the results. The entire set of data has been analyzed by using Statistical Package for Social Sciences (SPSS).

Survey findings are predominantly based on 15 responses received form disinvested PSEs. All the analysis of the questionnaire survey is presented for the sample responding companies. This point should be borne in mind while interpreting the results.

Disinvested Central Pses

This section aims at assessing and comparing the financial performance of disinvested PSEs (before and after) on rolling basis. In brief, the section tests the following hypothesis:

H1: Disinvestment has improved the financial performance of PSEs.

Contrary to the expectations, the sample disinvested enterprises has shown dismal performance; a marginal decline in the mean values of all the five profitability ratios (i.e., RONW, ROCE, ROTA, NPM and OPM) has been observed during the post-disinvestment period *vis-α-vis* pre-disinvestment period (Table 1 and Figure 1); this decrease is insignificant statistically. Likewise, decline in TATR, FATR and CATR has also been noted in the same period (Figure 2). However, disinvested PSEs are able to decrease the man-power employed (pronounced in VRS) which is statistically significant as per paired t test. Virtually due to that, a notable increase has been noted in the productivity ratios (sales efficiency and Net income efficiency, NIE) during the second phase compared to the first phase which is significant statistically. Increase in leverage (TD/TA) and liquidity ratios are also worth noting, getting the benefit of cheaper source of finance and better liquidity position.

Table-1: Mean Values of Key Financial Ratios of PSEs Opted for Disinvestment, 1986-87 to 2009-10

Variables	No of firms Before (After) #	Mean 5 yrs before and 8 yrs after of disinvestments		Significance level	Median 5 yrs before and 8 yrs after of disinvestments		Q1: 5 yrs before and 8 yrs after of disinvestments		Q3: 5 yrs before and 8 yrs after of disinvestments	
		Before	After		Before	After	Before	After	Before	After
Profitability Ratios (in percentage)										
RONW	38(38)	13.58	10.89	0.08	11.74	10.05	5.27	2.39	20.34	21.91
ROCE	38(37)	14.04	11.26	0.12	12.65	9.80	6.33	-0.96	19.25	23.78
ROTA	38(37)	11.83	10.19	0.16	10.86	8.71	7.17	3.26	16.03	17.53
OPM	38(38)	15.49	12.37	0.09	12.62	9.36	6.14	2.76	21.32	22.20
NPM	38(37)	8.27	6.97	0.26	4.79	5.05	2.17	0.35	15.82	15.15
Efficiency Ratios (in times)										
TATR	37(37)	1.08	0.99	0.18	0.81	0.70	0.48	0.52	1.48	1.01
FATR	35(35)	3.33	3.31	0.95	2.46	2.19	1.19	1.01	5.20	6.25
CATR	37(37)	1.94	1.72	0.08	1.46	1.36	0.79	0.83	2.68	2.34
• DCP@	37(38)	62.13	70.37	0.18	43.56	45.13	14.68	13.99	95.05	128.67
• RMIHP@	30(31)	147.56	130.49	0.08	102.53	110.28	66.12	40.97	246.03	190.03
• WIPIHP@	27(27)	23.71	21.14	0.23	9.54	5.68	1.13	1.35	49.26	50.01
• FGIHP@	31(31)	28.51	24.13	0.03*	18.83	20.30	20.30	11.59	11.29	15.40
Leverage (in times)										
TD/TE	38(37)	0.99	1.02	0.68	0.74	0.57	0.28	0.14	1.70	2.04
Liquidity (in times)										
CR	38(37)	1.67	1.84	0.19	1.45	1.72	0.95	1.09	2.36	2.57
ATR	38(38)	0.90	0.99	0.32	0.86	0.86	0.35	0.40	1.48	1.60
Productivity/Output										
Sales Eff.!	38(38)	36.97	86.77	0.05*	7.59	16.81	3.79	7.60	43.57	159.28
NIE !	38(38)	2.26	5.36	0.00**	0.82	1.31	0.18	-0.01	1.89	5.56
Employment	38(38)	18191	15870	0.01**	7754	6773	2558	2332	19063	19757

Notes: 1. PSEs having negative net-worth have been excluded and RONW has been based on net profit.

2. OPM and NPM stand for operating profit margin and net-profit margin on sales respectively.

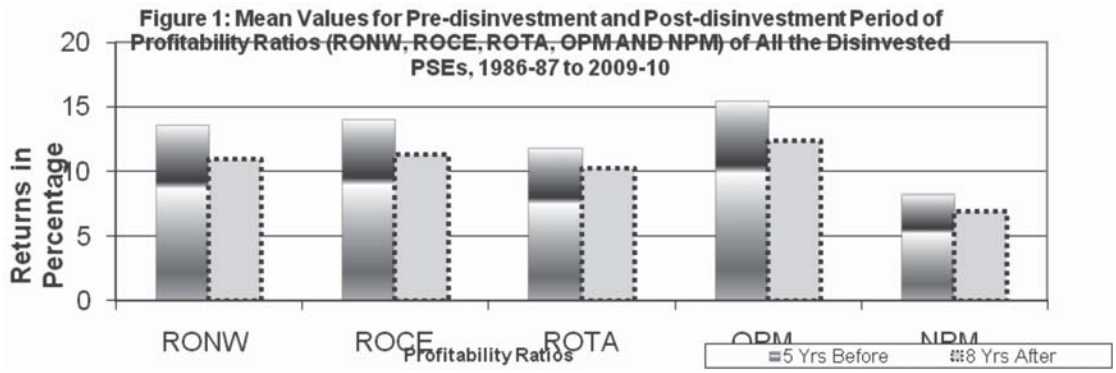
3. ROTA is based on earnings before interest and taxes (EBIT).

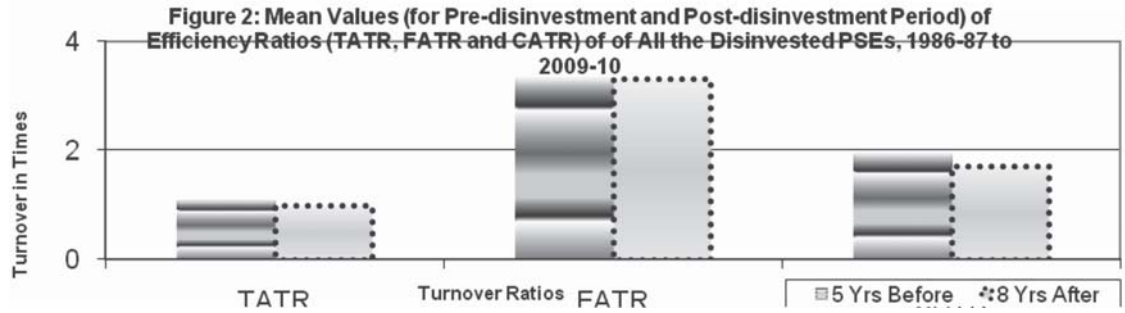
4. ROCE is based on operating profit which excludes non-operating incomes (or other incomes) from EBIT.

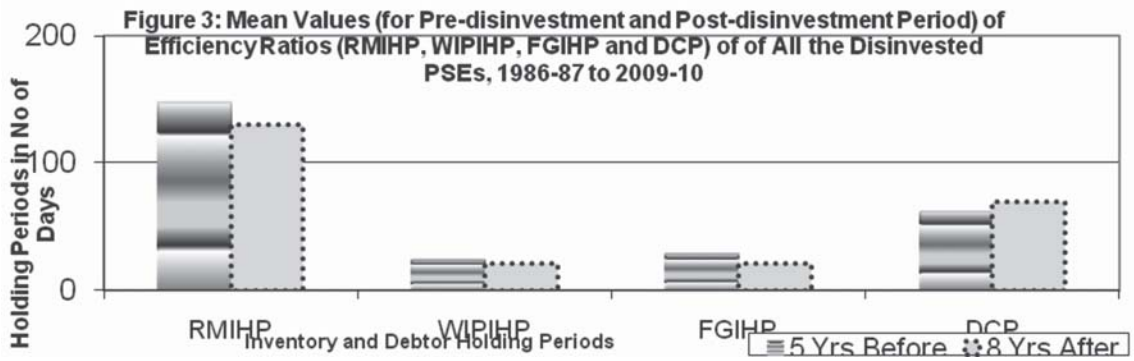
5. ** and * mark to the significant level at 1% and 5% respectively.

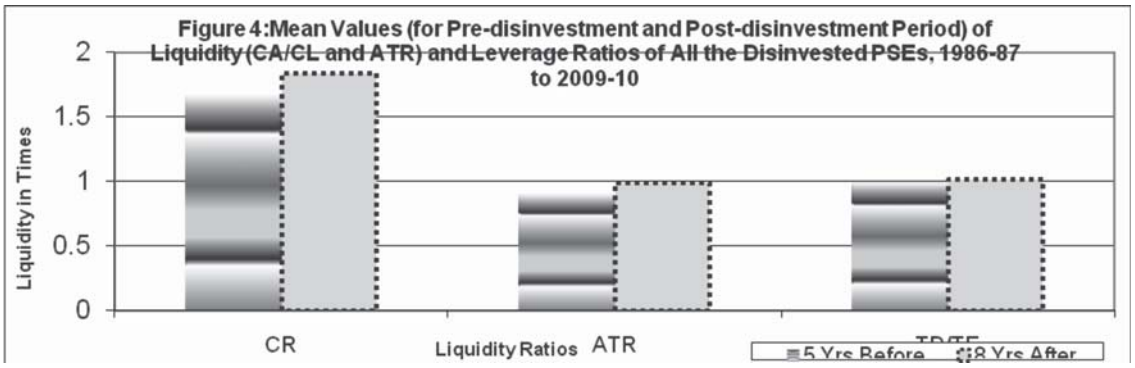
6. # Firms in bracket refers to number of firms after disinvestments and @ refer to the ratios to be calculated in number of days.
7. ! represents to be calculated in percentage.
8. CR- current ratio, ATR- acid test, ratio, TD/TA-total debt/total assets, TD/TE- total debt/total equity, TATR-total assets turnover ratio, FATR- fixed assets turnover ratio, CATR-current assets turnover ratio, DCP- debtors Collection period, RMIHP- raw materials inventory holding period, WIPIHP- work-in progress inventory holding period, FGIHP-finished goods inventory holding period, ROTA- return on total assets, ROCE-return on capital employed, RONW- return on net worth, OPM- operating profit margin, NPM- net profit margin, NIE- Net Income Efficiency and Sales Eff.- sales efficiency.
9. CR consisting value 6 and above, ATR- 4 and above, TD/TA- 1 and above, TD/TE-6 and above, RMIHP-0, 366 days and above, DCP- 0, 270 days and above, TATR- 5 and above, CATR-6 and above, FATR 12 and above, RONW- plus/minus 60 per cent, ROCE- plus/minus 50 per cent, ROTA- plus/minus 35 per cent, OPM- plus/minus 50 per cent and NPM- plus/minus 40 per cent are eliminated.

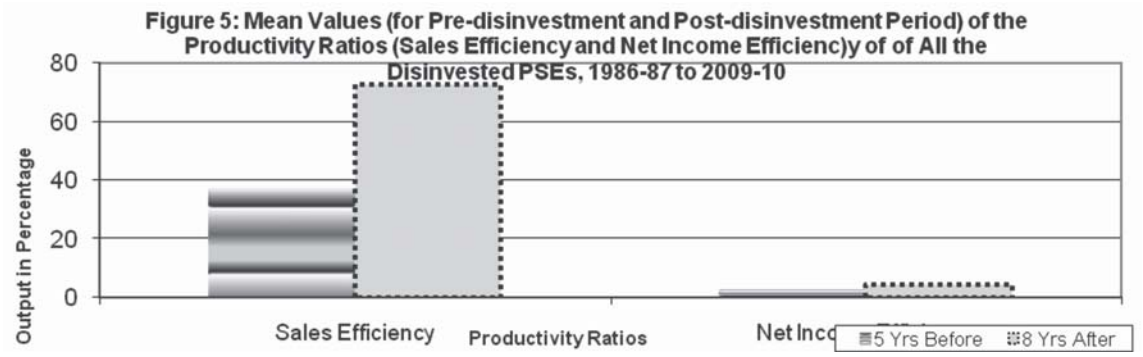
These points hold true for other Tables mentioned in this section and in other sections.











Further, there is a solace that RMIHP (a variant of inventory efficiency), WIPIHP, and FGIHP have also shown a marginal decline (statistically significant in the case of FGIHP) in holding days of inventory after disinvestment. The median and lower quartile values have also almost replicated to the mean results. It is hypothesized that disinvestment would pave way for better capacity utilization. However, the actual findings are not in conformity with this normal expectation. For instance, capacity utilization of more than four-fifth (23 out of 29) of the PSEs have shown a declining trend (though not statistically significant) after disinvestment (Table 2).

Table 2: Mean Values of Capacity Utilization Ratio of the Public Sector Enterprises (PSEs) Opted for Disinvestment, 1986-87 to 2009-10

(Figures are in percentage)

Capacity Utilization Ratio	No of firms Before (After)# 1	Mean Five years Before disinvestment 2	Mean Five years After disinvestment 3	Change in Mean 3-2	Paired t test for difference of Mean 4	degree of freedom (df) 5	Firms showing better performance (%) 6	Significance level 7
Below 50 %	2(2)	82.7	46.0	-36.7	36.70	1	0	0.48
More than 50 and less than 75%	8(8)	83.6	78.1	-5.5	5.50	7	63	0.47
More than 75 and less than 100%	13(13)	83.8	84.8	1.0	-0.98	12	70	0.78
More than 100%	6(6)	95.4	100.9	5.5	-5.50	5	83	0.42

Firms in bracket refer to number of firms after disinvestment

Findings are equally revealing in nature for the profitability and efficiency point of view during the period of the study. In fact, the number of such firms showing deterioration in ROR is half or more in the second phase compared to the first phase. Likewise, there is a decrease in all major efficiency ratios (save Inventory holding period, IHP); in fact, large number of firm's are displaying deteriorating performance *vis-à-vis* the number of firms showing improvement during the same tenure (Table 3). Therefore, the findings do not support the hypothesis of improvement in financial performance of disinvested PSEs after disinvestment *vis-à-vis* before disinvestment (in sizeable number of cases).

Table 3: Disinvested PSEs showing Improvement or Deterioration in Performance (Measured in terms of Profitability and Efficiency), 1986-87 to 2009-10

Variables	No of firms Before (After)#	Firms showingImprovement in Performance (in %)	Firms showing Deterioration in Performance (in %)
Profitability			
ROTA	38(38)	37	63
ROCE	38(38)	35	65
RONW	38(38)	35	65
OPM	38(38)	45	55
NPM	38(37)	55	45
Efficiency			
TATR	37(37)	57	43
FATR	35(35)	51	49
CATR	37(37)	38	62
DCP	38(38)	44	66
RMIHP	30(35)	62	38
WIPIHP	27(27)	63	37
FGIHP	31(31)	72	28

Firms in bracket refer to number of firms after disinvestment.

These findings are in conformity with other notable studies on the subject. For instance, Bishop and Kay (1989*)* have found no strong evidence that indicate the privatized firms did better. Likewise, Abelson (2003) derived out of his nine case studies that long-term financial returns played very little part in the decision to privatize; there is a consistent pattern of winners and losers from the privatization; the winners were the financial institutions, the new shareholders and private consultants and the main losers were the workers in the presale organizations and future taxpayers. Gupta et. al. (2011) have stated that recession (landed in September 2008) has not much impacted to their performance of these enterprises.

On the Basis of Degree of Disinvestment

Dewatripont and Roland (1992*)* and Zsuzsanna, Kose and Abraham (1996) have examined the dynamics of privatization and provide an explanation for the different patterns of evolution of private ownership; they are able to distinguish characteristics of privatization in stages (experimentation) from those of partial privatization. Proponents of gradual privatization (Roland, 1994; Katz and Owen, 1995) claim that gradual privatization can make the transition process smoother and less painful and at the same time, increases the chance for strong economic progress by taking advantage of the 'learning by doing' effect. Naib (2004) states that divestiture will result in shifting the objectives of owners and type of incentive systems for management.

The disinvestment in stages raises certain quarries, such as, whether higher disinvestment produces higher profitability or not? To what extent, operational efficiency is related to the percentage of disinvestment? i.e., to what extent greater disinvestment generates higher liquidity, profitability and effective utilization of existing resources? Therefore, the objective of this section is to assess the impact of gradual disinvestment (or degree of disinvestment) on performance of the central PSEs.

H3: It is hypothesized that the higher quantum of disinvestment would yield better operating and financial performance.

The impact of disinvestment has been measured by dividing degree of disinvestment into six segments, i.e., out of total share capital the percentage of disinvestment a) up to 5 per cent, b) between 5 to 10 per cent, c) between 10 to 20 per cent, d) between 20 to 30 per cent, e) between 30 to 40 per cent and f) between 40 to 50 per cent; the corresponding number of disinvested PSEs are 9, 8, 7, 4, 6 and 4 respectively. For each segment, mean values have been computed (on before-after basis) for all the ratios. ANOVA test has also been applied to determine the relations among them.

Disinvestment up to 5 per cent

The decrease is substantial in all the parameters of profitability and marginal in almost all efficiency ratios during the post-eight years of disinvestment *vis-à-vis* five years before (pre-disinvestment phase, as per Table 4). Leverage (TD/TE) ratio has also shown a marginal increase. However, capacity utilization of these enterprises has revealed the positive results, nearly 90 per cent of these enterprises have enhanced their capacity utilization; it, in turn, would have moderately and positively impacted to the inventory holding period of these enterprises. In sum, no improvement due to disinvestment has been observed except in RMIHP, FGIHP, leverage, sales efficiency and NIE after disinvestment.

Disinvestment in the range of 5 to 10 per cent

On the contrary, disinvested PSEs in the range of 5 to 10 per cent (as per Table 4) have shown unfavorable performance in all the parameters of profitability and efficiency; the decrease in profitability, assets turnover and capacity utilization has been observed in the post disinvestment phase *vis-à-vis* pre-disinvestment phase; it would have adversely impacted the holding period of inventory and DCP, as an increase has been observed in holding periods of raw material and DCP after disinvestment. The only positive notable features have been in respect of increase in productivity (in terms of sales efficiency and NIE) and liquidity during the similar time frame.

Moreover, there has been no improvement in these enterprises due to higher disinvestment. The findings in the sub-section indicate that minor increase in the percentage of disinvestment (of 5 to 10 per cent) does not yield better performance of disinvested PSEs.

Table 4: Mean Values of Key Financial Ratios of the PSEs on the basis of Extent of Disinvestment below 5 per cent, between 5 to 10 per cent and between 10 to 20 per cent, 1986-87 to 2009-10

Ratios	Disinvestment below 5%			between 5 to 10 %			between 10 to 20 %		
	No of firms Before (After)#	Mean 5 yrs before and 8 yrs after of disinvestments		No of firms Before (After)#	Mean 5 yrs before and 8 yrs after of disinvestments		No of firms Before (After)#	Mean 5 yrs before and 8 yrs after of disinvestments	
		Before	After		Before	After		Before	After
Profitability Ratios (in percentage)									
RONW	9(9)	11.75	6.99	8(7)	11.18	7.58	7(7)	12.73	12.62
ROCE	9(9)	10.61	6.94	8(7)	11.19	5.89	7(7)	10.50	13.42
ROTA	9(9)	11.35	8.16	8(8)	10.40	6.27	7(7)	9.61	12.34
OPM	9(9)	14.78	10.96	8(8)	14.26	7.24	7(7)	16.93	17.89
NPM	9(9)	8.62	5.29	8(7)	6.96	6.48	7(7)	9.89	9.60
Efficiency Ratios (in times)									
TATR	9(9)	1.06	1.00	8(8)	1.15	0.92	7(7)	0.96	0.91
FATR	8(8)	2.94	2.82	8(8)	3.74	3.45	7(7)	3.11	2.72
CATR	9(9)	1.70	1.60	8(8)	1.86	1.34	7(7)	1.92	2.05
• DCP (in days)	8(9)	56.49	70.67	8(8)	83.32	105.10	7(7)	41.88	35.49
• RMIHP (in days)	7(9)	209.65	148.85	6(5)	84.59	138.13	5(6)	153.28	159.84
• WIPIHP (in days)	6(6)	21.58	22.29	7(7)	25.52	19.93	3(3)	2.02	2.72
• FGIHP (in days)	7(7)	26.54	23.30	7(7)	36.87	25.21	5(5)	31.75	31.36
Capacity Utilization (in percentage)									
Below 50 %	1(1)	72.8	70.2	1(1)	92.6	21.8	0		
Between 50 to 75%	1(1)	74.6	85.0	3(3)	86.6	80.3	1(1)	105.4	79.6
Between 75 to 100%	3(3)	93.9	103.5	2(2)	92.5	88.5	2(2)	70.6	79.4
More than 100%	1(1)	74.0	93.4	0			2(2)	97.1	107.6
Leverage (in times)									
TD/TE	9(9)	0.71	0.97	8(7)	1.16	1.11	7(7)	1.04	1.28
Liquidity (in times)									
CR	9(9)	2.06	2.12	8(7)	1.78	1.92	7(7)	1.46	1.67
ATR	9(9)	1.12	1.16	8(8)	0.94	1.05	7(7)	0.97	0.90
Productivity/Output									
Sales Eff. (in %)	9(9)	18.05	31.61	8(8)	28.93	47.71	7(7)	43.62	124.59
NIE (in percentage)	9(9)	1.00	1.18	8(8)	0.83	1.27	7(7)	2.37	9.87
No of Employees	9(9)	7059.1	6037.24	8(8)	10866.2	9121.09	7(7)	23258.54	21113.77

Disinvestment in the range of 5 to 10 per cent

On the contrary, disinvested PSEs in the range of 5 to 10 per cent (as per Table 4) have shown unfavorable performance in all the parameters of profitability and efficiency; the decrease in profitability, assets turnover and capacity utilization has been observed in the post disinvestment phase *vis-à-vis* pre-disinvestment phase; it would have adversely impacted the holding period of inventory and DCP, as an increase has been observed in holding periods of raw material and DCP after disinvestment. The only positive notable features have been in respect of increase in productivity (in terms of sales efficiency and NIE) and liquidity during the similar time frame.

Moreover, there has been no improvement in these enterprises due to higher disinvestment. The findings in the sub-section indicate that minor increase in the percentage of disinvestment (of 5 to 10 per cent) does not yield better performance of disinvested PSEs.

Disinvestment in the range of 10 to 20 per cent

It has been analyzed that higher disinvestment (10 to 20 per cent) has brought improvement in the financial performance of PSEs. As an increase in the profitability ratios, the primary measure of financial performance has been determined (except RONW and NPM) which is more than 5 per cent (in OPM), above 25 per cent in ROCE and ROTA during second phase compared to the first phase of disinvestment. Further, sizable increase in liquidity (CR), capacity utilization

(80% of the firms) and productivity (SE and NIE due to decrease in employment) ratios has also been observed during the same phase. However, the performance has deteriorated only in the case of efficiency measures as decrease the assets turnover and increase in inventory holding period have also been noticed.

Disinvestment from 20 to 30 per cent

The findings are contrary to the normal expectation of the better performance (in respect of profitability) with higher degree of disinvestment. Mean profitability and capacity utilization have reported a decline (Table 5). As far as assets turnover, liquidity and productivity ratios are concerned, improvement has been noted in all of them; inventory holding period (raw materials, work-in-process and finished goods) has also shown a moderate decrease.

Capacity utilization suggests that 3 out of 4 disinvested sample enterprises have decreased their capacity utilization during the second phase *vis-à-vis* first phase. It may be recalled that better performance has been observed for PSEs having disinvestment (between the ranges of 10-20 per cent). The findings in this sub-section do not reinforce the contention that disinvestment improves profitability. However, operational efficiency, liquidity and productivity position have registered a marginal improvement.

Table 5: Mean Values of Key Financial Ratios of the Public Sector Enterprises on the basis of Extent of Disinvestment between 20 to 30 per cent, 30 to 40 per cent and 40 to 50 per cent, 1986-87 to 2009-10

Ratios	Between 20 to 30%			between 30 to 40 %			between 40 to 50 %		
	No of firms Before (After)#	Mean 5 yrs before and 8 yrs after of disinvestments		No of firms Before (After)#	Mean 5 yrs before and 8 yrs after of disinvestments		No of firms Before (After)#	Mean 5 yrs before and 8 yrs after of disinvestments	
		Before	After		Before	After		Before	After
Profitability Ratios (in percentage)									
RONW	4(4)	10.98	7.65	6(6)	19.43	20.09	4(4)	17.82	11.91
ROCE	4(4)	15.09	8.47	6(6)	22.61	22.06	4(4)	19.72	14.57
ROTA	4(4)	10.03	8.67	6(6)	16.88	16.04	4(4)	13.87	11.55
OPM	4(4)	16.10	10.68	6(6)	13.76	13.75	4(4)	18.99	15.74
NPM	4(4)	7.53	3.12	6(6)	7.10	8.32	4(4)	9.79	8.80
Efficiency Ratios (in times)									
TATR	4(4)	0.63	0.82	5(5)	1.46	1.24	4(4)	1.18	1.13
FATR	4(4)	2.45	3.92	5(5)	4.48	4.84	4(4)	3.22	2.56
CATR	4(4)	1.23	1.35	6(5)	2.63	2.24	4(4)	2.56	1.88
• DCP (in days)	4(4)	95.62	102.63	6(6)	66.34	61.53	4(4)	26.69	42.25
• RMIHP (in days)	4(4)	205.75	185.63	5(6)	118.12	84.16	3(3)	90.57	74.15
• WIPIHP (in days)	4(4)	45.88	35.18	4(4)	27.60	30.91	3(3)	10.68	8.30
• FGIHP (in days)	4(4)	37.71	30.99	5(5)	12.36	12.89	3(3)	22.86	21.10
Capacity Utilization (in percentage)									
Below 50 %	0			0			0		
Between 50 to 75%	1(1)	67.8	69.8	1(1)	79.0	64.5	1(1)	82.2	84.8
Between 75 to 100%	1(1)	79.6	53.8	3(3)	74.8	74.0	2(2)	89.0	90.4
More than 100%	2(2)	96.2	85.9	1(1)	111.8	125.0	0		
Leverage (in times)									
TD/TE	4(4)	1.01	1.09	6(6)	0.84	0.71	4(4)	1.34	0.89
Liquidity (in times)									
CR	4(4)	1.85	1.95	6(6)	1.34	1.66	4(4)	1.22	1.51
ATR	4(4)	0.81	0.88	6(6)	0.84	1.11	4(4)	0.41	0.63
Productivity/Output									
Sales Eff. (in %)	4(4)	43.62	124.59	6(6)	96.79	221.53	4(4)	23.18	88.54
NIE (in %)	4(4)	0.62	0.75	6(6)	7.88	16.87	4(4)	0.94	2.37
No of Employees	4(4)	16242.4	16812.09	6(6)	17427.7	12852.81	4(4)	52115.80	45896.50

Disinvestment in the range of 30 to 40 per cent

Table 5 indicates mixed results; marginal decrease in operational efficiency has been observed virtually in majority of the parameters of assets turnover ratios; capacity utilization of the resources has also decreased in four-fifth of the sample PSEs. Though, figures related to the leverage, liquidity, RMIHP, DCP and productivity (sales efficiency and NIE) ratios have shown better results after disinvestment; similarly, marginal increase in two profitability ratios (RONW and NPM) has also been recorded.

Disinvestment from 40 to 51 percent

A significant increase in productivity and marginal increase in liquidity ratios and capacity utilization has been seen in the post-disinvestment phase *vis-à-vis* pre-disinvestment phase; in the same way, decrease in the inventory holding period (in respect of all types of inventories) has been observed during the same time frame. Though, assets utilization and profitability has disclosed a declining trend in all types of ratios. Though, the mean capacity utilization of the sample PSEs are operating at their capacity below 100 per cent.

As far as financial performance relating to the six groups are concerned, mixed results have been observed among all the six groups related to the degree of disinvestment and various parameters of financial performance. For instance, there has been a marginal improvement in few parameters of profitability in few of the cases. The position of liquidity, leverage and efficiency ratios have shown an improvement due to higher amount of disinvestment in majority of the cases. Other parameters, such as, assets turnover (current as well as fixed, save 20 to 30 per cent disinvestment) have pronounced declining trend and DCP have reflected increasing trend.

The findings in this part contradict to the perception that higher disinvestment brings out higher efficiency or effectiveness in utilization of resources, which, in turn, raises profitability at all the levels. Further, to examine the relationship and impact of degree of disinvestment among the six groups, one way analysis of variance (ANOVA) test has been conducted (Table 6); it has identified the significant difference in almost all the parameters of profitability (except OPM and NPM), efficiency (i.e., assets turnover, IHP and DCP) and liquidity ratios. The findings, to a marked extent, corroborate the hypothesis that better performance is associated with higher degree of disinvestment.

CONCLUDING OBSERVATIONS, RECOMMENDATIONS AND IMPLICATIONS

Concluding Observations

The findings indicate that disinvestment brings no major improvement in the parameters related to the profitability, assets turnover and capacity utilization even after eight years of disinvestment. Though, improvement has been noted in respect of productivity of capital and liquidity only. In fact, findings are not in conformity with normal expectations that disinvested PSEs perform better, probably high government involvement and lesser autonomy could be one of the factors of low performance. The others may be, low profit margin, competitive environment, administrative prices control and decline in usage of debt have been listed as the probable reasons for decrease in profitability of disinvested PSEs (Gupta et. al (2011); under partial disinvestment, control continues to remain with government and hampers faster decision-making which lead to an adverse impact on the performance of PSEs.

However, extent of disinvestment has shown mixed results in the parameters of profitability across the six groups. No uniform pattern has been observed. The position of liquidity, leverage, inventory holding period (IHP) and productivity have shown improvement to a large extent due

Table 6: ANOVA Results of the Disinvested PSEs on the basis of Degree of Disinvestment, 1986-87 to 2009-10

Parameters		Sum of Squares	df	Mean Square	F	Sig.
RONW	Between Groups	175.97	5	35.19	5.15	0.04*
	Within Groups	41.04	6	6.84		
ROCE	Between Groups	287.13	5	57.43	5.71	0.03*
	Within Groups	60.37	6	10.06		
ROTA	Between Groups	87.38	5	17.48	4.92	0.04*
	Within Groups	108.70	11			
OPM	Between Groups	69.66	5	13.93	1.60	0.29
	Within Groups	52.37	6	8.73		
NPM	Between Groups	27.70	5	5.54	1.99	0.21
	Within Groups	16.66	6	2.78		
TATR	Between Groups	0.44	5	0.09	7.22	0.02*
	Within Groups	0.07	6	0.01		
FATR	Between Groups	4.85	5	0.97	3.91	0.06
	Within Groups	1.49	6	0.25		
CATR	Between Groups	1.82	5	0.36	4.73	0.04*
	Within Groups	0.46	6	0.08		
RMIHP	Between Groups	21043.05	5	4208.61	6.01	0.02*
	Within Groups	4200.76	6	700.13		
WIPIHP	Between Groups	1865.91	5	373.18	27.41	0.00**
	Within Groups	81.68	6	13.61		
FGIHP	Between Groups	644.33	5	128.87	7.92	0.01**
	Within Groups	97.57	6	16.26		
DCP	Between Groups	7285.55	5	1457.11	16.97	0.00**
	Within Groups	515.33	6	85.89		
TD/TE	Between Groups	0.27	5	0.05	1.83	0.24
	Within Groups	0.18	6	0.03		
CR	Between Groups	0.73	5	0.15	7.52	0.01**
	Within Groups	0.12	6	0.02		
ATR	Between Groups	0.44	5	0.09	7.32	0.02*
	Within Groups	0.07	6	0.01		
Sales Efficiency	Between Groups	28524.12	5	5704.82	2.53	0.14
	Within Groups	13521.43	6	2253.57		
NIE	Between Groups	216.24	5	43.25	3.72	0.07
	Within Groups	69.68	6	11.61		

to higher disinvestment. ANOVA test has also corroborated positive relation between the quantum of disinvestment with higher financial performance.

In sum, it is worth stating that partial disinvestment has not derived the results which was expected from them; it may be virtually due to number of problems faced by PSEs even after disinvestment, such as inefficient, high cost and non-competitive industrial structure, operational inefficiency due to high governmental interference, environment restrictions (delegation of operational and functional autonomy to the managers through performance contracts), less disinvestment (for filling fiscal deficit gaps) and capital market discipline. Sueyoshi (1998) enumerates that the performance and corporate behavior of a firm cannot be determined only by its ownership but also by many external factors including type of corporate environment (regulations and deregulations) and types of client (government or private firms); public firm facing serious competitors may behave as private firm and a privatize firm under government regulation may still function like public firm. Koen (1998) has suggested that privatization alone

is not the answer of good governance; managerial skills, the existence of performance incentives, transparency and a sound legal system are also required. Abelson (2003) stated that long-term financial returns played very little part in the decision to privatize. Das (1999) expresses that contrary to expectation, profitability, liquidity and assets turnover dropped instead of improving.

Recommendations of the Study

It is recommended that the government henceforth should aim for strategic disinvestment; as small and modest sizes of disinvestment are not likely to be fruitful. The government's intervention in the operational functioning and managerial decision-making should be a matter of last resort; disinvested public enterprise needs major structural changes including replacement of leadership, existence of performance incentives, transparency and education to managers in order to successfully shift to competitive firm.

The government should adopt a selective policy in the case of closing the loss-incurring PSEs. It is understandable that for social reasons, the government normally finds difficult to close the sick/loss-incurring PSEs. The government may sell such PSEs to private sector. For the purpose, it may invite tenders from the private sector. Obviously, in some cases, it may be very difficult to sell them at positive price. Since, the condition would be to run them in future; it may sell them with minimum negative tender price as followed in Germany (Gupta, 2005).

Implications of the Study

The research should be of value to the academicians, government, policy makers, management of the public sector enterprises and international development agencies. The study suggests strategic disinvestment since small amount of disinvestment or partial disinvestment do not yield desired results in majority of the cases.

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Measuring Effect of Supply Chain Design on Firm Performance Using Bayesian Networks

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Abstract

The profitability of a firm depends significantly on Supply Chain Design of a firm and it can be measured using the SCOR metrics. So it is important to understand the various factors that quantify the SC design of a firm. Identifying the most important factors which lead to affect firm's performance significantly would help to make strategies which would help to improve firm's performance. The paper aims to design a Bayesian model using the variables of the SCOR metrics and effect of these variables on firm's revenue. Bayesian belief network (BBN) modeling are used to provide a framework for measuring impact of SCOR metrics variables on firm's revenue. Bayesian methodology provides the reasoning in causal relationship among various variables and incorporates the both objective and subjective data.

This paper presents a causal relationship among various variables in a SCOR metrics and firm's revenue. The most important factor which largely affects the firm's revenue is Return On Assets and is quite intuitive. Other Factors, On time and in full, Perfect order delivery order fulfillment lead time, supply chain response and COGS to have small impact on revenue.

Capability of Bayesian networks while modeling in uncertain conditions, provides a prefect platform for analyzing the risk factors. BBN provides a more robust method for studying the impact or predicting various risk factors.

The major contribution of this paper is to develop a quantitative model for SCOR variables effect on firm's revenue. This model can be updated when a new data arrives.

Keywords: Supply Chain, SCOR Metrics, Bayesian networks.

Introduction

A supply chain consists if all the parties and people involved in fulfilling customer request directly or indirectly (Mentzer, 2001). A supply chain includes the suppliers, manufacturer, transporters, warehouses, customers and retailers. In short, a supply chain is a system comprising of people, technologies, organizations, information, resources and activities involved in moving products or services from suppliers to customers (CSCMP, 2012).

Supply Chain Council developed the Supply Chain Operations Reference Model (SCOR). SCOR model has been very effective in measuring the performance of supply chain(SC) design of the firm. The variables of the SCOR metrics are very important indicators of the SC design.

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This paper will try to provide a modeling approach to find the effect of the variables of the SCOR metrics on the firm's revenue. In order to understand the causal links between various variables of the SCOR metrics and the firms revenue, a Bayesian Network(BN) is developed in which every variable of a SCOR metrics is presented as a node with directed links forming arcs between the variables as dependent factors and firm's revenue as independent factor. The presentation of the interactions among the variables as independent factors and firm's revenue as dependent factor is the key point of BNs and allows the identification of factors which have major impact on the firm's revenue.

Potential advantages of Bayesian Networks compared with other approaches (Network Based Approaches, Principal-Agent Approaches, Behavioral Approaches, Stochastic Models) to modelling SCOR metrics variables include the compact representation, the robustness to small alterations of the model, the ability to operate with different variable types, the facilitation of prior knowledge, the ability to handle incomplete data sets, and a form of learning can be used. A security risk analysis model using Bayesian network was proposed by Feng et al. (2014). In the following paper in section 2, we present the study about SCOR and its significance. In section 3, we provide a brief overview of Bayesian belief network (BBN) modeling. In section 4, we present the details of our model. In section 5, proposed model is tested through a illustrative example, and present the results and sensitivity analysis to identify the critical variables in SCOR model. In section 6, we provided the managerial implication and limitations of this research study. The last section of the paper discusses the conclusions and future scope of research.

Literature Review

A firm is accountable to its shareholders, customers, and stakeholders. Sustainability and predictability of business outcomes derive the real or perceived value of the business (Sushil, 2016). The SCOR is very helpful in refining strategy, making the structure, processes management, and performance measure. An organization's annual strategic priorities are perceived in SCOR's horizontal process integration with its vertical process integration.

Organizations that used SCOR to improve their supply chain to redesign process, or business process engineering, have shown that SCOR is an effective enabler for aligning an organization's portfolio of improvement projects with strategic goals and objectives (Lockamy & McCormack, 2004). SCOR is highly effective in solving top five supply chain challenges viz. superior customer service, cost control, planning and risk management, supplier/partner relationship management and talent.

Supply Chain Council developed SCOR, which is a non-profitable and independent corporation originated in 1996. It started just with 69 firms and now it has around 1000 members. It aims at developing a standard SC process reference model which can provide effective communication among the supply chain partners, by

- Using standardization in terminology that provides better communication.
- Using standardization in metrics to measure and compare their performances.

SCOR helps to integrate Process Measurement, Benchmarking and Business Process Reengineering in a framework (Balocco et al., 2011). SCOR is also effective in describing, measuring and evaluating supply chain configurations. It provides:

- Conceptualized framework for relationships among the standard processes.
- Standardized metrics to measure performance.
- Management practices that can produce performance.

- The standard practices for management processes.

SCOR spans:

- All the market interactions, from understanding of the aggregate demand to the fulfillment of each order.
- All the customer interactions, from order entry through paid invoice.
- All the transactions from supplier's supplier to customer's customer, including supplies, equipment, bulk product, software, spare parts etc.

SCOR does not describe each and every business process like research and technology development, product development, sales and marketing, and some elements of post-delivery customer support (Blackhurst, Scheibe and Johnson,. 2008). SCOR continues to evolve after it was developed. Industry leaders use it daily to analyze and improve the performance of their organization. It presents a very broad perspective and definitions that can be used for specific supply chain requirements of any industry or application (Lambert, Cooper and Pagh, Shibin, et al., 2016). SCOR has five primary SC attributes: Responsiveness, Reliability, Agilty, Asset Management and Costs. The SCOR can help to identify the risk elements which can occur in the supply chain of a firm. A metric is defined to analyze the impact of these risks and thus can help firms to control the severity and mitigate the disruptions (McCormacket al., 2008). External measure of supply chain responsiveness is capacity flexibility (Teichmail & Claus, 2017).

There are two types of performance attributes in the SCOR model. Responsiveness, reliability and flexibility come into customer facing performance attributes. Assets and cost come into internal-facing attributes. Following are the performance metrics under the category of performance attributes.

On Time and In Full : The delivery is on time with complete invoice.

Perfect order Fulfillment: It includes on time and in full along with other components which make it a perfect match which include perfect invoice and perfect receipt.

Order Fulfillment Lead Time: It is defined as the amount of time from the time when customer authorizes a sales order to the customer receives the product.

Supply Chain Response Time: It is defined as the amount of time it takes in which a supply chain can respond to an unplanned 20% increase or decrease in demand without any penalty in cost or service.

Total Supply Chain Management Cost: It is defined as the operational and operational costs associated with the Plan, Source, Make and Deliver SC processes.

Total Returns Management - Warranty Cost: It includes the cost associated with planned and unplanned returns of maintenance, defective .

COGS: It includes all the cost of the inventory used in making the goods and the direct labor costs used to make the goods. It does not include the indirect costs such as sales and distribution cost.

Return on Assets: Return on assets (ROA) indicates profitability of a company relative to its total assets. ROA can tell us how efficient a company's management is at using its assets to generate earnings.

Cash-to-Cash Cycle Time: It is calculated by adding the number of days of receivables outstanding to the number of days of inventory and then subtracting the number of days of payables outstanding.

Research Methodology

This study focuses at developing a Bayesian network for analyzing the various SCOR metrics within a supply chain. A thorough SCOR model review has led us to identification of various SC performance metrics. These metrics have to be incorporated in a model establishing relationship between them. Subsection 3.1 provides a brief description of Bayesian Networks.

Bayesian Networks

For the last few years, Bayesian Networks (BNs) have become an effective and popular tool for modeling of various statistical problems. BNs are quite effective in modeling complex and uncertain domains such as ecosystems and environmental management. BNs are helpful in summing the subjective beliefs with the available evidences (Chin, Tang, and Yang, 2009). A BN is a directed acyclic graph that establishes the probabilistic relationships among the nodes of interest in a problem. The representation of structural model describes the probabilistic relationships and has a model that facilitates the communication between the user and a system (Cowell, Verrall, and Yoon, 2007). Bayesian network foundation is derived from the work of the theologian and mathematician Rev. Thomas Bayes who came with the concept of conditional probability theory in the late 1700s to derive a basic law of probability which later on came to be known as Bayes theorem. There are three main inference tasks for Bayesian networks.

A BN for a set of variables say U = {Y1,. . . ,Yn} is a pair, BN = (Gr, H) where Gr represents the directed acyclic graph and H tells about the parameters with which we quantify the network. The variables make the vertices and the child - parent relationship between these variables forms the edges. If an edge is there from Yi to Yj, then Yi is called the parent of Yj and Yj is called the child of Yi. A node without any parent node is called the root node and a node which had no child node is a leaf node or we can also say an outcome node. It is very important to note there is no difference between a variable and a node in BN, and these nodes can be continuous or discrete. Each node contains one of its states for a discrete variable which might not be known to the decision maker. State is nothing but explains all the possible values that a variable might take. A variable Yi and its parent, parent(Yi), tells the conditional probability distribution, P(Yi|parent(Yi)). Conditional probability table for a set of variables is formed by this. The more are the number of states of a parent node the more is the complexity of the CPT. BN can be used to understand how the change in the probability of one variable changes the probability of others. If the joint probability function of the variables are known, P(U) = P(Y1, . . . , Yn), we can find the answer to this question by finding the marginal distribution of a variable, P(Yi), or finding the conditional distribution of Yi provided we the evidence, e, P(Yi|e).

Evidence is nothing but simply means that the variables are observed and their values come from their respective domains. Calculating P(U) for a large network is quite complex as P(U) grows exponentially as the number of nodes are increased. The BNs are extremely helpful as the importance of BNs lies in the fact that by using Bayes theorem, we can not only find just the probability of child if we are given the values of the parent nodes, but if the probability of the children are given we can find the probability of the parents. Bayes' theorem states that:

BNs can be applied both ways like: Top Down, that is it can be used as a predictive modeling and Bottom Up, that is it can be used for diagnosis. Thus, we can not only find the consequences given the causes, but can also get the probabilities of various causes given the consequences.

One of the most important features of BNs is that we can facilitate flexible results with partial information (Zeng and Sycara, 1998). Correspondingly, the concept of BNs has become very popular in areas of medical diagnosis, safety science and weapon tracking systems.

Parameter learning

We need to specify the probability distribution for each node X conditional upon X's parents in order to fully specify the BN. Since the distribution of X conditional upon its parents may take any form. It might help to use Gaussian distribution or discrete distribution since it may simplify calculations. One can use the principle of maximum entropy to determine a single distribution in case only constraints on a distribution are known, the one with the greatest entropy given the constraints. We can estimate the parameters using the maximum likelihood approach of conditional distributions which are sometimes unknown. It becomes very complex to directly maximize the likelihood if there are unobserved variables. We can solve this problem by using the expectation-maximization algorithm which alternates computing expected values of the unobserved variables conditional on observed data, with maximizing the complete likelihood (or posterior) assuming that previously computed expected values are correct. Under mild regularity conditions this process converges on maximum likelihood values for parameters.

Structure learning

Machine learning can help to automatically generate the graph. Rebane and Pearl (1987) gave the basic idea of recovery algorithm. The complete idea depends on the difference between the three types of adjoining triplets possible in a DAG:

1. $X \rightarrow Y \rightarrow Z$
2. $X \leftarrow Y \rightarrow Z$
3. $X \rightarrow Y \leftarrow Z$

1 and type 2 shows the same dependencies (If is given X and Z are independent). However, 3 is different and we can be uniquely identify it as and are independent to some extent and all other pairs are dependent. So, even when structure of these triplets are same, the direction of the arrows can be partially identified. The same difference can be applies when and common parents but we must first condition on the parents. There are algorithms which we can us to develop skeleton of the graph and can thus can change the orientation of all arrows whose directionality is dictated by the conditional independencies observed.

There is yet another method in which we focus on the sub-class of decomposable models to get the structure, for which the MLE have a closed form. This method is very helpful using which we can to develop a consistent structure for a large number of variables.

We can make a BN with the help of rule-based machine learning . New rules can be generated and new nodes can be created using Inductive logic programming. Statistical relational learning (SRL) approaches use a scoring function based on the Bayes network structure to guide the structural search and augment the network.

Bayesian Belief Network modeling steps

The following diagram represents the methodological steps used in this study.

Implementation of Bayesian belief networks (BBN) modeling requires factor identification and then establishing relationship between them. The first step in the BN modelling is the development of the Structure and its Evaluation on the first iteration it will give an unparameterised causal

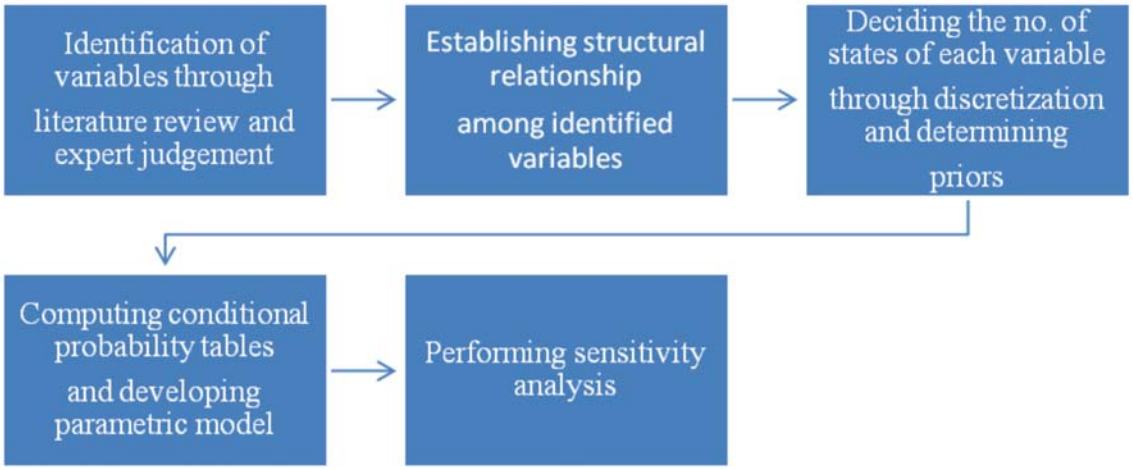


Fig. 1 Steps in Bayesian Belief Network (BBN) Model

network. This model development can be done using knowledge or data-based approach. Knowledge based model development is done through expert elicitation of parameters. The factors were identified using literature review and then prepared list was sent to experts for validation. Once relevant variables were identified, and then experts were asked to draw linkages among various risk factors, used in the study.

For establishing structural relationship among variables, Delphi method was used. Once, opinions of experts converged on a particular structure that was taken for further evaluation. The experts were supply chain managers. In step 3, before parameterization, discretize all the variables into states. In case of continuous variables, states are to be further discretized into sub-ranges. Wherever possible, states were established using guidelines, management threshold or recognized classifications. When, the guidelines were not present, sub-ranges were made with proper guidance of experts. We did not pre-determine the number of 'states' assigned to each node, but it was evaluated and assigned on an individual basis. In step 4, expert opinion is applied on conditional probability tables, rather than individual parameters. For parent variables, priors were drawn out and for child nodes; CPT was drawn out for each and every possible state for a child variable.

In the final step, Sensitivity analysis is used to find the changes in probabilities of output variables when inputs and parameters are changed. Two types of sensitivity analyses were used in evaluating the BBN. The first is, "sensitivity to findings", it is how BN's posterior probabilities change under different conditions and the second is, "sensitivity to parameters", it is how the BN's posterior probabilities change when parameters are changed. In the next section a brief overview of BBN modeling has been provided.

Research Model

This research study employs a BBN model for quantifying the impact of variables in SCOR on firm's revenue. The model consists of the already described variables of the SCOR metrics. Model shows the relationship between SCOR variables and the firm's revenue. Each node represents an independent variable and direction of the arrow signifies the relationship between them. The following diagram showing structural relationship that is known as influence diagram.

Data Collection

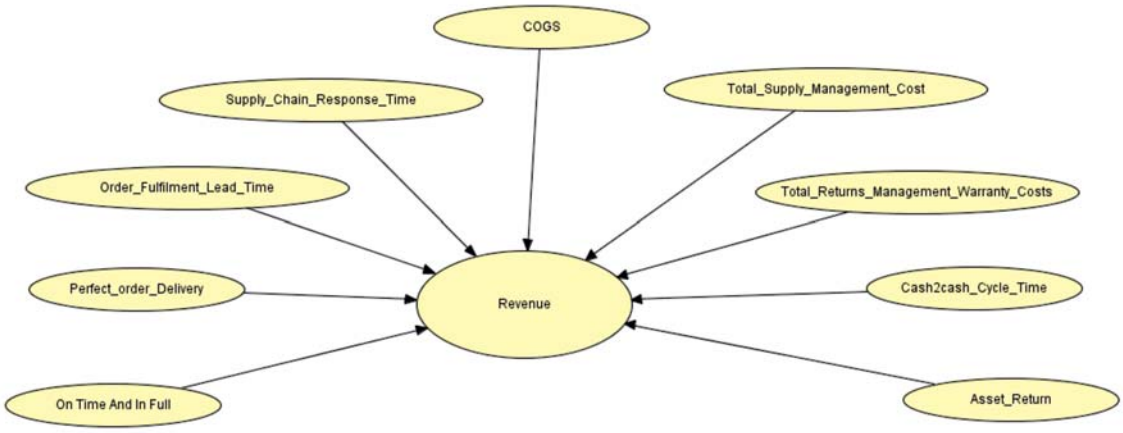


Fig. 2 : The Proposed Framework for Bayesian Network

In model structure given in Fig. 2, consideration was only given to the relationship between parent nodes and child nodes. This structure was created in consultation with subject matter experts (SME) and it is ensured that the proposed structure is the one. Next step is to draw out the past data and expert knowledge into conditional statements and probabilities.

The data sample consists of five major automobile manufacturers in India and abroad. These five companies are very large in automotive sector operating in India and abroad. The selected companies are very large and their turnover is more than 5000 cores and employee size is greater than 2000. The data collected is between the time periods of 2006-2015.

Data Analysis

Table 1 Threshold Values of Performance Indicators

SCOR Variable	Measurement Scale
On Time and In Full	• High > 79 % • Low <= 79%
Perfect Order Delivery	• High > 59% • Low <= 59%
Order Fulfillment Lead Time	• High > 28 Days • Low <= 28 Days
Supply Chain Response Time	• High > 122 Days • Low <= 122 Days
COGS	• High > 85% of Revenue • Low <= 85% of Revenue
Total Supply Chain Management Cost	• High > 14.5% of Revenue • Low <= 14.2 of Revenue
Total Return Management Warranty Cost	• High > 2.4 % of Revenue • Low <= 2.4 % of Revenue
Cash to Cash Cycle Time	• High > 130 Days • Low <= 130 Days
Asset Returns	• High > 0.10 • Low <= 0.10

The Bayesian network deals with the various variables involved in a SCOR metrics. The Bayesian network was tested for a set of data obtained for various input nodes assigning normal distribution to the rest. The BN was modeled using Hugin Lite 8.3 software. Fig. 3 shows the distributions and results obtained after simulating the model using input data for Fiat Chrysler Automobiles.

Thus, the model examines the probability of impact on company's revenue based up the firm's

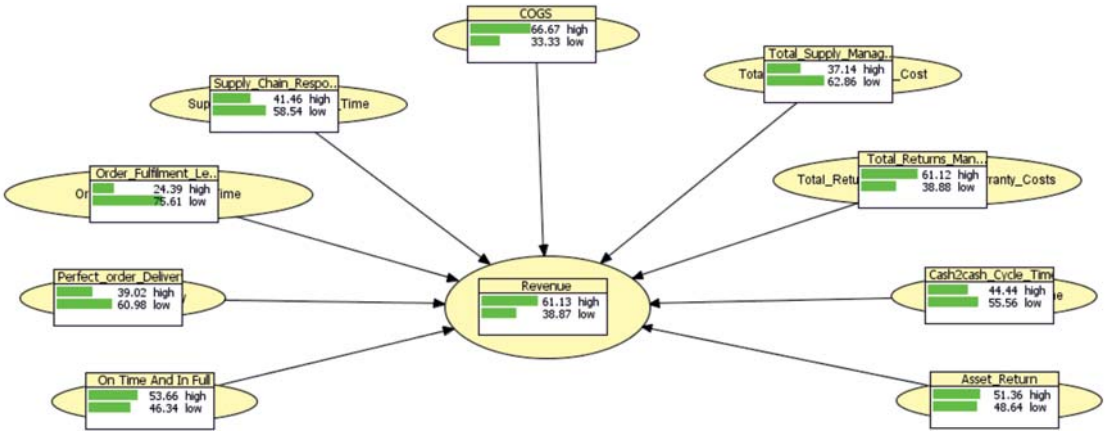


Fig. 3 The Results of the Simulation of Fiat Chrysler Done Using Hugin Lite

SCOR metrics. These prior probabilities of parent nodes were assigned using the data. Bayesian Networks can not only be used to model risk and find the impact on revenues but can also be used on a more backward approach (bottom to top) to diagnose the possible causes of variation in profitability due to information supply chain risk factors. When we know a variable's real state out of possible states in the model, we can study its impact on distributions on other modes as well.

As Fig. 4 provides the backward reasoning when provided with data such as to get high revenue, probability of Asset return is significantly increased by 9 percent as well as we see that the factors like on time and in full, perfect order delivery order fulfillment lead time, supply chain response and COGS impact on revenue is there but its low its effect is inverse which is quite intuitive. Thus it is evident that the impact on revenue is from asset return and is quite obvious which is evident from the results obtained as shown in the Fig. 4.

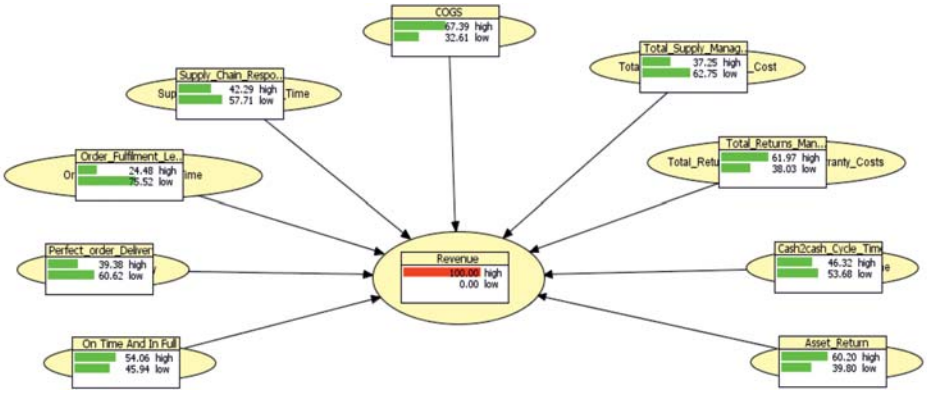


Fig. 4: Analysis of Risk Factors when results are known for Fiat Chrysler.

Table 2: Sensitivity Analysis on individual Factors for Fiat Chrysler

Factor	Change (%)	Effect on Revenue (%)
On Time and In Full	46.34	0.46 (positive)
Perfect Order Delivery	60.98	0.56 (positive)
Order Fulfillment Lead Time	75.61	0.23(positive)
Supply Chain Response Time	58.54	1.21(positive)
COGS	33.33	0.66(positive)
Total Supply Chain Management Cost	62.86	0.17(positive)
Total Return Management Warranty Cost	38.88	0.86(positive)
Cash to Cash Cycle Time	55.56	1.58 (positive)
Asset Return	48.64	10.53 (positive)

For the above case the Order Fulfillment Lead Time and Total Supply Chain Management Cost plays significant role.

Tata Motors

Fig. 5 Shows the Distributions and Results obtained after simulating the model using input data for Tata Motors.

As Fig. 6 provides the backward reasoning when provided with data such as to get high revenue,

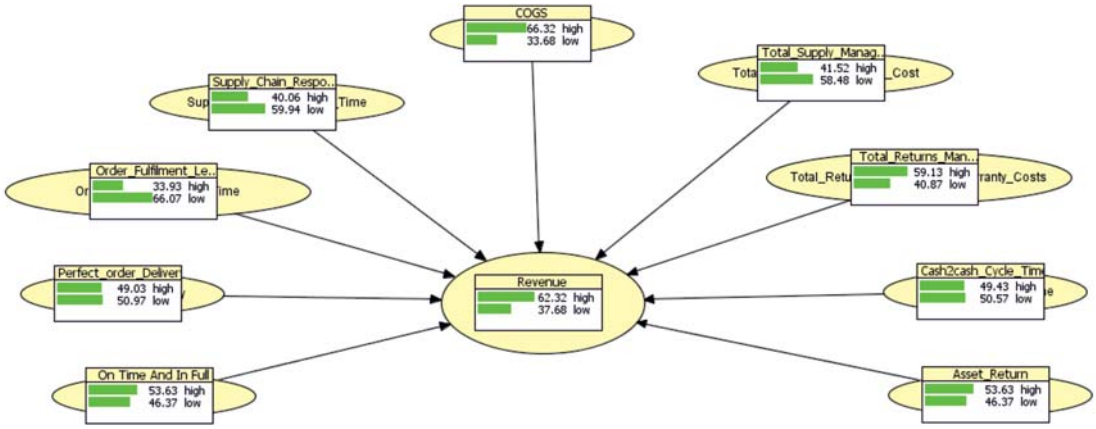


Fig. 5 The Results of the Simulation of Tata Motors Done Using Hugin Lite

probability of Asset return is significantly increased by 8 percent as well as we see that the factors like on time and in full, perfect order delivery order fulfillment lead time, supply chain response and COGS impact on revenue is there but its low and its effect is inverse which is quite intuitive. We observe that the results obtained for Tata Motors is quite similar to what we saw for Fiat.

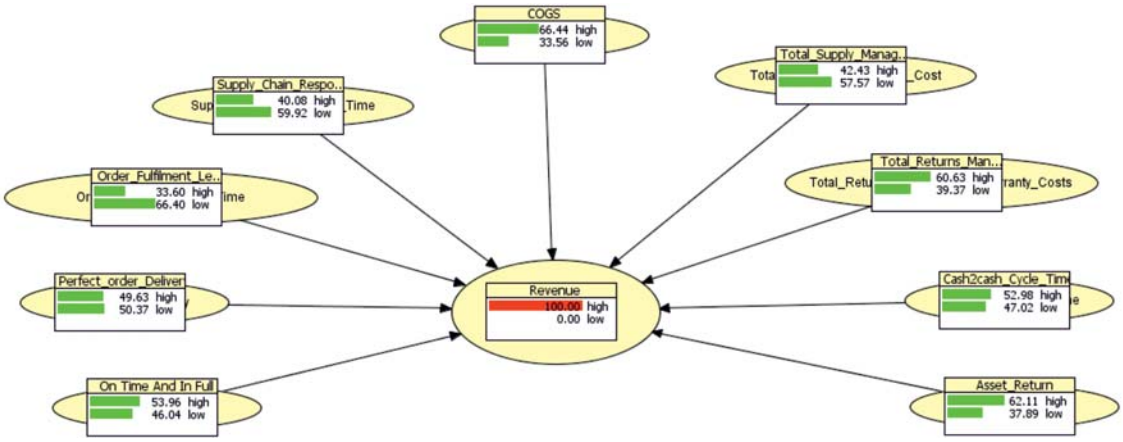


Fig. 6 : Analysis of Risk Factors when results are known for Tata Motors.

Table 3 : Sensitivity Analysis on individual Factors for Tata Motors

Factor	Change (%)	Effect on Revenue (%)
On Time and In Full	46.37	0.38 (positive)
Perfect Order Delivery	51.97	0.76 (positive)
Order Fulfillment Lead Time	66.07	0.59(negative)
Supply Chain Response Time	59.94	0.03(positive)
COGS	33.68	0.12(positive)
Total Supply Chain Management Cost	58.48	1.36(positive)
Total Return Management Warranty Cost	40.87	1.59(positive)
Cash to Cash Cycle Time	50.57	4.47 (positive)
Asset Return	46.37	9.85 (positive)

For the Tata motors case the Order Fulfillment Lead Time and Total Supply Chain Management Cost plays significant role.

Maruti

Fig. 7 : Shows the Distributions and Results Obtained after Simulating the Model using Input Data

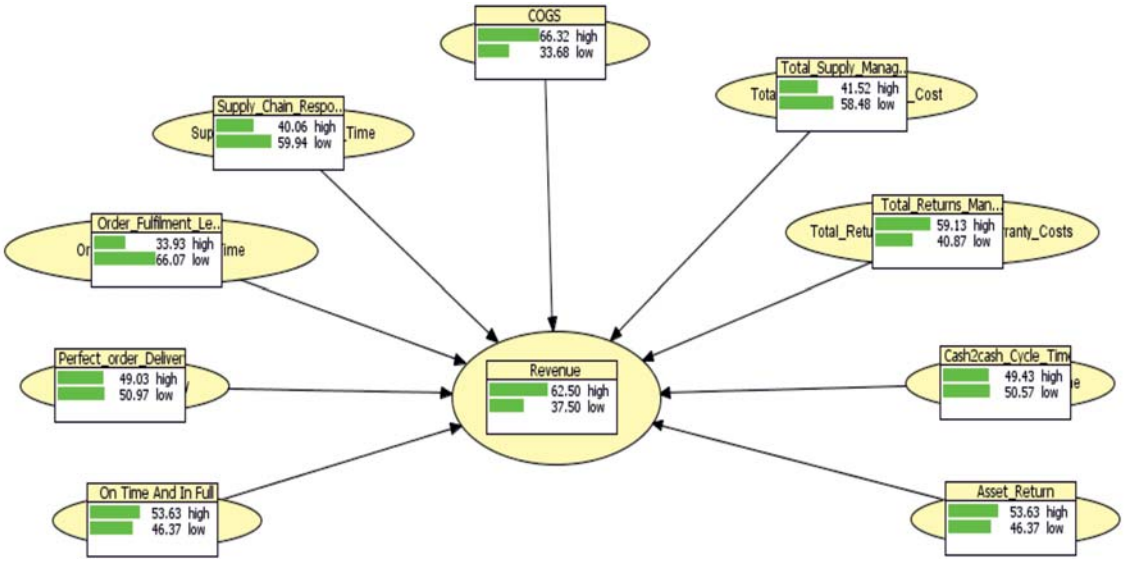


Figure 7 : The Results of the simulation of Maruti done using Hugin Lite

As Fig. 8 provides the backward reasoning when provided with data such as to get high revenue, probability of Asset return is significantly increased by 8 percent as well as we see that the factors like on time and in full, perfect order delivery order fulfillment lead time, supply chain response and COGS impact on revenue is there but its low and its effect is inverse which is quite intuitive. We observe that the results obtained for Tata Motors is quite similar to what we saw for Fiat and Tata Motors.

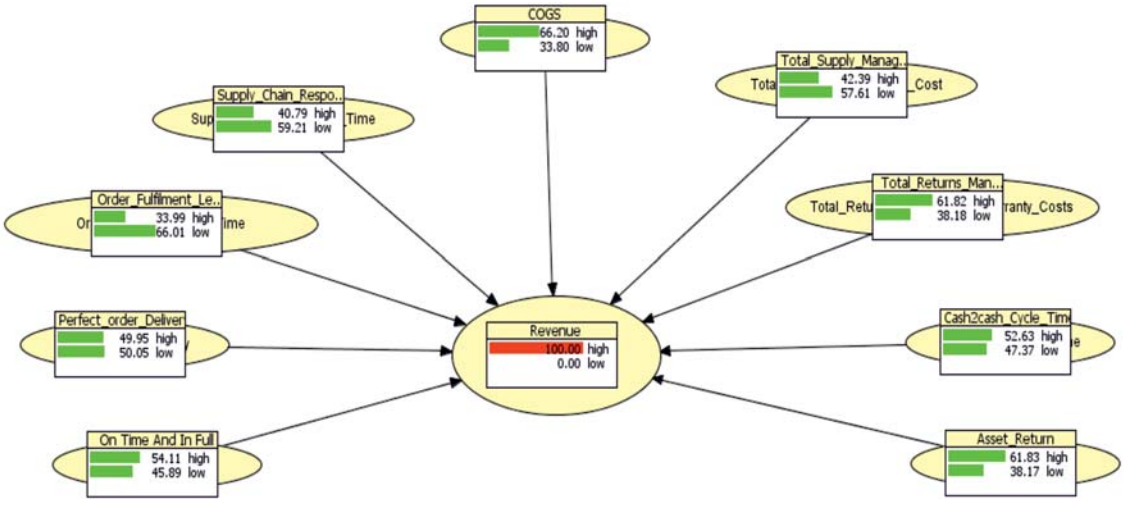


Fig. 8 : Analysis of Risk Factors when results are known for Maruti

Table 5 Sensitivity Analysis on individual Factors for Maruti

Factor	Change (%)	Effect on Revenue (%)
On Time and In Full	46.37	0.53 (positive)
Perfect Order Delivery	50.97	1.17 (positive)
Order Fulfillment Lead Time	66.07	0.11(positive)
Supply Chain Response Time	59.94	1.13(positive)
COGS	33.68	0.11(negative)
Total Supply Chain Management Cost	58.48	1.31(positive)
Total Return Management Warranty Cost	40.87	2.84(positive)
Cash to Cash Cycle Time	50.57	4.03 (positive)
Asset Return	46.37	9.55 (positive)

For the Maruti case the Order Fulfillment Lead Time and Total Supply Chain Management Cost plays significant role.

Managerial and theoretical Implication

In this research paper an SCOR metrics model has been developed using BBN. In Bayesian models, reasoning can be done in both ways. The variables in the SCOR metrics affect the revenue. The managers can study the impact using BBN. For some of the factors whose data is not readily available, their probability can be obtained from subjective data (expert's judgment). Managers can use Propagation analysis using BBN to update the probability, when new data comes. In risk analysis, probability updating is the task of calculating all the posterior marginal of non-evident variables given the evidence. Sensitivity analysis explains the importance of various variables on the SCOR metrics. We can diagnose the responsible factors using Bottom Up analysis of BBN. Results of Sensitivity analysis show that 'Return On Assets' is the most important factor along with marginal impact of Delivery Performance. As now managers know the role of individual factors they can take possible initiatives to bring about possible positive effects in revenue. As the most impactful factor is return on assets and also its quite intuitive that return on asset do affect the revenue largely. We also see here that for delivery performance also do have positive and marginal impact on revenue. The managers need to see to it that how can they improve on these factors and hence can increase the revenue.

The proposed Bayesian model very well shows the evidence based practice. The Bayesian modeling can is highly useful in test hypotheses and theories. BBN tests theories based on new evidences. This research can also help in giving directions to researchers, who want to use BBN modeling in future. This paper presents a complete practical approach for structural and parametric learning. This methodology also helps to update the posterior probabilities when new evidences come.

Limitations

The study was conducted in automobile industry; therefore, the results might be industry-specific in nature. In addition, the study examined only 3 companies in the automotive industry, thus limiting the generalizability of variables of SCOR metrics in this sector. One limitation here may

be the use of the BN methodology is the ability to access the necessary data needed to construct the Bayesian networks.

Conclusion and future scope of research

In this paper, we have proposed an assessment model for the impact of variables in the SCOR metrics on the revenue of a firm risk using Bayesian Networks. As we already discussed the capability of Bayesian networks while we model it in uncertain conditions, this helps in providing the perfect platform for analyzing the models providing a very robust method for studying the impact of various factors. The data analysis in above section shows results obtained for a study on automobile companies and the changes observed in the values of probabilities when certain data sets are known with full certainty. If the probability distribution can be made more reliable and accurate if filed and more accurate data is provided to us. One of the best features of the Bayesian Network is that we can ability to incorporate new data to change probability distribution. Hence, we can improve the predictions made in the study if we are provided with more reliable data, which is a limitation for the project. Study of SCOR metrics factors for companies and supply networks in other industries can be examined using the methodology illustrated in this study.

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Determinants of Borrowing by Poor: Evidence from Urban Slums of Mumbai in India

Shruti[1] and GC Maheshwari[2]

Abstract

The study seeks to empirically investigate the determinants of borrowing of urban slum households in Mumbai. The study is based on extensive survey of 448 urban households from six major slum clusters of Mumbai. The Heckman two stage model is used to analyse the data.The findings of this paper indicatethe significant factors influencing the probability of getting the loan and the households' loan amounts.

The study is unique as it expounds the reasons of borrowing behaviour of urban slum dwellers and can help in the effective formulation of policy or strategy for credit delivery mechanisms by the government and policymakers.

Keywords: Financial inclusion, Slum, borrowing behaviour, credit.

Introduction

Globally, the share of urban population is growing at an exponential rate. By 2050, it is expected that 66% of world's population to become urban (United Nations, 2014). The increase in urbanisation on the other hand is accompanied with rise in the urban poverty. It is seen that around 11% of the global urban population is living in India out of which 81 million people in urban India are living below the poverty line as per NSSO's 61st round data 2004-05. When we compared the poverty statistics of rural and urban counterparts in India, it is found that the number of poor in the rural areas declined by about 231 lakhs during 1993-94 and 2004-05; on the contrary, the number of poor increased nearly to 44 lakhs in urban areas. It has become imperative to focus on inclusive growth of these poor. The financial development by broadening the base and coverage of financial intermediaries can have major impact, as the "capital" is generated through this which in turn can be used for economic development.

There have been many studies in past which empirically suggests a close relationship between financial development and economic growth (Jalilian and Kirkpatrick, 2002; Abu-Bader and Abu-Qarn, 2008). The Financial development can consecutively influence the poverty reduction through increase in economic growth, thus these three are inter-related to each other (Beck et al., 2007; Odhiambo, 2009 & 2010; Jeanneney and Kpodar, 2011, Inoue and Hamori, 2012; Sehrawat & Giri, 2016). Poor generally tend to engage in microenterprise activities which help them to generate income for their households. One of the major constraint being faced by such microenterprises is the lack of access to finance as they have poor base of income and

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assets, despite the fact the poor are willing to pay high interest rates for quick access to financial services (Brandsma and Ghaouali, 1998). Thus, widening the access to financial services in some extent can help in addressing the problem of poverty.On the other hand, banks in India are generally facing many constraints in providing credit to such customers. They are experiencing the issue of credit risk, inadequate collateral, high cost of lending, legal and regulatory limitations. Further, the targets and sub-targets set by the Government under priority sector lending (PSL) for all scheduled commercial bank (SCB) has become a major difficulty. Due to growing credit default, banks are these days undergoing a severe issue of managing their non-performing assets (NPA). As per RBI (Central Bank in India) Financial Stability Report 2017, it is seen that the gross non-performing advances (GNPAs) ratio of Scheduled Commercial Banks (SCBs) ascended from 9.2 per cent in September 2016 to 9.6 per cent in March 2017. Therefore, considering the present scenario extending large amount of micro-loans can be burden rather than a profitable business to bank.

Despite this, government is making consistent efforts to extend finance to poor and destitute people through various schemes and initiatives. Pradhan Mantri Jan Dhan Yojana (PMJDY) is one such recent scheme which aims at greater financial inclusion of poor under banking system. This scheme also provides the overdraft facility to its beneficiaries up to Rs.5000. In continuation to this scheme, the Government introduces the Micro Unit Development and Refinance Agency, or MUDRA bank to 'fund the unfunded' as a statutory body to regulate and refinance Microfinance institutions under Pradhan Mantri MUDRA Yojana scheme (PMMY).The small and poor entrepreneurs are encouraged to opt for formal finance through various interventions like 'Shishu' (loan up to Rs. 50,000), 'Kishor' (loan from Rs. 50,000-5 lakh) and 'Tarun' (loan upto Rs. 5 lakhs to 10 lakh). The advantage of the same being collateral free, zero loan application fee, easy access and systematic guidelines.In 2015,to ease the access to financial services for the poor,the RBI granted licences topayment bank and small finance banks, the payment bank can though collect deposits up to Rs. 1 lakh on the other side the small banks have advantage of offering both the loans and the deposit of small businesses and farmers.

Yet, the increased presence of formal finance did not undermine the importance of informal sources. A large number of the poor relied on expensive informal sources. (Economic Survey Report, 2016-17). The credit market in India (which include both private & commercial banks and various other financial intermediaries)is highly complex and dynamic. Though, households in India's urban slums are more developed than in rural areas, still they are equally affected with changing regime of credit market. As per the latest NSSO 70th round data, it is observed that the urban households face more problems in availing loan and seems to get fewer loans from both the institutional and non-institutional credit agencies. The self-employed with low income level in urban areas generally runs micro-enterprises for which they need regular funds, 40% of urban self -employed have borrowed funds (Rajeev et al, 2017).In India, a larger part of urban population seems to be voluntarily or involuntarily excluded from the banking services (Census of India, 2011). In urban counterparts, this exclusion is mainly seen in the large pockets of poverty i.e. slums. In this context, this paper is an effort to expound the empirical suggestions on the determinants of urban household borrowing especially in slums of Mumbai. This paper can aid to broaden our understanding of the socio-economic dimensions to help the policy makers in formulating the better financial products and services aimed at financial inclusion.

The paper is organized into 4 sections. Section 2, presents the literature review into two parts: Formal finance, Informal finance and factors influencing the borrowing. In Section 3, the research methodology is presented. In Sections 4 and 5, we present the results and analysis. Finally, the conclusion in section 6 we provide the conclusion and recommendations.

Literature Review:

Globally, around half of the world's adult population (approx. 2.5 billion people) lack access to formal financial institutions. The barriers like contact cost, documentation requirements are affecting largely especially the women, poor, youth and rural household of the society (World Bank, 2014).

Financial inclusion is often defined by various authors (Hannig and Jansen 2010; Demirgüç-Kunt and Klapper 2013; Fungáèová and Weill 2014; Allen et al. 2016), which mainly highlights the significance of "access" and "use" of financial services through inclusion of unbanked poor and disadvantageous people of the society under the banking system. The access to finance plays an important role in number of ways to poor like economic empowerment and income equality (Beck and Demirgüç-Kunt 2008; Hudon, 2009; Han and Melecky 2013). The household borrow to consume against their future income to fulfil their present demands (Del-Rio and Young 2005; Kirchler et al. 2008). The debt or saving can help them to address the unforeseen shocks such as any health problems, accidents etc. and increased investment towards the productive areas like education, durable goods, home (Collins et al., 2009). Further, the access to finance has direct relationship in development of microenterprises (Dupas and Robinson 2013).

Though, it is seen that the demand for credit and consumption varies during the lifetime. As per the life cycle theory, the consumption of an individual increases up to a certain age after which they used to spend out their asset (Modigliani, 1986; DeJuan and Seater 2007)

There exists a relationship between the growth of household borrowing and the banking system liberalization, where ease of access to borrow plays a critical role (Brown et al. 2005). Therefore, it is pertinent that we examine the efficacy of credit market in India, that we will discuss in the next part of this section.

Credit Market in India

In India there exist two types of financial market i.e. formal and informal. The formal sector includes institutions like commercial banks, regional rural banks (RRB), co-operative banks, government lending institution etc. While, the informal sector includes all the non-institutional credit agencies like moneylenders, traders, landlords, friends and relatives who extend loans.

There have been many developments so far in India to strengthen the banking system. In 1949 the banking regulation was enacted to make it compulsory to all banks to obtain the banking licence for opening any new branch from Reserve Bank of India (RBI), a central bank in India. The bank nationalization in 1969 has been another milestone in Indian history to meet the growing needs of the economy, wherein fourteen largest commercial banks were nationalized to equalize the per capita access to bank and ease the credit access for the poor. Later, seven more banks were nationalized in 1980.As a result, between 1969-1990, bank branches were opened in around 30,000 rural unbanked location with no preceding formal credit institutions (Datta & Sriram, 2012). Despite this rapid branch expansion, there were many problems in credit market like limits on amount of borrowing, need of approval from RBI for lending beyond a certain limit (credit authorization scheme), strict credit control measures, low competition etc. (RBI, 2008). Therefore, a wide number of regulatory reforms were introduced in 1990 to improve the efficiency of credit market based on the recommendations of Narasimham Committee. Micro-finance wasone such programme which was introduced in 1992 to make the bank credit more accessible for poor, particularly the poor women. The Self-Help Group-Bank Linkage (SHG-BL) and Micro-Finance Institutions (MFIs) are the two-major model under the microfinance (RBI, 2008).

There were many studies which highlights the significance of credit facility in financial inclusion on socio-economic development of poor and disadvantageous people of the society (Singh & Yadav, 2012; Jiaming, 2017). Based on the recommendations of the Khan Committee setup under RBI in 2004 the need of financial inclusion was highlighted in mid-term review of the RBI policy (2005-06) with the introduction of "no-frill' account. The no-frill account provides the opportunity to a poor individual to open bank account with zero balance which was later replaced with Basic Saving Bank Deposit Accounts (BSBDA) which has feature of overdraft facility. Besides this, number of banking products and services are introduced like Kisan Credit Cards (KCCs), General Credit Cards (GCCs), usage of regional language, simplified KYC (know your customer) norms, simplified branch authorization (RBI, 2007). There are various committees constituted by government and RBI timely like Rangarajan Committee (2008), Raghuram G. Rajan committee (2009), Nachiket Mor Committee (2014) which have a greater influence in financial inclusion.

In earlier programmes, only few areas were targeted therefore, considering a wider need of financial inclusion in India, a flag-ship programme called Pradhan Mantri Jan Dhan Yojana (PMJDY) was initiated in 2014. The main purpose of this scheme is to include a large proportion of excluded population under banking system. The 6 pillars of the programmes like universal access to banking facilities, financial literacy,basic banking accounts with an overdraft facility of Rs. 5000 after six months, creation of Credit Guarantee Fund, unorganized sector Pension schemes like Swavlamban and microinsurance scheme are envisaged to be implemented under phase manner (PMJDY website). The opening of 1.8 crores accounts under this programme in a week has also been recognized by Guinness World Records. Another important feature of this scheme is that the beneficiaries can get direct subsidiaries in their bank account by linking it with the biometric details.This bank linked benefit transfers have an added advantage of addressing the issue of leakage and corruption. The current approach of the government is to promote "JAM trinity"- Jan Dhan Aadhar Mobile for better financial inclusion of poor (Economic Survey of India, 2016-17).

The major constraint affecting formal finance is the need of collateral (Yitayal, 2004;Kihimbo et al. 2012).Though this requirement is being addressed by the Government with the introduction of Micro Unit Development and Refinance Agency (Mudra) scheme which is alsoknown as 'funding the unfunded'. Under this scheme MUDRA bank formed will refinance the Micro-Finance Institutions (MFI) through Pradhan Mantri Mudra Yojana. The programme will help the small micro-entrepreneurs to get loan upto INR 10 lakhs under three main categories being named as 'Shishu' (loan upto INR 50,000), 'Kishor' (loan between INR 50,000 and up to INR 5 lakh)and 'Tarun' (loan between INR 5 lakh to INR 10 lakh) to signify the stage of growth or development (Venkatesh, 2015; Roy, 2016).

Though, there seems to be a positive relationship between financial inclusion and growth of banking system, more growth of banking system leads to more of financial inclusion (Raman, 2012; Kunt et.al, 2015). Still these interventions seem to be insufficient to satisfy the needs of poor. Poor people in developing countries generally tend to borrow from informal channels like money lenders, family and friends (Banerjee and Duflo, 2007;Kunt and Klapper 2013;Campero and Kaiser, 2013; Chen and Zen, 2017). Informal credit though involves the higher cost and financial risk (Beck and De la Torre, 2007).In India, it is seen that the conventional moneylender can charge annual interest rate between 12-150 percent, while the rate charged by the formal institutions can merely range from 6 to 20 percent on larger loans (RBI, 2011).

Though, the size of credit, interest rate, duration of loan varies from formal and informal sector, the timely repayment of loan depends largely on the terms and utilization of the credit

(Bhattacharjee & Gupta, 2014). Therefore, it becom esessential that we study the socio-economic factors affecting the borrowing behaviour of the poor households.

Factors affecting the Borrowing Behaviour

As the formal and informal finance can co-exist together in the market (Das-Gupta et al., 1989; Conning, 2001; Banerjee and Duflo, 2007; Giné, 2011). Therefore, it is important that we study on the factors influencing directly or indirectly the choice of borrowing by the people. Some of the Socio-economic factors influencing the demand for credit are mentioned in the table 1 below:

Table 1: Literature on socio-economic determinants of borrowing

Variables	Literature
Income	(Crook, 2001; Koomson et al., 2014; Pastrapa & Apostolopoulos, 2014)
Ownership of Asset (like house etc.)	(Crook, 2001;Tsai 2002; Cousin 2007; Nguyen, 2007; Thanh et al., 2015)
Family size	(Crook, 2001)
Employment status	(Crook, 2001)
Age	(Dutta and Magableh,2006 ; Mpuga 2010; Pastrapa & Apostolopoulos, 2014)
Head of household	(Dutta and Magableh,2006)
Religious beliefs or culture	(Dutta and Magableh,2006)
Saving	(Dutta and Magableh,2006 ; Tang et al. 2010)
Last loan amount	(Dutta and Magableh,2006)
Education	(Nguyen, 2007)
Distance from the bank	(Nguyen, 2007; Nwaru, 2011)
Gender	(Mckernan, 2005; Steiner et al., 2009; Nwaru, 2011).)
Financial Literacy (Awareness towards the credit sources)	(Claessens, 2006; Campero & Kaiser, 2013)

(Source: Self Author)

While, the amount of loan taken being influenced by many factors, but the rationale behind the demand for credit is best explained by the life-cycle hypothesis (Modigilani,1996), where it is stated that if income grows at a constant rate, then both aggregate private saving and aggregate private wealth will tend to grow at the same rate, the individual consumption over the life-cycle

follows the trend that people usually borrow when young, saving when in middle age, and spending down their assets in later phase of the life. In line with this theory, numerous studies provide the empirical bases to highlight the relationship between age and demand for the credit,wherein it is explained that with increase in age the demand for loan progresses but up to certain age after which the demand for loan decreases (Mpuga, 2010; Pastrapa and Apostolopoulos 2014). The individual aims at utility maximisation from their entire life-cycle consumption and consumption must be continuous even if income is discontinuous (Baranzini, 2005). So,the individual with lower saving demand for higher loan amount (Casolaro et al. 2005).

Despite many development, formal finance is still insufficient for a larger mass (Hoda and Terway, 2015; Allen et al. 2016). It is further seen that the urban households apparently face more problems in availing credit and appear to get lesser loans both from formal and informal sources (Rajeev & Vani, 2017). There were many empirical studies which tried to study the determinants of demand for credit (Zeller, 1994; Crook, 2001; Nwaru, 2011; Pastrapa and Apostolopoulos, 2014). These studies provided us various variables based on the contextual and geographical variations. As the socio–economic conditions of households vary from region to region, therefore, more such studies are needed to understand the demand for credit specific to a region.

Thus, based on the literature review above, the study strives to achieve the region-specific information on the determinants of borrowing in urban context. The methodology of this study is discussed in the next section.

Research Methodology

Data and Sample

The study involves a wide survey of 448 urban households in slum. The response rate was found to be 91.4%. The study was conducted between February 2017 to May 2017. The respondents are selected in a way that they should be above of 18 years ageand were interviewed with the structured questionnaire. In Mumbai six cluster were selected using multistage cluster sampling (Malad, Kandivali, Chembur, Vikhroli-Bhandup, Andheri and Matunga).

Empirical Model

There were many studies in past which carried out the analysis on demand for finance through the multinomial models (Dutta & Magableh,2010; Wydick et al, 2011; Pastrapa & Apostolopoulos,2014).

In this study, we examined the factors influencing the amount of household's loans of varying amount through Heckman two-stage procedure (Heckman, 1979). In the first stage, probit model is employed to study the probability of getting a loan. The probit model basically provide the probability of choosing an alternative. The equation depicting the relationship of the dependent variable with the explanatory variables in probit model is as follow:

(PL)= a YL' + eL……. (1)

In our study, the dependent variable for the stage 1 is a dummy variable depicting whether the respondent availed the loan. While in the equation (1), (PL) defines the probability of a household having a loan and YL as set of the explanatory variables (for details refer table 2) as mentioned in the equation(1).The Heckman procedure is best fitted in our study as it analyse the amount of loan accounting the sample bias. The selection bias control factor is called lambda (?) which is equivalent to the Inverse Mill's Ratio.Following the empirical equation (1), the expanded probit equation in our case is expressed is as below:

(PL) = a(0) + a (1) LOGAge + a (2) LOGAge(square)+ a (3) LOGHouse_Mem+ a(4) Employed+ a (5) LOG_Income+ a (6) HomeOwn+ a (7) LOG_YearsHouse + a(8) EDU+ a (9) GENDER+ a (10) LOG_DIST + eL ..... (2)

Table 2: Details of the independent variables used in the empirical analysis

Variable	Description of the Variable (Code)
LogAge	The natural logarithm of respondent's age
LogAge(Square)	The square of the natural logarithm of respondent's age
LOGHouse_Mem	The natural logarithm of household members number
Employed	A dummy variable with value 1 if the respondent is employed and zero otherwise (unemployed)
Log_Income	The natural logarithm of family's total monthly income measured in Rs.
HomeOwn	A dummy variable with value 1 if the dwelling has been owned and Zero in rest of the cases (Rented).
LOG_YearsHouse	A natural logarithm of respondent's number of years where th e household is presently residing
EDU	A dummy variable with value 1 if the respondent has an education above 5th class and Zero otherwise (illiterate)
LOG_Distance	Distance of nearest bank from the respondent house
GENDER	A dummy variable with value 1 if the res pondent is male and Zero for female
Loan	A dummy variable with value 1 if the respondent has availed loan in past and Zero otherwise (Not availed)
logLoan_Amt	A natural logarithm of respondent's last loan amo unt taken
Mills	The inverse Mill's ratio

(Source: Self Author)

Though, the substitute to probit model is the logit model. These models vary only in the S-shaped curve which is used to constrain probability to the (0, 1) interval.

While, in the second stage of the Heckman procedure, we tried to find out the factors influencing the amount of household's loans, which is expressed as in equation below:

Ai = bXL + eL ..... (3)

The equation (3) can be further expanded with our explanatory variables as mentioned in the figure as below:

Log_LoanAmt=b(0) + b(1) LOGAge + b(2) LOGAge(square)+ b(3) LOG_House_Mem+ b(4) Employed+ b(5) LOG_Income+ b(6) HomeOwn+ b(7) LOG_YearsHouse + b(8) EDU+ b(9) GENDER+ b(10) LOG_DIST + MILLSi + eL ..... (4)

The lambda (?) or the Inverse Mill's Ratio (MILLSi) as mentioned in the equation (4) above is already being calculated in the probit model (as mentioned in the equation 2) through the OLS regression(Dougherty 2007; Guo and Fraser 2010; Pastrapa & Apostolopoulos, 2015).

Results and Discussions

In this section, the results of the Heckman two stage procedure (Heckit Model) will be discussed in two parts i.e. Determinants of demand for credit and Determinants of factors influencing the amount of loan.

I. Determinants of demand for credit (Stage 1: Binary Probit estimation)

As shown in the table 3, out of 448 sample only 27 % households have availed loan in past.

Table 3: Frequency table showing loan availed

Loan (Availed Loan)	Frequency(Percent)
No (0)	327 (72%)
Yes (1)	121 (27%)
Total	448 (100%)

(Source: Author's estimation)

The result of binary probit regression as obtained through statistically analysis of the equation 1, is summarized in Table 4. The empirical results were found to be in line with the previous studies.The marginal effects as depicting in the table represents the change in probability for a household receivingloan when each explanatory variable is increased by one unit (Christofides et al, 1997; Arulampalam et al, 2000;).

Table 4: Probit estimations (PL) for borrowing households (n = 448)

Variables	Coefficients	Marginal effect (*)	P>|z|
Constant	-7.491(-4.55)		**0.00**
LogAge	0.192 (2.26)	0.855	0.02
LogAge2	-0.002 (-2.06)	0.133	0.04
Employed	-0.173 (-0.64)	-0.622	0.47
Home_Owner	-0.121 (-0.21)	-0.053	0.76
LogHouse_Inc	-0.504 (1.89)	0.137	0.09
YearsHouse	0.553 (9.82)	0.151	0.00
Education	0.034(0.17)	0.023	0.83
logDistBank	-.086 (-1.05)	-0.023	0.21
Gender	0.480 (2.49)	0.122	0.02
Family_Size	0.213 (2.93)	0.040	0.05
Log Likelihood	**-151.09718**		
Pseudo R2	**0.4218**		

(*) dy/dx is for discrete change of dummy variable from 0 to 1

Z statistics are presented in the parentheses (5 % significance level)

(Source: Author's estimation)

The results of the probit equation indicate that the probability of receiving loan is positively correlated with age (0.192) as when age progresses the probability of taking loan increases.On the other hand, the probability of getting loan is negatively correlated with the age square. When we see the marginal effect, it is seen that with 1-year increase in the age the probability of getting loan is increased by 0.855 times but upto an age after which it decreases by 0.133 times (marginal effect of AgeSq). This can also be supported by the life-cycle hypothesis and other studies (Zeller, 1994; Chen and Chivakul 2008; Pastrapa & Apostolopoulos, 2015), which states that the respondent tends to borrow more with age but upto a certain age after which they prefer to spend their accumulated assets or savings.

The probability of getting loan decreases with increase in household income, as the low-income households are unable to fulfil their needs and they borrow frequently (Kamleitner and Kirchler 2007; Swain 2007; Petrides et al. 2009; Pastrapa & Apostolopoulos, 2015). In our study, the probability of getting loan decreases by 0.137 times with increase in one unit of income.In Contrast, to one such study (Chen and Chiivakul, 2008) it was mentioned that an individual can demand for more credit with increases in income due to high expectations for future income in return.

The bigger family size has more consumptions; therefore, they address their requirements generally through borrowing (Swain 2007; Bending et al, 2009; Togba 2012; Fidrmuc et al. 2013), this is also evident in our study when family size increase the probability of getting loan increases.

The number of years for which the respondent resides in the same house seems to be positively affecting the demand for credit. As the social capital and network build with time can help them in getting the loan (Tang et al., 2010). However, this being contradicted in some studies where it was reported that it is negatively related to demand for credit (Crook ,1996;Mpuga;2010).

Further, the gender does affect the demand for credit positively. The probability of getting loan is more with the male rather than the female headed household, which is also being supported in some past studies (Steiner et al., 2009; Nwaru, 2011).

The variables like employment status, education, distance of bank and home ownership are found to be insignificant at 5 % significance level.

II. Determinants influencing the amount of credit (Stage 2: OLS Regression)

The result of the OLS regression is summarized in table 4. The Adj. R-squared of the estimate is found to be 56.25 %.

The study confirms that the demand for loan amount increases with the age of the respondent (7.652 times); some previous empirical surveys also indicate the similar outcomes (Fabbri and Padula, 2004; Pastrapa & Apostolopoulos, 2015).

The results display a positive correlation between the loan amount and household income, with increase in 1 % of household income could lead to 0.510 times increase in loan amount. Similar results were found in various studies (Jappelli and Pistaferri 2007; Pastrapa & Apostolopoulos, 2015).

While, the household size, and gender (or being male) have positive relationship with the loan amount(Fletschner and Carter, 2008; Steiner et al., 2009; Nwaru, 2011). The coefficient of Inverse Mill's Ratio as mentioned in table 4 for selection correction models is positive and insignificant indicating that no sample selection biases exist in our study.

While the variables like employment status, home ownership, distance from bank and education

Table 4: Estimated selection correction models for the loan amount of household (n =121)

Variables	Coefficients	P>|t|
Constant	-0.410 (-0.12)	0.00
LogAge	7.652 (0.39)	**0.**03
LogAge2	-2.982 (-0.31)	**0.**04
Employed	0.138 (0.61)	0.03
Home_Owner	0.049 (0.17)	0.86
LogHouse_Inc	0.510 (1.96)	0.05
YearsHouse	0.148 (0.28)	**0.**78
Education	-0.034 (-0.23)	0.81
logDistBank	-0.399 (2.87)	**0.**56
Gender	0.404 (2.5)	0.01
logFamily_Size	0.524 (1.46)	0.04
invMills	-0.836 (-2.41)	**0.**251
R-squared	0.602	
Adj. R-squared	0.5625	

t statistics are presented in the parentheses (5 % significance level)

(Source: Author's estimation)

are found to be insignificant in affecting the loan amount.

Conclusions

The socio-economic determinants of the borrower have been examined by two staged Heckman procedure (Heckit method). In the first stage, the probability of getting loan is studied through binary probit estimation. While, in the second stage the OLS regression was performed to study the correlation of factors with the amount of loan being taken.Those with have high income, male, larger family size and have spent a longer time in same dwelling have more probability of getting loan. The factors like employment status, education, distance from bank and homeownership are found to be insignificant from the estimates value. The results from stage-II Heckman process seems to be in cognizance with the stage-I results highlighting the significant role of age, household income, family size and being male except the number of years spent in the same dwelling. Though, the estimations are contradicting the views of other studies, where predominant factors like employment status, distance from nearby bank and home ownership seem to increase the probability of taking loan (Nguyen, 2007; Pastrapa & Apostolopoulos, 2015). Perhaps, one of the major reason for such outcome being our geographical and demographic choice of selection in the study. In urban areas like Mumbai city, access to

finance is not a major constraint.Also, having the home-ownership can help them to serve it as "collateral" for obtaining formal loan, the result of our study, thus, possibly indicate the inclination of people towards the easy collateral free informal loans instead of formal loan.

Thus, through this studywe venture to discuss some possible implications. The finding of the study could help the policy makers to make the strategies for better utilization of the formal finance by slum dwellers. The urban slum dwellers have better access to finance; and exclusion from the formal banking system is a major concern. Despite government great initiatives like Mudra Bank where the problem of collateral has been offset, people seem to be reluctant in using the formal credit. The financial awareness or literacy can play a major role in acquainting people about new and innovative financial products and schemes.The public-private partnership of financial institutions needs to be explored more for providing better credit facilities in slums.

The main concern is the fact that no single strategy is enough to support the proper utilization of credit by poor residing in urban slum dwellings.As, this study is restricted to one city i.e. Mumbai, therefore the outcomes of the study should be consideredonly as pointers in determining the factors influencing the borrowing behaviour. For generalization of the results, it is important if we check such relationships in the others urban parts of the country.

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Risk Governance Structure and Firm Level Competitiveness: Evidence from India

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Abstract

Firm's competitiveness is considered to be a primary force in deciding its fate, and as firm's working environment is fraught with risks it needs robust risk governance structures to ensure its competitiveness. Therefore, this paper attempts to examine the relationship between firm's competitiveness and quality of risk governance structures. For the purpose, the paper first develops a normative risk governance index (a measure of quality of risk governance structures) based on eleven variables; then, using the data of 429 non-financial companies that constituted NIFTY 500 index, over a 10 year period i.e. from 2005 to 2015, multiple regression model has been run. The results indicate that there is positive relation between quality of governance structure and firm's competitiveness. It is noteworthy that a number of control variables, such as, age, size, R&D intensity, leverage, growth rate, recession dummy and industry dummies have been include to ensure completeness of the model. Further, to demonstrate the robustness of results, another set of regression has been run where the competitiveness has been measured as per the widely acknowledged financial performance facet. These results lend further support to the index developed in the study as well as to the hypothesis. In view of this, the study is expected to have useful implications for companies as well as policy-makers.

Keywords: Risk governance structure, governance, competitiveness, market share, ROA, ROE, profitability

1. Introduction

Increasing volatility, uncertainty, complexity and ambiguity(VUCA) in the business world, are perpetuating risks (Benett and Lemoine, 2014).The prominent among them being the risk related to maintenance of market share(Saurina & Lopez, 2007).If the company is unable to maintain its market share, gradually it will lose value, and will eventually go out of business. Particularly, in Indian context, the thrust on foreign direct investment and schemes to encourage start-ups are surely going to result in increased competition. Therefore, competing and sustaining are the new challenges faced by the Indian firms (Haldar et al, 2016). Consequently, there is a greater need for firms to achieve and maintain competitiveness and even enhance it (e.g., Momaya 2001).

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Firm level competitiveness can be defined as the ability of a firm to design, produce and or market products, superior to those offered bythe competitors (D'Cruz,1992). Competitiveness is often viewed in terms of competency, where a firm's internal factors, such as, strategy and structure are believed to be the key to their competitive success (Doz and Prahalad, 1987; Hamel and Prahalad, 1989, 1990, Ambastha and Momaya, 2004, Haldar et al, 2016). Since a company is an artificial person, it cannot function on its own and its direction and control vests in the hands of its directors.Therefore, the governance structure, in general, and risk governance structure in particular, are expected to play a key role in effective and efficient risk management. Risk governance may be defined as 'the ways in which directors authorize, optimize, and monitor risk taking in an enterprise. It includes the skills, infrastructure (i.e., organization structure, controls and information systems), and culture deployed as directors exercise their oversight' (International Finance Corporation (IFC), 2012).

In view of the above, the responsibility of protecting the company from various risks, including, the risk related to competition (competitiveness)lies with the Board. Thus, afirm's competitiveness is intricately connected to its governance mechanisms in general and risk governance structure in particular.

This paper thus, attempts to examine the relationship between risk governance structure and competitiveness. It is believed to be a novel contribution to literature as none of the previous studies have attempted to bring together the elements of risk, governance and competitiveness. In theprocess, the study puts forth a first of its kind index- a risk governance index- as a measure of quality of governance structure. The usefulness and potential of the index can be gauged from the fact that the index was envisioned in 2013 when constitution of the risk management committee was not mandatory for Indian firms, but the index suggested it should be a mandatory provision to ensure effective and efficient risk management and subsequently SEBI made mandatory therisk management committee towards the latter half of 2014. Therefore, the index is not only the first of its kind but a forward looking proposition with implications for companies as well as policy-makers.

Further, the regression results provide evidence in support of the index as there has been found to be a significant and positive relation between the growth in market share of the firm and quality of governance structure. To ensure robustness of results, financial performance (as measured by ROA, ROE and firm's profitability) measures have also been taken as a proxy for firm's competitiveness; and yet there is a positive and significant relationship between competitiveness and quality of risk governance structure.

For better exposition, the paper has been divided into five sections. Section 1 gives a brief introduction of the subject followed by the literature review. Section 3 discusses the research design. Findings and analysis are presented in Section 4 and finally section 5 concludes the study by offering insights on the future research areas.

2. Literature Review and Hypothesis Development

Increasing volatility, uncertainty, complexity and ambiguity in business environment coupled with new regulations and government initiatives are making firms more vulnerable than ever before. These aspects are primarily manifested in terms of risk related to decline in market share or the ability of the firms to maintain their competitiveness.

It is pertinent to note that competitiveness, being a multi-dimensional concept, carries varying connotations. It could be viewed from three dimensions - country-level, industry-level or firm-level. Porter says 'it is the firms, not nations, which compete in markets' (Porter, 1998). Firm Level Competitiveness can be defined as the ability of firm to design, produce and or market

products superior to those offered by competitors, considering the price and non-price qualities (D'Cruz,1992).

From strategic and operational perspective the sources of competition could be categorised as Assets, Processes and Performance (Momaya,2001). The ability to sustain and increase the market share is a primary indicator of a firm's strategic intent, orientation of management and robustness of structures and processes that ensure effective and efficient utilisation of assets.

While the specific governance structures and characteristics vary among companies there is a universal consensus that well-governed companies are more capable of sound business judgement as good governance structures provide a framework for efficient, transparent, and accountable decision making. The genesis of this belief lies in the fact that the term 'Governance' is derived from the Latin word 'Gubernare' which means 'to steer usually applying to the steering of a ship' (Sharma, 2011). Thus, governance implies direction and control. Therefore, governance structures provide a way of reconciling divergent interests, planning for strategy and succession, accessing capital, cultivating the corporate image, and ensuring legal compliance. Corporate governance introduces internal controls that foster accountability and disclosure. Augmented with ethical codes of conduct and the leadership's tone from the top, proper corporate governance mechanisms are an important risk mitigation tool that can translate decisions into tangible benefits.

It is interesting to note that a number of studies have attempted to examine the relationship between firm's financial performance and corporate governance. Gompers, et al. (2003), constructed a governance index, Gompers, Ishii, Metric index (GIM index), using the provisions listed by Investor Responsibility Research Centre (IRRC) (comprising of anti-takeover measures focusing on external governance) for firms in corporate takeover defences. These provisions were classified into five categories: delay, voting, protection, State, other and consist of 24 corporate governance provisions. For every firm, one point was added for every provision that increased managerial power. A strong correlation was found between GIM index and stock returns.

Taking cue from the work of Gompers et.al (2003), Brown and Caylor (2006) came up with summary governance measured called Gov-score. It is based on 51 firm specific provisions, including both internal and external governance provisions. They argue that only a few corporate governance provisions have an impact on firm value. The argument is proved, as by using only 14per cent of the governance measures (as used in GIM index), Gov-score could fully drive the relation between Gov-score and Tobin's Q.

Following the work of Gompers et al. (2003) and Brown and Caylor (2006), Bebchuk et al. (2008) came up with a condensed measure of corporate governance called entrenchment index. It consists of six provisions: staggered boards, limits to shareholder bylaw amendments, poison pills, golden parachutes, and supermajority requirements for mergers and charter amendments. They find that increase in index significantly reduces firm valuation and abnormal negative returns. The remaining 18 provisions of IRRC (out of 24, as used in GIM index) are found to be insignificant. In other words, only 25per cent of the anti-takeover measures used to create GIM index, fully drives the relation between GIM index and Tobin's Using the above mentioned indices, many researchers have tried to examine the relationship between quality of corporate governance and firm value (as measured by equity prices especially).

In Indian context Balasubramniam et al. (2008) surveyed 370 Indian firms on issues like, board composition, board practices and process, Directors' background, compensation of executives and non- executives directors, shareholder rights, disclosure practices, etc. They corroborated their findings by establishing relation between governance and firm value. They concluded that large firms exhibit stronger relationship between governance index and market value of firm.

Raithatha and Bapat (2012) found that corporate governance score had no significant influence on different measures of financial performance. Sarkar et al. (2012) constructed a governance index for 500 largest Indian companies, by using data from 2003 to 2008. They used four dimensions to construct the index, namely, the board of directors, the ownership structure, the audit committee and the external auditor. The authors evidenced a rising trend in corporate governance index of Indian corporates. They concluded that Indian investors seem to reward better governed companies, as there is a strong association between market performance and corporate governance index.

Prasana (2013) observed that reforms in corporate governance and implementation of clause 49 by SEBI have made a significant impact on volatility of stock market in India. Haldar et al. (2013) reported that the pressure of majority independent directors on board have a positive impact on the return on equity. But board size has a negative correlation with ROE and EVA.

Das and Dey (2016) investigated the moderating role of corporate governance practices in large Indian corporations on firm performance, post introduction of Companies' Act 2013. They focussed on, board's diversity, CEO duality, board compensation, and promoters' involvement in company affairs.

Similarly, Arora and Sharma (2016) considered Indian manufacturing sector and found that relationship between corporate governance and performance is not very strong in India. They further state that larger boards have a negative impact on firm performance and board meetings are positively associated with ROA.

Though a number of studies have dealt with the relationship between financial performance and corporate governance, barely any of the studies have taken firm performance as a proxy for firm's competitiveness (Mittal and Zaidi, 2015).

Thus, it seems reasonable to say that literature on governance structure and competitiveness is still in its nascent stage. The few studies that deal explicitly with the topic primarily explore the relationship between governance and internationalcompetitiveness. Using a cross country sample, Ho (2005) attempted to examine the said relationship and evidence that better governance tends to improve firm's competitiveness. Similarly, in a study on Indian knowledge based industries, Haldar et al. (2016) found evidence that flexibility in corporate governance tends to boost firms' international competitiveness as measured by 'export jump'.

Though there are increasing attempts to view competitiveness in the light of governance mechanisms, the relationship between firm level competitiveness and governance structures, remains largely an unchartered territory.

Hypothesis development

As the company is an artificial person, the direction and supervision of the company as well as the responsibility to manage company's risk effectively and efficiently vests with the Board. The primary risk a company faces is the risk related to maintenance of market share or the ability to generate adequate returns for various stakeholders (financial performance). As evidenced by Sarkar et al. (2012), Haldar et al. (2012), Shivani et al. (2017), firms with better corporate governance tend to earn higher return on assets and equity. Therefore, it may be expected that firms with better risk governance structures tend to perform better (as measured by financial performance) and exhibit greater competitiveness (Momamya, 2001). Accordingly, the hypothesis is:

H_0: Firm's competitiveness is positively related with the quality of firm's risk governance structure.

3. Research Design

Objective

In light of the literature review, the major question that needs to be answered is 'do better risk governance structures lead to enhanced competitiveness'. Accordingly, the primary objective of the study is to explore the relationship between quality of firm's risk governance structure and its level of competitiveness. For the purpose, the study puts forth a first of its kind risk governance index- a measure of quality of risk governance structures.

Development of Risk Governance Index

To measure the quality of risk governance structure of firms, a normative risk governance index has been proposed.The index is based on an exhaustive list of governance variables which seem essential from the perspective of risk management. After a thorough literature review and consideration of legal provisions eleven variables could be identified as relevant variables to capture the quality of risk governance structures. These variables are:size of board(Lipton and Lorsch, 1992; Jensen, 1993; Yermack, 1996; Chen et al., 2007), board diversity in terms of gender (Blau, 1977; Eagly and Johnson, 1990; Deszo and Ross, 2012), proportion of executive directors(Financial stability board, 2012), executive/non-executive status of Chairperson(Higgs Report, 2003), proportion of independent directors(Dechow et al., 1996; Beasley, 1996; and Klein, 2002; Boyer and Stern, 2012), CEO duality(Rechner and Dalton, 1991), Chief risk officer (CRO)(Aabo and Simkins, 2005), risk management committee, mandatory committees, voluntary committeesand existence/non-existence of whistle blower policy(Rothschild and Miethe, 1999). These variables are scored on a scale of 1 to 5 with the exception of the variables, namely, status of Chairperson and CEO duality (which have been scored on a dichotomous scale with the score of 3 or 5) (Table 1a). Further, it is worth mentioning that in respect of some of the above-mentioned variables, there are certain legal/statutory requirements under the provisions of Companies Act 2013 and/or Clause 49 of Listing agreement (entered into with Securities and exchange Board of India (SEBI)). In the case where there is a legal/statutory requirement in respect of the above-mentioned variables and there is a non-compliance with such a requirement, a score of one has been envisaged. Though there is no legal requirement, for the larger part of study, especially in context of CRO, risk management committee and whistle blower policy, still a score of 1 has been assigned in the event of their non-existence. This view has been taken in the light of the fact that the study basically focuses on risk governance structure. Therefore, it does not matter whether the desired variable is mandatory or not. In other words, recognising the importance of these variables in the context of risk governance structure, their absence has been equated to non-compliance of a legal/statutory requirement.

In the context of voluntary committees, it is noteworthy that 33 committees were identified as existing in practice (based on perusal of 4,033 annual reports). A number of committees had different names but had the same function and role. Therefore, for the purpose of the study, the committees have been classified into five broad categories namely, shares related committees (includes committees like, share transfer , ESOP, etc.); finance related committees (includes, borrowing committee, financial management committee, etc.); human resource (HR) related committees (e.g.: screening committee, conflict resolution committee, etc.); management related committees (e.g. compliance committee, corporate management committee, etc.) and miscellaneous category (with committees like Information security committee, innovation committee, etc.). If a company has no voluntary committee, it will have a score of 1 and if a company has committees belonging to all 5 categories, it will be given a core of 5 (Table 1b).

Table 1a: Summary of Variables Used to Construct Risk Governance Index (RGI) and Scores Assigned to Them

Number of board of directors (Col. 1)	Board diversity in terms of gender (Col. 2)	Proportion of non-executive directors (Col. 3)	Executive/Non-executive chairman (Col. 4)	Proportion of independent directors on board (PoID) (Col. 5)		CEO duality (Col. 6)	Chief Risk Officer (CRO) (Col. 7)	Whistle blower policy (Col. 8)	Risk management committee (Col. 9)	Compulsory committees (CC) (Col. 10)	(Col. 11)
Number of board of directors (BOD)	*Proportion of female directors on board (PoF)*	*Proportion of non-executive directors on board (PoNED)*	*Status of Chairman*	*When the Chairman is an executive director*	*When the Chairman is a non-executive director*	*CEO duality*	*Appointed CRO*	*Implemented a whistle blower policy*	*Existence of a Risk management committee*	*Number of CC*	
											Assigned scores
0<No. of BOD <3	No female	0<PoNED<1/2		0<PoID<1/2	0<PoID<1/3		Yes	Yes	Yes	At least 1 CC is not in place	**1**
No. of BOD =3	0<PoF<1/3 OR PoF>1/2										**2**
No. of BOD>15		PoNED=1/2	Executive Chairman	PoID=1/2	PoID=1/3	Yes					**2.5** **3**
4≤No. of BOD<8 **OR** 10<No. of BOD≤15	1/3<PoF<1/2										**3.5** **4**
8≤No. of BOD≤10	PoF= 1/2	PoNED >1/2	Non-executive Chairman	PoID>1/2	PoID>1/3	No	No	No	No	All CC are in place	**5**

Table 1b: Scores in Context of Voluntary Committees

Constituted Voluntary committees	Score
None	1
Only in 1 category	1.8
In 2 categories	2.6
In 3 categories	3.4
In 4 categories	4.2
In all 5 categories	5

Therefore, based on the eleven variables, the minimum score a company can have is 15 and the maximum possible is 55 (the basis has been explained in the later part of this section). For ease of comprehension, the score obtained by each company has been expressed as a percentage of maximum possible score, i.e. 55. To illustrate, if a company scores 22, then the index will be presented as 40 per cent, i.e., (22/55)*100.

Measure of Competitiveness

Once the normative framework has been developed, an attempt has been made to gauge the relationship between quality of firm's *risk governance structure and firm's competitiveness*. Assets-Processes- Performance (APP) model (Momaya 2001; Ambastha and Momaya, 2004), advocates that market share could be a proxy for firm's competitiveness, but, as the *risk* surrounding the firm is the ability *to maintain* its market share, growth/decline in market share has been conceived to be the proxy of firm's competitiveness. Based on Herfindahl index, a popular measure of industry competitiveness and concentration (Lang & Stulz, 1992; Rhoades, 1993; Januszewski, Koke and Winter, 2002; Jimenez, Lopez & Saurina, 2007) the following measure of growth/ decline is being proposed as an indicator of competitiveness-

Growth in market share (g) = $\sqrt{\frac{Market\ share_{i,t+2}}{Market\ share_{i,t}}} - 1$ (Eq. 1)

Where,

a negative value implies decline and market share of a firm is as measured as $\frac{Sales_{i,t}}{\sum_{i=1}^{n} Sales_{i,t}}$.

For the purpose of computing the market share of a particular company, sales of all the firms (whether listed or unlisted) in that industry have been taken into account.

Control Variables

To control for the effect of other factors which also may affect the variables of interest in the study, a comprehensive set of other variables are included (Khanna and Palepu 2000; Chittoor et al. 2015) such as ûrm's age, firm size, leverage, growth rate, R&D intensity recession period dummy and industry dummy.

Age of firm- Age may influence the risk of firms as well as its competitiveness (Luo and Bhattacharya, 2009). It has been measured as the number of years a firm has been in existence (since its inception).

Size of firm- Sales, total assets, and market capitalization are the most commonlyused measuresof ûrm size. From an economic perspective, sales ûgures are less inûuenced by accounting manipulations or biases. It is also not affected due to relative capital or/and labour intensity of the ûrm (Hirschey 2008). Measurement problems linked to inûation, and replacement cost is almost negligible using sales as a proxy (Shalit and Sankar 1977). Hence, natural logarithm of sales has been used as a proxy ûrm size.

Growth rate of firm- Studies have suggested that growth rate/ growth opportunities available to a company may affect its performance. Similarly, Durnev and Kim (2003) show that growing companies, tend to exhibit higher returns to various stakeholders. Therefore, it is imperative to control for growth of company. It has been measured as year on year change in total assets.

R&D intensity- It is pertinent to control for the effect of firm's investment in various resources and capabilities, particularly technical investments that have a bearing on competitiveness. Therefore, R&D intensity has been measured by taking a ratio of ûrm's R&D expenses to its sales (Haldar et al., 2016).

Leverage- Traditionally, financing pattern of a company has been viewed as a significant determinant of firm performance. Pecking order theory suggests a negative relation between corporate profitability and debt ratios (Fama and French, 2002). Leverage has been measured as ratio of long term debt to equity shareholders' funds.

Recession dummy- The period of study is of particular importance as it includes the recession period, which impacted the world economy towards second half of 2008. As per the United Nations Council on Trade and Development (UNCTAD), investment brief (November 1, 2009), the year 2008 marked the end of a growth cycle in global foreign direct investment. Worldwide flows came down by more than 20 per cent. This global financial crisis reduced access to financial resources internally as well as externally (Singh et al., 2012). Thus, the study considers, two phases, Phase I (pre- recession period) April 1, 2005 to March 31, 2008 (2006-2008) and April 1, 2008 to March, 31, 2015 (2009-2015) as Phase II (post-recession period). A dummy variable has been used for the purpose.

Industry dummy- Different industries are expected to have experienced different regulations and barriers to entry and exit, leading to different competitive scenarios. Hence, it seems pertinent to control for industry-specific effects. For the purpose, sample has been divided into fifteen industry groups, namely, agriculture, capital goods, chemical, diversified, fast moving consumer goods (FMCG), healthcare, housing, information and communication technology (ICT), media, metal, miscellaneous, oil and gas, power, textile and transport (Singh et al., 2012).

Empirical Model

In view of the above, the following regression model has been proposed for the study:

$$Comp_{it}=\alpha+\beta_1 RGI_{it}+\beta_2 Age_{it}+\beta_3 Size_{it}+\beta_4 Growth_{it}+\beta_5 Leverage_{it}+\beta_6 R\&D\ intensity_{it}+\beta_7 Recession\ dummy_{it}+$$

$$Industry\ dummies_i+\varepsilon_{it} \qquad \text{(Eq.2)}$$

Where,

'$Comp_{it}$' is the measure of *i*th firm' competitiveness (as measured in Eq.1) in year *t*. Similarly, RGI is the risk governance index developed above and age, size, growth, leverage, R&D intensity, recession dummy and industry dummy are control variables, as defined in preceding sections.

The methodology applied to these variables is pooled data regression using Ordinary Least Square Method (OLS). Table 2 presents correlations among variables of interest. It can be seen from the table, that most of variables have a correlation of less than 0.5 with other variables. This finding is pertinent to avert the possibility of multi collinearly amongst variables. Also, Durbin Watson statistics in all the cases was close to 2, thus representing absence of autocorrelation. Further, to rule out the possibility of heteroscedasticity,the method of White's heteroscedasticity consistent errors and co-variance has been employed.

Table 2: Correlation Amongst Variables

Variables	R&D intensity	Leverage	Size	Growth	ROA	ROE	Profitability	Competitiveness	RGI	Age
R&D intensity	1									
Leverage	-0.10	1.00								
Size	-0.17	0.17	1.00							
Growth	0.10	0.00	-0.29	1.00						
ROA	-0.05	-0.33	-0.08	0.00	1.00					
ROE	-0.04	-0.20	0.07	0.06	0.57	1.00				
Profitability	0.06	-0.33	-0.06	0.08	0.24	0.33	1.00			
Competitiveness	-0.08	0.05	0.12	-0.23	0.03	0.02	-0.04	1.00		
RGI	0.01	-0.09	0.06	-0.10	-0.06	-0.01	0.00	0.02	1.00	
Age	-0.05	0.03	0.07	-0.05	-0.07	0.00	-0.04	-0.05	0.10	1.00

Sample

The sample consists of all 429 non-financial companies that constituted the NIFTY500 index on March 31, 2014. Only non-financial companies have been considered for the purpose of the study as financial companies are governed by a different set of regulations, are affected by

various other factors and their returns are not comparable to the returns of non-financialcompanies (Chittoor et al., 2015). Since, the paper introduces the RGI for the first time in literature, it seems pertinent to include a longer time-frame, capturing the entire business cycle; therefore, a 10 year period from April 2005- March 2015 has been considered for the purpose of the study. The data relating to governance variables has been primarily handpicked from companies' annual reports and the remaining data has been taken from Bloomberg database.

4. Findings and Analysis

Table 3 indicates that sample companies on an average had an RGI of 65.54% during the period of study. This is indicative of the importance (that at least some) Indian companies have been giving to risk governance structures. It is noteworthy that during the period of study the sample companies witnessed an average yearly growth in market share of about 2.3%. With an increase in GDP from 808 billion USD in 2005 to 2.1 trillion USDin2015, it wouldnot be unreasonable to state that Indian companies were in expansionary mode. Such expansion needs to be seen in the light of the fact that the sample companies are amongst the top 500 companies of the country in terms of market capitalisation. As a result, they are expected to be more competitive. Yet, the evidence of decline in market share of up to 62% is startling (Table 3).

Table 3: Descriptive Statistics

Variable	Mean	Maximum	Minimum	Std. Dev.
R&D intensity	1.252528	20.22	0.0007	2.480783
Leverage	1.375317	5.856193	0.062361	1.016631
Size	7.85391	13.01121	4.421127	1.496601
Growth	0.0234	2.348294	-1	0.425099
ROA	0.02109	0.101616	-0.17847	0.035928
ROE	0.008917	0.101743	-0.20796	0.060191
Profitability	0.090542	2.76433	-0.68283	0.132174
Competitiveness	0.0232	1.561797	-0.62344	0.194646
RGI	0.650702	0.852727	0.4	0.082518
Age	45.59158	152	4	24.03912

A further analysis (Table 4) reveals that it's the companies in the lowest RGI range (40-50%) that have actually suffered a decline in market share; in all other ranges there has been evidence of growth in market share. Interestingly, increasing RGI ranges correspond to increasing growth rates (in market share). These results clearly indicate that companies with better risk governance structures tend to be more adept and agile in dealing with risk related to maintenance of market share.

Table 4: A bird's eye view of RGI Range and Firm Competitiveness

RGI Range	Ave. growth/ (decline) in market share
40-50%	(2.63%)
50-60%	1.38%
60-70%	1.68%
70-80%	3.56%
80-90%	7.33%

In addition, the regression results (Table 5) reveal that there is a significantly positive relation between quality of risk governance structure and firm's competitiveness. In other words, firms with robust risk governance structures (in terms of normative framework) tend to be more competitive (as is seen in terms of their growing market share); with a 1% change in quality of RGI, the market share of firms (on an average) increases by 0.77%.

Further, in tune with the intuition, bigger firms seem to be more competitive as evidenced by positive relation between firm's size and competitiveness. In, contrast younger firms due to their lack of experience and operational difficulties seem to struggle to maintain their market share. Further, firms that are in expansionary mode as evidenced by growing market share tend to improve their market share as well.

Table 5: Regression Results

Variable	Coefficient
Intercept	(0.0598)
RGI	*0.0077***
AGE	*(0.0009)****
Growth	*0.0991****
Leverage	(0.0007)
Recession dummy	(0.0063)
R&D Intensity	(0.0028)
Size	*0.0127***
Industry effects	Yes
Number of observations	1621
Adjusted R-squared	6.83%
S.E. of regression	0.1768
Prob (F-statistic)	0.0000

***,**,* denote significance at 1%, 5% and 10% levels

In tune with the findings of Report for the World Economic Forum's MENA Regional Business Council (2016) the results clearly demonstrate that well-governed companies are more adept in handling a volatile economic environment and are more sustainable in the long term. They also highlight the need for strong governance structures in emerging markets in order to create an environment of trust for outside investors.

Robustness Checks and Additional Analysis

While the previous section used growth/decline in market share as a measure of competitiveness (not used in extant literature) because maintenance of market share is believed to be a prominent risk endangering the companies; to ensure robustness of results, it seems pertinent to examine the relationship between risk governance index and already established measures of competitiveness.

Therefore, to establish the validity of the index and to ensure the robustness of the findings, the widely used measures of competitiveness have been used in the regression models. For the purpose, the 'financial performance' facet as put forth in the Assets- Processes- Performance (APP) model of Momaya (2001), has been employed. Accordingly, the dependent variables, the measure of competitiveness, have been taken as return on assets (ROA) (profit before interest and tax divided by total assets)(Brick et al., 2006; Cheng, 2008; Jackling and Johl, 2009; Brown and Caylor, 2005), return on equity (ROE)(profit after tax and preference dividend divided by equity shareholders' funds) (Johnson and Greening, 1999; Zabria, et al., 2016) and firm's profitability (earnings after tax divided by net sales(Titman and Wessels, 1998; Singh et al., 2013). It is pertinent to note that ROA has been computed by subtracting the average ROA for the firm's industry from the firm's ROA; ROE has been computed on similar lines (Chittoor et al., 2015).

The regression models employed are:

$$ROA_{it}=\alpha+\beta_1 RGI_{it}+\beta_2 Age_{it}+\beta_3 Size_{it}+\beta_4 Growth_{it}+\beta_5 Leverage_{it}+\beta_6 R\&D\ intensity_{it}+\beta_7 Recession\ dummy_{it}+ Industry\ dummies_i+\varepsilon_{it} \quad \text{(Eq.3)}$$

$$ROE_{it}=\alpha+\beta_1 RGI_{it}+\beta_2 Age_{it}+\beta_3 Size_{it}+\beta_4 Growth_{it}+\beta_5 Leverage_{it}+\beta_6 R\&D\ intensity_{it}+\beta_7 Recession\ dummy_{it}+ Industry\ dummies_i+\varepsilon_{it} \quad \text{(Eq.4)}$$

$$Profitability_{it}=\alpha+\beta_1 RGI_{it}+\beta_2 Age_{it}+\beta_3 Size_{it}+\beta_4 Growth_{it}+\beta_5 Leverage_{it}+\beta_6 R\&D\ intensity_{it}+\beta_7 Recession\ dummy_{it}+ Industry\ dummies_i+\varepsilon_{it} \quad \text{(Eq.5)}$$

Table 6: Regression Results to Ensure Robustness

Variable	ROA	ROE	Profitability
Intercept	0.0239	0.0070	***0.2031******
RGI	*0.0422***	*0.0114***	*0.0253**
Age	***(0.0001)*****	(0.00002)	0.0001
Growth	0.0015	***0.0111*****	0.0230
Leverage	*(0.0182)****	*(0.0127)****	*(0.0480)****
Recession dummy	***(0.0192)*****	***(0.0146)*****	(0.0138)
R&D intensity	***(0.0025)*****	***(0.0018)****	0.0001
Size	0.0024	***0.0053*****	(0.0046)
Industry effects	Yes	Yes	Yes
Number of observations	1646	979	1647
Adjusted R-squared	21.82%	9.35%	21.40%
SE of regression	0.0572	0.0570	0.1162
Prob(F-statistic)	0.0000	0.0000	0.0000

***,**,* denote significance at 1%, 5% and 10% levels

It can be seen in Table 6 that there is a significant and positive relation between quality of governance structure and firm's financial performance as measured by ROA, ROE and profitability. These results provide evidence in support of the hypothesis that firms with better risk governance structures are skilled in managing their risks which is subsequently reflected in their financial performance.

It is noteworthy that there is mixed evidence in terms of relation of age, growth and firm size with competitiveness. But, leverage has been found to have negative impact on firm's competitiveness, across models. Similarly, firms' competitiveness seemed to have reduced significantly in the post-recession period. This could be attributed to the fact most of the companies are engaged in international trade and the global financial crisis is believed to have adversely affected the global business scenario, including the competitiveness of Indian companies.

5. Concluding Observations

Literature is rife with corporate governance studies and various versions of corporate governance indices are available. But, construction of a risk governance index (as proposed in this study) is perhaps the first of its kind attempt.

Indian companies have admirable risk governance structure with mean index scores of about 65 per cent. The general view is that a good risk governance structure is pertinent for effective and efficient risk management and better firm performance, and the results empirically substantiate the same. The finding of positive relationship between RGI and competitiveness, clearly indicates that firms with stronger risk governance structures are better at handling the risks arising from competitive pressures and in turn are able to generate better returns for their stakeholders.

Further, the study is believed to have important implications forinvestors as well as for management of companies. Admittedly, balanced Boards and effective risk management structures tend to enable companies limit agency problems, improve efficiency and enhance competitiveness and financial performance. Therefore, companies could/should strive to attain and maintain robust risk governance structures as proposed in the normative framework. Similarly, investors could evaluate companies on the basis of their RGI and gauge their sustainability and competitiveness.

Scope for Future Research

As the study is exploratory in nature, the study opens new avenues for future research. Future studies may examine the relation between international competitiveness and risk governance and other facets particularly those related to the process facet of the APP model (Momaya, 2001) as ultimately governance structures are envisaged to ensure that proper processes are in place. Further, governance structures could be examined in relation to the strategic and operational aspects of competitiveness, in terms of innovations and marketing, and reputation and brand,respectively.

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A Comparative Study of Select Ventures in E-waste Management: Exploring Scalability Related Problems

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Abstract

Electronic waste or E-waste is relatively a novel addition to the ever-growing hazardous waste stream. It includes discarded Electronic and Electrical Equipment (EEE). E-waste comprises of precious and hazardous materials which have a high impact on environment and to human health. The E-waste management has become a very critical issue in most parts of the world. This paper tries to compare the top technological venture related to E-waste, ERI (USA), with the rapidly rising Indian ventures namely Attero and E-Parisaara. The comparison is carried out based on background, technical capabilities, and the R&D prospects of the company. The secondary data is being used to draw the inferencesfor the ventures scalability. These comparisons are then being used to explore the areas where the ventures need to focus to deal with scalability and to overcome the barriers to venture competitiveness.

Keywords: Barriers to venture competitiveness, E-Waste management, Management of technology for flexibility, Techno Ventures from metro cities.

1. Introduction

Over the past 3 decades, especially in the 21st century, the amount and use of Electrical and Electronic Equipment (EEE) has increased exponentially.It can be partly attributed to rise in Information and Communication Technologies (ICT), the concomitant increase in versatility of most electronic devices and the downward trend in prices of the EEE. These reasons have attributed in reducing the lifespan of the EEE and thus converting them to Waste Electrical and Electronic Equipment (WEEE) or E-waste or End of life (EOL) equipment.

Electronics waste definition, categorization and compositions

E-waste term is used for electronic and electrical equipment, including all components, sub-assemblies, and consumables, deemed obsolete or unwanted by a user[1,2]. “Solving the E-waste Problem (StEP)” Initiative forecasts that the world will produce 33 percent more e-waste, or 72 million tons by 2017. As a leading producer, China produces about 12.2 million tons of e-waste, followed by the U.S. with about 11 million tons[4]. In 2015 India produced 15 million tons of E-waste and 90% of that was managed through informal recycling. Inescapably,

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the number of electrical appliances and communication technologies will continue to increase on a great scale, and usage of microprocessors and PCB's are increasing in daily objects. Today the Electronic market is one of the speedily expanding market. Fast -monetary growth, together with urbanization, decrease of cost of consumer products and a growing interest in consumer goods, has increased both the utilization and the manufacture of electrical and electronic equipment (EEE)[6].

The E-waste is categorized in 10 different categories as per the European WEEE directives 2002/96/EC and 2012/19/EU this categorization helps in recycling. This categorization is based on major household gadgets (Air conditioner, microwave oven, Refrigerator), minor household gadgets (DVD player, gaming console, television), IT and Communication equipment (mobile phones, modems, teleprinters), User gadgets (Radio, digital cameras), Illumination gadgets (LED, Halogens), Electrical and Electronic Equipment (wires, batteries, generators), Toys, Leisure and sports guide (batteries in cars, trains etc.), medical devices (medical thermometers, biomedical engineering instruments) and control instruments (microcontrollers relays etc.).

E-waste is constituting from a range of materials, from precious metals such as gold(Au), silver(Ag), copper(Cu) to plastics, glass and fibers. Generally, the constituents and compositions keep fluctuating according to the manufacturing product. A single electronic product could have 1000 different materials. These materials can fall under 'hazardous or 'non-hazardous' categories. Mainly E-waste comprises of about 50% ferrous metal, 21% plastics, 13% non-ferrous metal and the rest other constituents. Under non-ferrous metals, we have the precious metals (Au, Ag, Pt) and hazardous metals and compounds (Pb, As, Ce, Cr^{+6} etc.) There could be traces of radioactive metals as well.

E-waste in India

In 2016, a joint study by KPMG and The Associated Chambers of Commerce of India (ASSOCHAM), they reported India is the fifth largest E- waste producer. With 1 billion mobile phones in circulation, nearly 25% end up in waste annually. India has become world's second largest mobile market, after China, discarding roughly 1.85 million tons of electronic waste each year[3]. Figure 1 shows the top E-waste producing states in India. These states are responsible for more than 70% of E-waste in the country. Another recent study by Assocham-Frost & Sullivan shows that, the most E-waste are compounding from the urban cities to which Mumbai tops and followed by other major Indian cities. Table 1. Shows the amount of E-waste generated in the major metro cities of India. The percent composition of the waste can be seen by the pie chart in figure 1. Their study also shows that the E-waste is growing at a rate of 25%[5]. The rate of growth of E-waste in past 10 years and its future predictions is shown through figure 2[7].

Table 1: Amount of waste generated per annum in the major metro cities of India

Indian Cities	Amount of waste in 2016 (MT)
MUMBAI	120000
DELHI-NCR	98000
BANGLORE	92000
CHENNAI	67000
KOLKATA	55000
AHMEDABAD	36000
HYDERABAD	32000
PUNE	26000

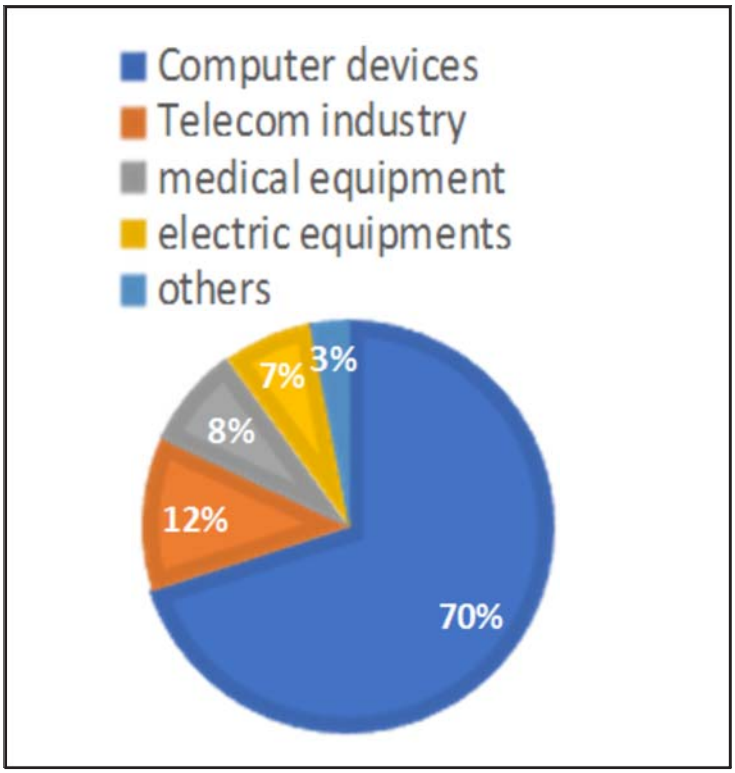


Figure 1: Percent representation of equipment's present in E-waste.

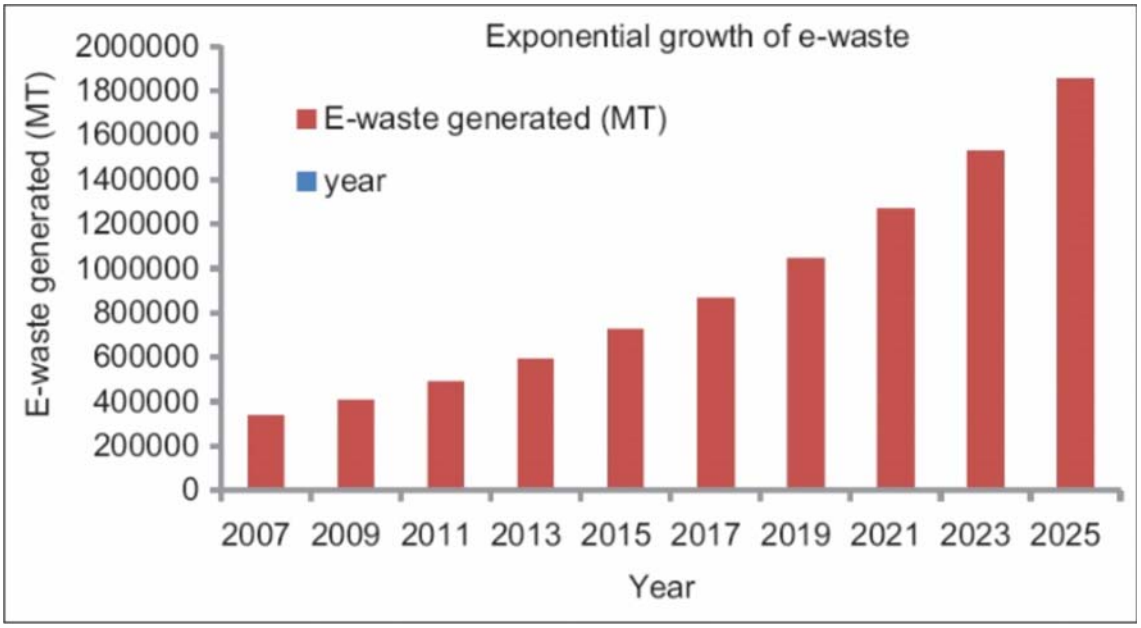


Figure 2: Exponential Growth of E-waste Over the 18 Years.



Figure 3: Top 10 major states of India responsible for more 70% of India's E-waste.

Health hazards due to informal recycling of E-waste

As the e-waste is combination of plastics, chemicals and metals improper handling of e-waste could be harmful to the environment and to humans. For the recycling of e-waste, India heavily depends on the unorganized sector or backyard recyclers as only a handful of an organized e-waste recycling facilities are available. Over 95% of the e-waste is treated and processed in most urban slums of the country, where untrained workers carry out the dangerous procedures without personal protective equipment, which are detrimental not only to their health but also to the environment[7]. Mainly in developing countries, the e-waste is dismantled manually and releasing the nondegradable plastics and persistent chemical to the environment thereby contaminating the quality of air, water and soil. The E-waste accounts for about 42% of the lead and 71% of heavy metals found in landfills. These pollutants lead to ground water and air pollution and soil acidification. High and prolonged exposure to these chemicals/ pollutants emitted during unsafe e-waste recycling leads to damage of nervous systems, blood systems, kidneys and brain development, respiratory disorders, skin disorders, bronchitis, lung cancer, heart, liver, and spleen damage[7].

Venture competitiveness and scale-up

Since India has often been very slow to diagnose and address such vexing problems such as E-Waste, technology-based and innovative ventures can play a catalytic role along with public bodies, firms and industries. Ventures have received major boost in India in last half a decade and numbers are growing rapidly. However, scalability of ventures is a major challenge (e.g. [32],[33]). Sometimes sustainability is also threatened, if relevant level of scale is not achieved. Hence, we also wish to focus on scalability dimension of ventures in our study.

2. Methodology

For exploratory phase of this study, we largely rely on analysis of secondary data. The study lays out the discussion based on the secondary data which was collected by the authors. The main discussion and the comparison were done on the inferences of these data. As the paper looks for the scalability of a venture in the current Indian scenario and a comparison with global successful companies (initially ventures). The authors chose the ventures based on their years of operation, achievements, milestones, awards and accolades earned till now and the growth of the company from initially a startup to a successful technological venture. Other aspects such as employee size, annual tons of recycling and location were also taken into consideration. As the Indian ventures had to be compared with a successful global venture, Electronics Recyclers International (ERI) was chosen for benchmarking. The Indian ventures which were eligible for our study were Attero Recycling and E-Parisaara. The data related to these companies and for our study were collected through the basic but detailed desk research and various interactive brainstorming among the authors. Experiences of authors of seeking efforts at E-Waste (very basic at IIT Bombay) and in advanced countries such as Japan and Singapore also helped. The following study is the foundation for the more depth studies in the determining the scalability for the upcoming technological ventures in E-waste industry.

3. Comparison between ERI, Attero Recycling and E-Parisaara

Background of the companies

Most of the E-waste recycling ventures came into existence only in 21st century. The comparison is carried out between the best of Indian ventures namely Attero Recycling and E-Parisaara and the global leader in E-waste recycling, Electronics Recyclers International (ERI). The table 2 gives an overview of the position of the top Indian ventures in compare to the global leader. Also, the scope for scalability to achieve the desired height for the Indian ventures. During the early years of Indian ventures, the main challenges they faced were to compete with their competitors mostly who were the informal recyclers, get the capital as during those days investment or funding were not as common as today, in India. The major challenge the Indian ventures had to counter was the development of the technology and to carry out the research work for providing green solutions in extraction of the reusable materials. The other common issues were the clearances of the possession for the land and approval from the state government and the environment and forest ministry for the setup of the plant. However, in developed countries these issues were not been faced by the international ventures.

Research and Development

Whether Indian technological venture or an international venture, to be successful and scalable, the venture must be very good at management of technology or innovation (MoT) and active in research and development. This can be proved by seeing the table 3, ERI invests around 10's of millions of USD in research of its technologies and thus has an advantage over all its peers and hence is a global leader in E-waste recycling. ERI have developed their own shredding, dust filtration and sorting equipment and have patents for these technologies. Other reasons that gives the ERI the advantage is the number of recycling plants and its presence in all the states of United states of America.

Indian ventures too understand the need to have the best technologies for better profits in future and for scaling up. Therefore, they are too investing in research and development and have developed some equipment's with better efficiency.

Table 2: A comparative table on the background of the ventures [13-31]

Name of venture (Country) -→	**Attero** (India)	**E-Parisaara** (India)	**ERI (**USA)
Criteria			
Year founded	2008	2005	2002
Founders	Nitin and Rohan Gupta	Dr P Parthasarathy	John Shegerian, EricRawn
Company size (employees)#1	250-300	180-200	600-800
Headquarters	Noida, Uttar Pradesh	Bangalore	Fresno, California
Recycle plant size	100,000 sq. feet	90,000 sq. feet	900,000 sq. feet
Plant location	Roorkee	Bangalore	Fresno, aurora, Colorado, auburn, flower mound, Plainfield, Badin, Holliston, saddle brook
No. of patents	7*	6 (patens applied)	4$
No. of cities	150*	100*	Whole united states
No. of recycling plants	1#	1#	8$
States	5*	5*	50
Clients	450+ (Samsung, amazon, Wipro, HCL*)	250+	2000+# (Samsung, HPAloca, Toshiba, LG, Panasonic)
Annual tons recycle	6,000	2,000	137,500+$
First round of funding	5 million USD	625,000 USD	No data available
Spent	2 million on land/building	325000 on land/ building	No data available
	2.5 million on machinery	250,000 on machinery	No data available
Fortune 500	No	No	Yes
CSR	No	Yes	Yes

Table 3: A comparison of the ventures in terms of Research and Development [13-31]

Name of venture (Country) -→	**Attero** (India)	**E-Parisaara** (India)	**ERI** (USA)
Criteria			
Exporting policy	Maybe	Yes, (Belgium, japan)	No
Technologically	Very good and competitive	Mediocre	World leader in terms of technology, highly efficient shredder
Technology environment friendly	Yes	Yes	Yes
Backed by	Un, world bank and other investors	E-waste agency, Karnataka state pollution Central board, EMPASwitzerland, GTZGermany	Us federal and local government, Aloca
In house R&D	Yes	Yes, but mostly out sourcing	Yes, highly focused
Research Funding	In thousands of USD	In millions of USD	In few thousands of USD

Technical Processes

The process of E-waste is the main core for any E-waste recycler as this is where the venture stands out in compare to other ventures in the market. The use of advance technology and efficient machinery will give the venture a benefit in operating and maintenance cost. The operation model is another important aspect for the venture, as the venture has plan to generate the revenue based on this model. Nowadays, the ventures are also taking extreme steps in collection and logistics of the E-waste from the consumer. Most of the E-waste ventures are providing complete transparency to the consumers in terms of recycling their product. They are assigning barcodes to the consumer products; this code is shared with the consumer to track the complete recycling and disposition of their product. They also assure the consumers of complete destruction of the data stored in the electronic devices through their data destruction and IT asset disposition technology. Attero was the first Indian venture to use these technologies in E-waste recycling.

Table 4: The comparison of ventures in terms of technical processes [13-31].

Name of venture (Country) -→	**Attero** (India)	**E-Parisaara** (India)	**ERI** (USA)
Criteria			
Operational model	Two bucket systems	One bucket system	Consumer used to pay
Shredding	Efficient	Mediocre	Very efficient (developed in house)
Glass cleaning system	Mediocre	Mediocre	Very efficient (developed in house)
Dust filtration system	Mediocre	Mediocre	Very efficient (developed in house)
Barcode tracking	Yes	No	Yes
Video verification and destruction	Maybe	No	Yes
Data destruction	Yes	Yes	Yes
It asset disposition	Yes	Yes	Yes
Direct pickup	Yes	Yes	Yes
Refurbishment	Yes	Yes	Yes

Certifications

The certifications listed shows the capability of the venture. ERI is the only venture which has been accredited by R2 and STEWARD certificate.

Table 5: The comparison in terms of certificates awarded to the ventures [13-31].

Name of venture (Country) -→	**Attero** (India)	**E-Parisaara** (India)	**ERI** (USA)
Criteria			
E-waste recycling authorization	Yes	Yes	Yes
STEWARD	No	No	Yes
R2	No	No	Yes
ISO 14001 - 2004	Yes	Yes	Yes
ISO 9001 - 2008	Yes	Yes	Yes
OHSAS 18001 - 2007	Yes	Yes	Yes

4. Discussion

To have environment friendly recycling of E-waste, skills and training of operationsis required. Expert personnel are prerequisite for recycling step as to screen the toxic and desirable substances from the complex e-waste and then different environment friendly recycling processes must adopted for toxic and desired substances separately. Also, to minimize the adverse environmental impacts on the recycling personnel, obsolete gadgets must provide by maintaining stringent environmental standards[8,9]. The focus of the paper is to determine the scalability for

Indian ventures and the challenges related to it in compare to global successful technological venture. The comparative table was drawn with the focus to check the possibility for scaling of the Indian ventures and for a depth of understanding of the challenges faced by the Indian ventures and the root cause for the vast gap between the Indian and global venture. The common challenges faced by the Indian ventures are competing with the backyard recyclers, governmental clearings, permissions and sanctions of projects, high capital demand for investment in R&D. The technological Indian ventures need to collaborate with the local municipal bodies for the more efficient collection of e-waste. For better logistical aspects the ventures can have branch collection points possibly in every major city and then the waste could be transported once the amount collected breaks even the operating, and transporting cost. With the current stage of ventures the technological support must be developed in the management of waste and in logistics. As, most of the ventures bleed a lot of revenue when mismanagement of waste happens. The Indian ventures have great scaling opportunities but a lot of reform in terms of laws and procurement of waste must be deal first.

5. Limitations and Further Areas of Research

As the study carried out basic desk research and just provides a glimpse over the scalability and challenges faced by the Indian ventures, a much more depth study is required on the ideas and the areas identified for scaling up. Intensive research as in interviews with the company officials, deep analysis of the company's financial condition and the actual management policies are missed. This paper is a starter for the future upcoming research work and for the other research groups as well. Here are just examples of high potential areas of further research.

- While concerns are being raised about failures of ventures, the holistic problem of 'low competitiveness of ventures in India' is less diagnosed systematically. Even a small step of problem structuring is likely to provide good learning.
- Low scalability of ventures in India has found to be a major problem. Research to identify drivers and enablers of 'venture competitiveness and scalability' is other fertile area of research.

6. Concluding remarks

E-waste is one of the rapid growing kind of waste. In the end of 20th century and in the beginning of 21st century it appeared in the developed countries. Nowadays, it has a been an important issue in most part of the world, including India. From past two decades a lot of new technologies have been developed to curb this issue. Apart from technological development, the government of India have also drafted a new set of rules for the recycling of e-waste.However, all these will be of limited help till concept of management of technology and innovation (MoT) that has relevance across levels-individuals, groups, ventures, firms, industries, states and country-is implemented with sincerity and flexibility. New technologies that we select and adapt should have significantly lower E-Waste or other waste and health problems. Concept of flexibility can provide better options to address such vexing problems and make ventures from India more competitive, scalable and sustainable.

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A Content "Analysis" of Leaders Communication: Special Reference to Public and Private Banks in India

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Abstract

When we talk of leadership and the effective communication of leaders, it is imperative for any organization. Leaders have manifold tasks in the organization as leadership is integrated with different levels like individual level, unit level and organizational levels. The purpose of this study is to examine, what is the effect of leadership communication in the organization. The purpose is also to find out to what extent the particular leadership behavior can impact the performance of public and private banks in India. The taken variables are based on the analysis of individuals, innovative role modeling recognition and monitoring and support for innovation.

In an endeavor to achieve the desired level of result and competence, the public sectors officials hunt for more effectual approaches of leadership, and challenge themselves to go for the prevailing models of the private sector organization. In the current study we have conducted qualitative analysis of CEO's messages to stakeholders through content analysis making use of DICTION software.

Keywords: Content analysis, diction, leadership, private bank, public bank.

1. Introduction

Work like hell..... Tell everyone everything you know..... Close a deal with a handshake..... Have fun! - Harold E. 'Doc' Edgerton.

Every organization today is working in the turbulence of uncertainty and competition. They are striving hard to sustain their presence, grow and become a leader. But in this realm of uncertainty and turbulence there are certain organizations which have shown their mark with better control on their functions and operations and turn their operations into their competitive advantage. The leader is the one who is accepted by the masses but the process to make him acceptable is an element of 'beyond Leadership'. It is how effectively they are communicating their ideas down the line..... In today's competitions the major responsibility of the organization is to achieve its economic development and also keep their employees motivated to sustain them in the organization.

When we talk of the PSUs, they constantly confront to the ever increasing demand in performance competence, their leadership techniques, to serve as per the expectations of the customers. As Budd, Thorp, and Donohew (1967) noted, the most important behavior of a leader is his or her form of behavior to communicate with others.

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Performance assessment in organization constantly confront to the ever increasing demand in performance competence, their effective leadership techniques, to serve as per the expectations of the customers (Moore, 2002). What is constantly challenging for them are; how to communicate effectively so that their ideas propagate as per the expectations of the leaders.

In response to the above said demands, recently many authors have addressed to the questions of effective leadership through effective communication in private and public sector organizations. Other endeavors were carried out by Horton, Farham, & Hondeghem (2002) who studied competency management in public sector organizations in the United Kingdom, Belgium, the Netherlands, Finland, France, Germany, Italy, Sweden and Poland. The Organization for Economic Cooperation and Development (OECD, 2001) has illustrated public sector challenges and approaches using leadership case studies from the United Kingdom, United States, Germany, Sweden, Norway, and Mexico. In the current study, we have tried to measure the leadership behavior in public and private banks of India. In this study we have employed qualitative analyses of the chairperson message to stakeholders published in the Annual Report through content analysis and have tried to capture how leadership behaviors through powerful communication are closely associated with success in public and private sector banks and the difference in the behaviors in public sector from those found in private sector banks

2. Rationale of the Study

Every bank has a different set of culture, work practices, environment, policies and the communication process. Therefore, it is obvious that different types of banks will have different styles of leadership communication. It is also been assumed that the public sector banks are more conventional in their viewpoint and so the leadership communication style will be more conformist and with more bureaucratic viewpoint. The managers in the banks follow tyrannical style of leadership and that is reflected through their communication style. Kaur (2004) established the acuity of employees towards transactional and transformational leadership behavior across public and private sector banks and also intended to conclude if such perceptions differ depending on the socio - demographic variables.

The Leaders who are concerned for the improvement in the relations with their employees, time and again weigh up the link between effective leadership and communication. Jack Welch often emphasized on importance of communication excellence and he tried to eliminate clutters and jargons from General Electric (GE), where he served as the Chairman and CEO from 1981 to 2001. Communication being easily understandable and understood was vital.

“Most management failures result from a failure to communicate somewhere along the line. Recognition of need to communicate ought to be written into the job specifications of every chief executive and senior manager. “Jacques Maisonrouge, former chairman, IBM World Trade Corporation, (https://www.mitre.org- Effective communication). In an article published by Bisk “Why is Communication Essential for Great Leadership?”; Educative Education University of Florida, the author cited an example of Michelle Peluso, CEO of Travelocity, Citigroup and Gilt, realized that only responsive leaders can motivate people. She was known to personally respond to every email of employees within 24 hours whether she is in the office or not. With this example we can understand the relationship between effective leadership through effective communication. By using effective communication, leaders can play a dominant role in bringing employees’ job satisfaction, productivity and commitment. An effective leader endows the way for the organization’s success and steer the followers towards achievement of the desired goals.

Carrie G. Connolly of Virginia Commonwealth University in her work “Communication Skills in Leadership” has given that” effective leaders need to stay focused on the vision and values of

the organization. Leaders who are able to build trust with followers and establish commitment with employees to the vision will see positive growth in the organization. Leaders who fail to use effective communication skills may see a disgruntled workforce and confusion about the direction of the organization. While leaders must embody several qualities and characteristics, effective communication skills is one of the most pertinent to building a successful organization."

When we take a deeper insight about an organization's success we find that it is dependent upon the leadership style and also the flow of communication properly down the line. CEO of Burberry Group, Angela Ahrendts, emphasizes on "very clearly, very consistently and very openly" with employees so that they can understand and embrace the company's expectations.

3. Structural Framework

Content analysis is a qualitative research technique used to identify individual differences among communicators (Weber, 1990). The tool uses speech to study human cognition and communication (Alvesson & Karreman, 2000). Political documents, corporate reports and scholarly treatises all use language to characterize a part of authenticity. It is a research technique for the objective, systematic and quantitative description of the manifest content of communication. Content analysis of texts offers much prospective profit.

There are several software packages for conducting content analysis. Most of the software makes use of word frequency counts (Morris, 1994). We have used DICTION for conducting computer-aided qualitative analysis. DICTION was developed by a communication researcher with more focuses on the subtle power of word choice and verbal tone (Hart, 1984b). DICTION is popularly used for the evaluation of various associations in the area of qualitative research (Short & Palmer, 2008). To find if the leadership behavior can be captured by studying the communication of the leaders in the organization, we carried out content analysis on the Chairperson message to stakeholders published in the Annual report of the banks. In the current study, content analysis of the Chairperson message how effectively they communicate to their stakeholders published in the Annual report of the banks was performed to validate the impact of communication on leadership behavior present in public and private banks. In our study, main purpose of measuring leadership behavior by making use of five "master" variables available in DICTION. In DICTION the master variables are like the constructs built on the vocabulary list. These master variables are defined under the titles of:-

Certainty

Optimism

Activity

Realism

Commonality

DICTION master variables were created with the rationale that "if only five issues could be raised of a given passage, these five would provide the most robust understanding (Hart, 2001).

These variables help an organization (bank) in examining the reflections of possible effects upon its performance. Within the scope of the study; Certainty, Optimism, Activity, Realism, Commonality were discussed in theoretical background section.

Table 1: DICTION Master Variables- Definition and Formula

VARIABLES	CERTAINITY	OPTIMISM	ACTIVITY	REALISM	COMMONALITY
DEFINITION	words demonstrating firmness, rigidity, and completeness and a propensity to articulate ex cathedra	Words supporting some people, group, thought or experience or highlighting their positive involvements	Words featuring association, transformation, the execution of thoughts and the evasion of inactivity.	Words featuring substantial, instantaneous, identifiable issues that influence people's daily lives.	Words depicting the consent standards of a group and declining personal style of involvement
FORMULA	[Firmness + Leveling + Cooperative + Perseverance] – [Numerical Terms + Uncertainity+ Self orientation + Diversity]	[Admire + Contentment + Encouragement] – [Culpability + Destitution + Defiance]	[Hostility + Achievement + Statement + Action] – [Cognitive Terms + Obedience + Adornment]	[acquaintance + Space Consciousness + Sequential Consciousness + Present distress + Human Interest + Compactness] – [Past Anxiety + Intricacy]	[Vitality + Collaboration + Bond] – [Range + Elimination + Emancipation]

4. Research Methodology

Objective and Hypotheses Practice open communication. Poor communication, including poor listening skills, is one of the most common and significant corporate leadership weaknesses. Without question, inadequate communication around critical success factors and a general lack of trust are two of the most common and significant leadership short-comings. Are you doing everything possible to provide understanding and context through clear and constant two-way communication and reinforcement of corporate goals and objectives, strategic direction, critical success factors, mission, vision, and values? Corporate wide business metrics should be continually circulated and discussed to provide an ongoing clear sense of what needs to be done. Are you really listening to employees and taking appropriate action? Misunderstood and misinterpreted corporate values and goals lead to poor performance and poor morale. The frequency and quality of employee-leader interactions should be reinforcing and encouraging. What leaders say, and how it is said, either encourage or discourage the productivity, effort, quality, and customer interactions of their employees/teams. It requires ample self-awareness on the leader's part to know how they are impacting and affecting employee behavior. Once that knowledge is gained, it should be channeled for maximum positive influence. While parameters must be established for formal communication and interaction, never forget that *all* of a leader's employee interactions and dialogues either reinforce or punish employee behaviors. You may even want to reinforce any common language or useful categories of speech, actions, and gestures that emerge in groups or throughout the organization in order to help employees and teams deal with conflict in cohesive and productive ways.

Develop and communicate values and norms that set the foundation of the organization's culture. Values, while not physically observable, underlie and determine behavior. Underlying assumptions and beliefs that are taken for granted (and that may over time even drop out of

awareness and be difficult to articulate) initially emanate from values and they form the deepest level of culture. Values and priorities are observed and felt through employee rewards and punishments, systems, and approaches and need to be consistent. Is there complete alignment between your organization's written and actual operating values? Your organizational values, its stated preferences for specific behaviors and outcomes, should not only address profit generation, but also should speak directly to the growth, development, and well-being of employees. Norms are the behaviors, approaches, and means of achieving goals that have been deemed to be culturally acceptable by others. A change in leadership certainly can bring about positive change in a company's culture - new leadership, reprioritization, redefined and clearer expectations, and often new strategies, all for the better. But, it's important for new leadership to understand that to the extent that old procedures, priorities, systems, and processes remain in place, they will continue to represent the past and have the "old influence" on employee behavior. Remember that when it comes to values, missions, and vision statements, how people/leaders act carries far more weight, and more directly affects your culture, than any written statements. What is leadership permitting, sanctioning, rewarding, applauding, praising, approving, and allowing continuing? What is leadership punishing, ignoring, terminating, and ending? All of these things should be in alignment with company stated values.

The objective of the research is to find if there is a difference in the communication style of chairperson of public and private banks as exhibited in their communication through Chairperson's speech published in Annual reports to stakeholders.

For our study we collected the secondary data from public sector bank and private sector bank but it did not include the co-operative bank or foreign private banks. The chairperson message of 25 public sector banks was available in their Annual report for the year 2016. For private sector bank, 59 messages of chairperson was available. So we used random sampling method to select 25 private sector banks from the list of 59 private sector banks. On each chairperson message we run content analysis, so as to measure the master (manifest) variables.

Following hypotheses are framed for data analysis:

H_{01} : There is no significant difference in the Activity aspect between private and public sector bank as exhibited by chairperson's message.

H_{02} : There is no significant difference in the Optimism aspect between private and public sector bank as exhibited by chairperson's message.

H_{03} : There is no significant difference in the Certainty aspect between private and public sector bank as exhibited by chairperson's message.

H_{04} : There is no significant difference in the Realism aspect between private and public sector bank as exhibited by chairperson's message.

H_{05} : There is no significant difference in the Commonality aspect between private and public sector bank as exhibited by chairperson's message.

To test the 5 manifest variables viz., Activity, Optimism, Certainty, Realism and Commonality for the two populations viz., Public and Private banks we used "independent sample-t test" to test the framed hypotheses. Also F test of sample variance is performed to find if the two populations have equal variance.

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Employers' Perception on the Predictors of Graduate Employability in Information Technology Sector

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Abstract

Purpose: *This research paper aims to analyze the perceptions of the employers in the Information Technology (IT) sector in India on the predictors of graduate employability. With the rising "employability gap" being witnessed by this sector, seeking and developing an employable workforce has been a challenge for majority of the recruiters. The significant factors that influence graduate employability in the IT sector have been identified through a conceptual review of literature. Further, this study aims to investigate the perceptions of one of the key stakeholder groups, i.e. employers, on these identified predictors of employability and empirically validate the relationship between the research constructs.*

Design / Methodology/ Approach: *The predictors of graduate employability in the IT sector have been identified through the qualitative analysis of the available literature. A preliminary validation of these predictors is conducted through Total Interpretive Structural Modeling (TISM), a qualitative modeling technique. Further, this study is empirical in nature that measures the perceptions of the employers on the identified predictors of employability through opinion surveys. Questionnaires are used to elicit responses from a sample of 236 respondents,i.e. technical / HR personnel at the middle level / upper middle level management positions spanning across 71 reputed IT companies in India. These respondents are activelyinvolved in the recruitment and selection of fresher graduates. The perception of the employers is analyzed using bivariate and multivariate analysis techniques.*

Findings: *The perception of the employers is captured on all the identified predictors of employability. These include the three macro variables and six micro variables of study (independent variables) that are deemed to influence employability (dependent variable). All these identified predictors are perceived significant by the employers, however, it is found that the level of significance for employability attached to these variables is different. At the macro level, technical skills and personal and interpersonal skills are found to be more significant for employability than organizational knowledge. At the micro level, technical specialties knowledge has a stronger influence on employability as compared to technology management skills. Furthermore, in context of the micro variables of personal and interpersonal skills, problem solving and critical thinking skills are considered most important. An analysis of the controlled impact of variables, i.e. when all the micro variables are taken together, highlighted the relatively greater importance attributed to technical specialties knowledge and also the insignificance of creative thinking skills for the employers.*

Originality / Values: *The questionnaire design and further empirical investigation conducted to analyze the perceptions of employers on the antecedents of employability is an original contribution and has not been published in any academic journal.*

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Research Implications and Limitations: *The findings of this study are expected to help the graduates seeking jobs in the IT and allied sectors and the higher education institutions offering academic programs in this domain. These findings would enable them to better understand the predictors of employability and focus on developing those factors that are deemed to be crucial and decisive by the recruiters.Opinion surveys have been used in this study to analyze the perceptions of the employers. There fore, there might exist a possible bias in the responses.*

Keywords: Employability, Employability gap, Employer demands, Information Technology sector,Skill deficit, Skill gap.

1. Introduction

The graduate recruitment scenario has witnessed fundamental shifts in the recent times wherein the term "employability" has gained a crucial significance. It can be conceptualized as the set of knowledge, skills and personal attributes that enhances an individual's ability to gain and maintain employment. The factors like globalization, technological changes and increased market competition have prompted the employers to hire "work ready" graduates who can transit from higher education institutions to the world of work efficiently and seamlessly. Hence, it has become imperative for these job seeking graduates to couple their academic degrees with vital skills and attributes that make them employable for the job market and meet the rising talent demands of the recruiters.

Though employability of graduates is rather crucial, however, India is facing rising skill gap, talent crunch and demand supply mismatch across many sectors of its economy. This gap is found to be more dominant in the Information Technology (IT) sector. The IT sector has made an unparalleled impact on the Indian economy. However, the sector is striving to deal with the challenges of employability gap and talent supply mismatch to maintain its global leadership position. It has been observed that the dynamic nature of the IT sector and the changing demands of the employers are further widening this gap. Therefore, it becomes imperative to understand the paradigm change in the perceptions of the recruiters in the IT sector. The National Association of Software and Service Companies (Nasscom, 2012) reports that employability is a crucial challenge being faced by India in general and the IT sector specifically. Nasscom (2014) reports that there exists an oversupply of talent and low employability in the IT sector in India. The research study indicates that that of the~0.6-0.64 million candidates willing to work in the non-business process management sectors (IT Services, Software Products and Engineering and R&D), around 0.15-0.18 million are deemed employable.

In context of this rising skill gap, perception and expectation gaps have been reported by various research studies. The differences in perceptions exist both in general and in the context of IT sector. Wickramasinghe and Perera (2010) compared the perceptions of graduates, university lecturers and employers in Sri Lanka on employability skills and found differences in the priorities given to the various employability skills by these stakeholders. Dupre and Williams (2011) identified a gap in the skills employers seek and students' perceptions of their abilities in those areas in US context. With a focus on IT/ IS sector, Lee et al (2002) found that there are significant perception gaps between IS academics and practitioners in terms of the required skills. Lowry and Turner (2003) also report gap in the perceptions and aspirations of IS graduates and employers. Trauth et al (1993) observed gap between the needs of the industry and the abilities of the graduates through the data collected from IS managers, IS consultants and IS professors. Highlighting these perception gaps, McMurtrey et al. (2008) indicated that understanding the skill set expected from IT personnel is an important endeavor for both companies and academic or training institutions alike. Because of the dynamic nature of this

sector, technology and the IT practices change at a fast pace, and in turn, this alters the skills required from IT professionals. As companies invest huge resources in training personnel, particularly the new IT employees, it is important for the educational institutions to understand the changing needs of the employers in order to plan an effective curriculum.

In view of the perceptual differences between the key stakeholder groups on the predictors of employability, it becomes imperative to measure the perceptions of these stakeholders and further understand the gaps between them. Such an analysis aims to reach the ground roots of "perceptions" in order to explore the employability gap that stems out of it and examine its nature and cause rather than scanning this issue at the surface or macro level. With this backdrop, this study aims to capture the perceptions of one of the key stakeholder groups i.e. employers, on the employability skills deemed significant for graduates in IT and allied areas. The conceptual model of research drawn from the conceptual review of literature has been empirically validated from the standpoint of employers and their perceptions on the predictors of employability have been captured and further analyzed.

2. Predictors of Graduate Employability in Information Technology Sector

A conceptual model of the predictors of employability in IT sector proposed by Sehgal and Nasim (2017) has been used to capture the perceptions of the employers on the factors that influence employability. This model isbased on the qualitative review of literature encompassing general employability studies, the well-grounded models of employability and the research studies specific to IT and allied sectors. The model depicts that the three macro variables (independent variables) i.e. Technical Skills, Organizational Knowledge and Personal and Interpersonal Skills are deemed to influence employability (dependent variable). These macro variables further consist of micro variables. The model as proposed by Sehgal and Nasim (2017) as shown in Figure 1 illustrates the possible linkage of the independent variables (predictors of employability) with the dependent variable-employability.

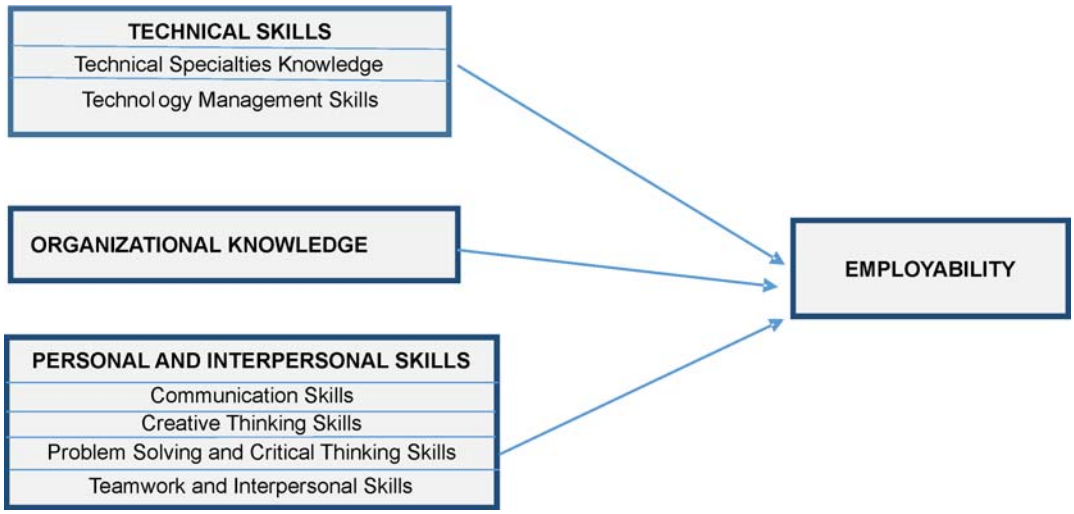


Figure 1: Conceptual model of research

Note: Adapted from "Predictors of graduate employability in Indian information technology sector" by Sehgal N. and Nasim, S., 2017, Int. J. Human Resources Development and Management, , Vol. 17, Nos. 3/4, pp.247–265. , Copyright 2017 by Inderscience

Table 1: Macro and Micro Variables of Research

Macro Variables	Micro Variables	References
Technical Skills	Technical Specialities Knowledge	Lee et al. (1995)
	Technology Management Skills	Nelson (1991), Trauth et al. (1993), Yen et al. (2001), Lee et al. (2002), Aasheim et al. (2009, 2012),
Organizational Knowledge		Nelson (1991), Yen et al. (2001), Bassellier and Benbasat (2004), Fang et al. (2005), Aasheim et al. (2009)
Personal and Interpersonal Skills	Problem Solving and Critical Thinking	Yen et al. (2001), Lee et al. (2002), McMurtrey et al. (2008), Tesch et al. (2008), and Wickramasinghe and Perera (2010)
	Communication Skills	Lee et al. (1995), Woratschek and Lenox (2002), Fang et al. (2005), McMurtrey et al. (2008), Tesch et al. (2008), Aasheim et al. (2009), ,Eom and Lim (2012)
	Creative Thinking	Yen et al. (2001), Lee et al. (2002), McMurtrey et al. (2008),Tesch et al. (2008), Wickramasinghe and Perera (2010), and Aasheim et al. (2012)
	Team Work and Interpersonal Skills	Teamwork skills: Woratschek and Lenox, (2002), Fang et al. (2005), Bailey and Mitchell (2006), McMurtrey et al. (2008),Tesch et al. (2008), Aasheim et al. (2009, 2012), and Interpresonal skills: Nelson (1991), Trauth et al. (1993) , Bassellier and Benbasat (2004), Aasheim et al. (2012), Rosenberg et al. (2012),
Employability		Hillage and Pollard (1998), Harvey (2001), Australian Chamber of Commerce and Industry and Business Council of Australia (2002), Fugate et al. (2004),Heijde and Van der Heijden (2006), Dacre Pool and Sewell (2007),Fugate and Kiniki (2008), Bridgstock (2009)

Further, the macro and micro variables in the research model are illustrated below:

Note: Adapted from "Predictors of graduate employability in Indian information technology sector'" by Sehgal N. and Nasim, S., 2017, Int. J. Human Resources Development and Management, , Vol. 17, Nos. 3/4, pp.247–265. , Copyright 2017 by Inderscience.

The conceptual model of research drawn from the literature was further subjected to preliminary validation using Total Interpretive Structural Modeling (Nasim, 2011; Sushil, 2012), a qualitative modeling technique. For this purpose, in depth interviews were conducted with domain experts in the IT sector to solicit their inputs on the subject and deriveastructural model of the predictors of employability. These include senior middle management professionals in reputed IT companies in India with expertise in the area of recruitment and selection of technical graduates.Eight elements were subjected to Total Interpretive Structural Modeling (TISM) including the dependent variable "employability" and the seven independent variables i.e. the two micro variables of "Technical Skills", the four micro variables of "Personal and Interpersonal Skills" and the variable "Organizational Knowledge" as it does not consist of further micro variables. Based on the opinion of the domain experts,these elements were hierarchically modelled into four levels.

Through this qualitative modeling technique, the research variables identified earlier through the conceptual review of literature were validated at the preliminary level.All the seven identified factors were endorsed by the industry experts as the drivers of employability. Further, some of the key factors affecting employability emerged to be technical specialties knowledge, technology management skills and communication skills.An innovation to the TISM by way of validating the developed model through the feedback from domain experts has been introduced to the TISM technique by Nasim (2011). The developed TISM model has been further validated through assessment surveys with a larger set of domain experts to enhance the credibility of the obtained results. The preliminary validation of the research variables through TISM sets forth the stage for further empirical validation.

3. Research Methodology

This study is empirical in nature that intends to capture the perceptions of employers on the predictors of graduate employability in the IT sector. Opinion surveys are used to collect data from recruiters in the IT sector in India. These surveys on one hand, measure the perceptions of the employers on the antecedents of the employability and on the other hand, empirically validate the relationship between the research constructs as proposed in the conceptual model of research from the standpoint of employers. Statistical Package for Social Sciences (SPSS) is used for the statistical analysis of the collected data. Hypothesis of association formulated for further investigation have been tested through correlation and regression analysis techniques.

4. Hypotheses Formulation

The hypotheses of association have been envisaged to capture the perceptions of employers. These have been formulated as below:

Hypotheses of Association for Macro Variables

Null Hypotheses: One macro independent variable is not a predictor of the dependent variable

Alternate Hypotheses: One macro independent variable is a predictor of the dependent variable

This is elaborated below:

HATE: Technical Skills are predictors of Employability

HAOE: Organizational Knowledge is predictors of Employability

HAPIE: Personal and Interpersonal Skills are predictors of Employability

The summary of the hypotheses for macro variables is presented in Table 2

Table 2: Summary of Hypotheses for Macro Variables

Independent Macro Variable	Associated with Variable	Hypotheses Code
Technical Skills	Employability	HATE
Organizational Knowledge	Employability	HAOE
Personal and Interpersonal Skills	Employability	HAPIE

Hypotheses of Association for Micro Variables

Null Hypotheses: One micro independent variable is not a predictor of the dependent variable

Alternate hypotheses: One micro independent variable is a predictor of the dependent variable

Based on the same, the alternate micro hypotheses with Technical Skills Factor may be formulated as follows:

HAT1E: Technical Specialties Knowledge (T1) is a predictor of Employability

HAT2E: Technology Management Skills (T2) is a predictor of Employability

The alternate micro hypotheses with Personal and Interpersonal Skills Factor may be formulated as follows:

HAPI1E: Problem Solving and Critical Thinking Skills (PI1) is a predictor of Employability

HAPI2E: Creative Thinking Skills (PI2) is a predictor of Employability

HAPI3E: Communication Skills (PI3) is a predictor of Employability

HAPI4E: Teamwork and Interpersonal Skills (PI4) is a predictor of Employability

The summary of hypotheses for micro variables is depicted in Table 3

Table 3: Summary of Hypotheses of Association for Micro Variables.

Independent Micro Variable	Associated with Dependent Variable	Hypotheses Code
Technical Specialties Knowledge	Employability	HAT1E
Technology Management Skills	Employability	HAT2E
Problem Solving and Critical Thinking Skills	Employability	HAPI1E
Creative Thinking Skills	Employability	HAPI2E
Communication Skills	Employability	HAPI3E
Teamwork and Interpersonal Skills	Employability	HAPI4E

5. Questionnaire Design and Pretesting

The questionnaire for the opinion survey of employers has been designed using the Likert scale to capture the perception of the respondents and test the hypotheses of association listed in the preceding section. The respondents were asked to indicate the level to which they agree or disagree with the listed statements in the questionnaire using a five point Likert scale. These statements recorded the perceptions of the respondents on the importance of various skills / knowledge areas that are deemed crucial for employability. To enhance the clarity of the designed questionnaire and avoid ambiguity, the questionnaire has been pre-tested using Questionnaire Appraisal System (QAS) developed by Research Triangle Institute. Cronbach Alpha has been used to measure the reliability. The value of Cronbach alpha is high (greater than 0.9) for all macro and micro variables indicating high reliability. Validity of the designed questionnaire has been tested through Exploratory Factor Analysis (EFA). Factor loading for all items was found to be greater than 0.6 and hence none of them was dropped. KMO index was found to

be greater than 0.5 for all macro variables and the significance value for Bartlett's test of sphericity is 0.000 for all macro variables. The values of univariate statistical analysis were all found within range and data was normally distributed.

6. Sample Design

The designed questionnaire was administered to the employers in IT sector that recruit graduates for technical jobs. The employers chosen for this study largely include NASSCOM member companies in Delhi / NCR region. Amongst the others, these include top IT companies that employ a vast majority of the workforce. Data was collected from HR personnel / technical staff at the middle level / upper middle level positions that are involved in the recruitment and selection of technical graduates. It is quite evident that the population for this group is very large and thus was assumed unknown. Response from a sample of 236 respondents from across 71 reputed IT companies has been elicited for this study. The chosen sample size is justified from the perspective of statistical techniques used in this study. The method adopted for sample selection has been a combination of judgmental, convenience and snowball sampling techniques.

7. Findings

The data collected through the opinion surveys has beenanalyzed using correlation and regression analysis techniques.The following sub sections discuss the results of the same.

8. Results of Correlation Analysis

Analyzing the relationship between the dependent and independent variables of study at the macro level, it can be noted from the results of correlation analysis depicted in Annexure Ithat the coefficient of correlation is greater than 0.7 for all macro variables. The strongest association is exhibited by Personal and Interpersonal Skills (.84) closely followed by technical skills (.83) and Organizational Knowledge (.78). Hence it can be concluded that all independent macro variables bear a strong positive correlation with the dependent variable of study i.e. employability.

With regard to the micro variables of Technical Skills, it can be noted that Technical Specialties Knowledge bears the strongest relationship with employability (.805) closely followed by Technology Management skills (.795). Also, in the category of Personal and Interpersonal Skills, Communication Skills (.735), Problem Solving and Critical Thinking Skills (.775) and Teamwork and Interpersonal Skills (.795) exhibit strong relationships with employability. Further, the multi collinearity test (Annexure III) indicates that VIF (Variance Inflation Factors) is well within the acceptable range (<10).

9. Results of Regression Analysis

The results of regression analysis have been discussed in the sub sections below.

Regression Analysis for Macro Variables

It can be noted from the results of regression analysis for macro variables (Annexure II) that the coefficient of determination, R square, for the independent macro variables is .755. This shows that 75.5% of the variation in employability can be accounted from the variability in the independent macro variables. The results indicate validation at 95 percent. The beta values of Personal and Interpersonal Skills (.354), Technical Skills (.349) and Organizational Knowledge (.210) are all found significant.

Regression Analysis of Micro Variables

The results of the regression analysis of the micro variables are discussed below.

Regression Analysis of Technical Skills

It can be noted from the regression analysis results for the micro variables of Technical Skills (Annexure II) that the coefficient of determination, R square was found to be .705. This shows that 70.5% variation in employability is accounted from the variability in Technical Specialties Knowledge and Technology Management Skills. The results indicate validation at 95 percent. The beta values for Technical Specialties Knowledge (.467) and Technology Management Skills (.414) are found significant.

Regression Analysis of Personal and Interpersonal Skills

It can be noted from the regression analysis results for the micro variables of Personal and Interpersonal Skills (Annexure II) that the coefficient of determination, R square is .712. This shows that 71.2% variation in employability is accounted from the variability in micro variables of Personal and Interpersonal Skills. The results indicate validation at 95 percent. Beta values for Teamwork and Interpersonal Skills (.259), Problem solving and Critical Thinking Skills (.281), Communication Skills (.228) and Creative Thinking Skills (.158) are found significant.

10. Regression Analysis ofControlled Impact of All Independent Micro Variables

Regression Analysis is undertaken with employability and the seven independent variables i.e. organizational knowledge, the two micro variables of technical skills and the four micro variables of personal and interpersonal skills (Annexure II). The R square for the variables together is .758. This indicates that 75.8% variation in employability is accounted from the variability of all the micro variables taken together. The results indicate validation at 95 percent. Except for creative thinking skills, the beta values of all the micro variables is fund to be significant.

11. Summary of Results for Hypotheses Testing

The results of correlation and regression analysis have been discussed in the preceding section. The subsections below summarize the obtained results.

Summary of Results of Hypotheses Testing for Macro Variables

It can be concluded from the preceding section that all the three macro independent variables i.e. Personal and Interpersonal Skills, Technical Skills and Organizational Knowledge are significant predictors of employability. On the basis of the same, the following table shows the results of testing the macro hypotheses of association.

Table 4: Results of Testing Macro Hypotheses from Employer Perspective

Independent Variable	R-Square	Beta Value	Significance	Hypotheses Code	Status of Alternate Hypotheses
Personal and Interpersonal Skills	.755	.354	.000	HAPIE	Accepted
Technical Skills		.349	.000	HATE	Accepted
Organizational Knowledge		.210	.001	HAOE	Accepted

Dependent Variable : Employability

12. Summary of Results of Hypotheses Testing for Micro Variables

The results of hypotheses testing for micro variables show that all the micro variables of Technical Skills and Personal and Interpersonal Skills tested separately are significant predictors of employability. Based on the same, the table below summarizes the results of testing micro hypotheses of association.

Table 5: Summary of Hypotheses Testing of Micro Variables from Employers' Perspective

Independent Macro Variable	Independent Micro Variable	R-Sqaure	Beta	Significance	Hypotheses Code	Status of Alternate Hypotheses
Technical Skills	Technical Specialties Knowledge	.705	.467	.000	HAT1E	Accepted
	Technology Management Skills		.414	.000	HAT2E	Accepted
Personal and Interpersonal Skills	Communication Skills	.758	.228	.001	HAPI3E	Accepted
	Problem Solving and Critical Thinking Skills		.281	.000	HAPI1E	Accepted
	Creative Thinking Skills		.158	.027	HAPI2E	Accepted
	Teamwork and Interpersonal Skills		.259	.000	HAPI4E	Accepted

Dependent Variable: Employability

The validated models of macro variables, micro variables of technical skills, micro variables of personal and interpersonal skills and controlled impact of all the micro variables are included in Annexure II.

13. Key Conclusions

- There exists a strong correlation between employability and its identified predictors (three macro variables and six micro micro variables of research)
- All the three macro variables and six micro variables are perceived significant by employers for employability. This implies that these factors are important predictors of graduate employability in IT sector from the perspective of employers.
- Although all the macro and micro variables of study are considered as important predictors of employability by the employers, however, the level of significance for employability attached to these variables is different.
- The employers perceive that the two macro variables i.e. Technical Skills and Personal and Interpersonal Skills are more significant for employability than Organizational Knowledge.
- At the micro level, the employers consider that Technical Specialties Knowledge has a stronger influence on employability as compared to Technology Management Skills.
- The employers perceive that each of the seven independent micro variables is significant for employability when considered separately, however, one of them i.e. Creative Thinking Skills was not found to be significant when all the micro variables were taken together.
- Analyzing the controlled impact of variables i.e. when all the micro variables are taken together, highlighted the relatively greater importance attributed to Technical Specialties Knowledge and also the insignificance of Creative Thinking Skills.

14. Directions for Future Research

The present study aims to understand the perception of employers on the predictors of graduate employability. Further, in order to assess the perception gaps between the key stakeholders, a similar study can be conducted to capture the perceptions of the other stakeholder group i.e. graduates (potential job seekers), in the IT sector. Subsequently, the obtained results can be used to examine the perceptual differences between them on the identified predictors of employability. This can be achieved using multivariate statistical analysis techniques like correlation and regression analysis and one- way ANOVA. Such an analysis would enable to investigate the employability gap that stems out of the differences in perceptions. Theseperception differences can furthercontribute to augmenting the employability gap in the sector. Based on subsequent analysis, recommendations can be proposed to plug in the perceptual differences that would abbreviate the existent employability gap.

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Measuring the Relationship between Job Resources and Employee Engagement: A Study of Generation Y Employees

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Abstract

Job resources refer to those physical, psychological, social, or organizational aspects of the job that are either/or: Functional in achieving work goals, Reduce job demands and the associated physiological and psychological costs, Stimulate personal growth, learning, and development. In literature there is a long list of job resources available primarily at three levels such as task, interpersonal & organizational. Some of the key resources are social support, performance feedback, and autonomy. As per SET (social exchange theory) when individuals receive economic and socio emotional resources from their organization, they feel obliged to respond in kind and repay the organization. The present paper is based on the same premise in which firstly some of the job resources are recognized from literature review whose perceptual availability is measured from Generation Y employees working in Indian technology firms. Secondly job resources led engagement is measured to ascertain their worth in keeping the Gen Y employees committed and involved. The tools utilized is regression analysis and the software used is SPSS.

Keywords: Job resources, engagement, Gen Y, Social Exchange

Introduction

There is a constant endeavor from organizations to effectively engage and retain their 21st century workforce. The workforce of today is known by a generation called Millennials whose birth year ranges from 1980 to 2000. India as a country being second populated country host a quarter of this new generation, largest in the world. The working proportion of this generation work in different sector and industry in India and one of the sector ie. IT sector which is the focus sector in this paper caters to 60-70 percent of this professional workforce. Organizations has certain things to offer for ex. Meaningful job characteristics, social support, innovative HRD practices to their employees to keep them motivated and engaged in their work. Such things or offerings may be called as job resources which are available at different levels of organization depending upon the size and nature of the organization. It is believed that job resources fosters employee engagement which leads to positive organizational outcomes. The rationale of the paper is determine which among the taken job resources has the potential to engage generation Y employees that could result in fall of their turnover intentions.

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Literature Review

In 1990 Kahn (1990, p. 694) introduced the concept of employee engagement, giving his now famous definition quoted in the introduction, namely, "the harnessing of organization members' selves to their work roles; in engagement, people employ and express themselves physically, cognitively, and emotionally during role performances". Kahn added that three psychological engagement conditions are necessary for an employee to be rightly engaged: meaningfulness (work elements), safety (social elements, including management style, process, and organisational norms) and availability (individual distractions).

Schaufeli and Bakker (2010) define work engagement as "the psychological state that accompanies the behavioural investment of personal energy" (p. 22). It depict that an engaged employee is intellectually and emotionally bound with the organisation, feels passionately about its goals and is committed to live by its values.

According to Gallup (2002) there are three types of people: engaged employees, not engaged employees, and actively disengaged employees. Engaged employees are builders who consistently strive to give excellence within their roles. Not engaged employees focus on the tasks spelled out to them rather than the goals of the organisation. They do what they are told to do. Actively disengaged employees are dangerous individuals who not only do not perform well but also demotivate the performer in the organisation.

Academicians became interested in the concept to a large extent only from 2006 (Welch, 2011) when a number of studies extended the concept of employee engagement to job engagement, work engagement, and organisation engagement. Saks (2006) used Khan's (1990) definition and developed the construct including job and organisation engagement. According to Saks the antecedents of employee engagement were job characteristics, perceived organisational support, perceived supervisor support, rewards and recognition, procedural justice and distributive justice. On the other hand, the consequences of engagement were job satisfaction, organizational commitment, intention to quit and organisational citizenship behaviour. Numerous studies suggest that the presence of higher levels of employee engagement significantly reduces turnover intention (Maslach et al., 2001; Saks, 2006).

Six management functions (job resources) emerged in order of importance as critical determinants of executive's engagement according to Joshi and Sodhi (2011), namely, job content (autonomy, challenging opportunities for learning), compensation/monetary benefits (attractive salary vis-a'-vis qualifications and responsibility, adequate compensation for the work and intra-organisation parity), Supervisor support (approachability of top management, their values and ethical conduct, equality in treatment, respecting the views of subordinates, providing an environment of working together), coworker support, scope for advancement and career growth (well-designed policy, adequate opportunities for career growth and advancement, clearly laid down career growth paths; implementation of the promotion policy in a fair and transparent manner, help to the employees in achieving growth) and team orientation/team work (importance, cooperation in inter- and intra-department teams).

The present study focuses in detail on the following determinants of employee engagement so as to model it comprehensively.

Job Characteristics

Jobs that are high on the core job characteristics provide individuals with the room and incentive to bring more of themselves into their work or to be more engaged (Kahn, 1992). May et al. (2004) found that job enrichment was positively related to meaningfulness and meaningfulness

mediated the relationship between job enrichment and engagement. This is based on Hackman and Oldham's (1980) job characteristics model and in particular, the five core job characteristics (i.e. skill variety, task identity, task significance, autonomy, and feedback).

The identified five core job characteristics are:

- Skill variety: This refers to application of different skills, abilities and range of knowledge by the employees to perform tasks in a job (Hackman & Oldham, 1980).
- Task identity: Task identity is "the degree to which a job requires completion of a "whole" and identifiable piece of work: doing a job from beginning to end with a visible outcome" (Lunenburg, 2011, p. 2).
- Task significance: It refers to the impact one's job can put on others life i.e. how important is the task. Tasks can be significant for the immediate organization known as its internal significance and can also be important for one's relatives, friends, and neighbours known as its external significance.
- Autonomy: It refers to the degree of freedom extended to employees to take decisions on what goal to achieve and how to achieve (Molleman, 2000). Task autonomy is studied at individual level as it could bring changes to psychological phenomena like attitudes and behaviour (Langfred&Moye, 2004).
- Feedback: It is the information passed to the employees related to their job performance. It is ideally given by supervisors but can also be fetched from various other sources as well.

Extrinsic Rewards

Compensation or remuneration is an indispensable attribute to employee engagement that motivates an employee to achieve more and hence focus more on work and personal development. It involves both financial and non-financial rewards.

Armstrong (2002, p. 62) stated that "financial incentives and rewards can motivate. People need money and therefore want money. It can motivate but it is not the only motivator. It has been suggested by Wallace &Szilagyi (1982) that money can serve the following reward functions.

- It can act as a goal that people generally strive for although to different degrees.
- It can act as an instrument that provides valued outcomes.
- It can be a symbol that indicates the recipient's value to the organization.
- It can act as a general reinforce because it is associated with valued rewards so often that it takes reward value itself".

Non - monetary extrinsic rewards also play a pivotal role in motivating employees to achieve work goals. They also play a crucial role in employee retention. Non - monetary benefits are available in form of organization safeguarding workforce diversity, working towards inclusion, adopting work-life balance and extending opportunities for career growth.

A study by Saks (2006) revealed that recognition and rewards are significant antecedents of employee engagement. They noticed that when employees receive rewards and recognition from their organisation, they will feel obliged to respond with higher levels of engagement. Kahn (1990) observes that employee's level of engagement is a function of their perceptions of the benefits they receive. Therefore irrespective of the quantity or type of reward, it is the employee's perception of the same that determines his/her content and thereby one's engagement in the job.

Supervisor Support

An important aspect of safety stems from the amount of care and support employees' perceive to be provided by their organization as well as their direct supervisor. In fact, Kahn (1990) found that supportive and trusting interpersonal relationships as well as supportive management promoted psychological safety.

Major work under social support is done by House (1981) where support is classified according to sources (colleagues or supervisor) and support types, (instrumental, emotional, informational, and appraisal support) (House, 1981). Research also clarifies that the types of support are unique and mutually exclusive and doesn't seem like to overlap each other (Barling, MacEwen& Pratt., 1988; Himle & Jayaratne, 1991). General supervisor support focuses on support for personal effectiveness at work. Supervisor support comes in form of understanding employee's needs and wants, giving them genuine responses and confidence to raise their problems and help in resolving work related issues (Deci & Ryan, 1985). When it comes to measuring the effects of supervisor support, it is found that their support can lead to many positive outcomes like employees may become more committed and with reduced burnout, they show less intentions to quit (Kalliah & Beck, 2001). Similarly Munn, Barber & Fritz (1996) and Hatton & Emerson (1998) found that supervisor support leads to job satisfaction and reduced intention to quit. PSS is likely to be an important predictor of employee engagement. In fact, a lack of support from supervisors has been found to be an especially important factor linked to burnout (Maslach et al., 2001).

HRD

Training and career development is another important dimension which is to be considered in the process of engaging employees since it helps the employees to concentrate on a focused work dimension. Training improves service accuracy and thereby impacts service performance and employee engagement (Paradise, 2008). Alderfer (1972) even suggested that when an organisation offers employees a chance to grow, it is equivalent to rewarding people.Scholars such as Shuck et al (2010) and Schaufeli & Salanova (2010) held that learning opportunities positively affect the development of employee engagement. Individual employees feel the need to keep updating their knowledge, skills, and abilities to remain employable in the competitive labor market (Salanova, Schaufeli, Xanthopoulou, & Bakker, 2010). Therefore it seems that engaging employees is not an onerous task provided they are offered opportunities to develop themselves on a continuous basis (Schaufeli&Salanova, 2010). It is also examined that involvement of employees in task can be attained by offering them learning opportunities designed for their upliftment (Shuck & Rocco, 2014).

Objectives of the study

To measure the availability of resources in the jobs perceived by generation Y employees.

To examine the relationship between job resources and engagement of generation Y employees.

Hypotheses of the study

Job Characteristics is positively related to Job Engagement

Rewards and Recognition is positively related to Job Engagement

Perceived Supervisor Support (PSS) is positively related to Job Engagement

HRD practices is positively related to Job Engagement.

Method

Participants and Procedure

Participants included 164 employees working in a variety of jobs in Indian IT organizations. The profile of participants is that most of them are in their late 20s or early 30s because the study has targeted Gen Y working professionals. The criteria adopted to select respondents rests upon their birth years which 1980 -2000 is considered. Standardized questionnaire was utilized to collect the primary data and responses were elicited using both online and offline mode. Mode of sampling was convenience. Demographic information was also collected which primarily include data on gender, highest educational qualification, designation, stream and other related information. Participants indicated their response on a five-point Likert-type scale with anchors (1) strongly disagree to (5) strongly agree. Variables taken for the study consists of *job characteristics, rewards, perceived supervisor support, HRD practices and engagement.* Out of the selected variables first four are independent variables and last is dependent variable. Purpose is measure the effect of all IVs on engagement and to measure the effect of different aspects of job on engagement, regression analysis is conducted to ascertain the value of r and r^2 and the value of p to accept or reject the hypotheses.

Results

First of all descriptive analysis of the data is performed which is shown in Table 1. Secondly In order to test the hypotheses for the antecedents of employee engagement, multiple regression analyses were conducted in which the measure of engagement was regressed simultaneously on all four of the antecedent variables. As shown in Table 2, 3 & 4, the results indicate that the antecedent variables explained a significant amount of the variance in job engagement (R^2= 0.59, $p < 0.001$). With respect to the study hypotheses, both supervisor support (0.27, $p < 0.001$) and HRD practices (0.61, $p < 0.01$) were significant predictors of job engagement. These results provide support for H3 and H4.

Table 1: Descriptive Analysis

	N	Mean	Std. Deviation
Joball	164	3.7793	.72047
extrinsicall	164	3.9167	.65389
Supvall	164	3.7134	.76041
HRDall	164	3.8136	.69471
ENGall	164	3.8092	.59510
Valid N (listwise)	164		

Table 2: Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.771[a]	.594	.584	.38372

a. Predictors: (Constant), HRDall, joball, Supvall, extrinsicall

b. Dependent Variable: ENGall

Table 3: Anova Results

Model 1	Sum of Squares	df	Mean Square	F	Sig.
Regression	34.314	4	8.579	58.263	.000[b]
Residual	23.411	159	.147		
Total	57.726	163			

a. Dependent Variable: ENGall

b. Predictors: (Constant), HRDall, joball, Supvall, extrinsicall

Table 4: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.395	.218		6.386	.000
	joball	-.086	.045	-.104	-1.914	.057
	extrinsicall	-.016	.063	-.018	-.263	.793
	Supvall	.211	.054	.270	3.930	.000
	HRDall	.529	.062	.618	8.582	.000

a. Dependent Variable: ENGall

Conclusion

Results show that variables such as supervisor support and innovative HRD practices are more effective to woo the young workforce. Factors like job characteristics and extrinsic rewards despite being available to the youth are not able to engage the workforce. With the results, one can also interpret the motivations of this generation of employees. Generation Y in this study has shown more strong relationship of supervisor support and HRD practices to their engagement. It means that this workforce while on job require a conducive and supportive leadership that is readily available and is there to listen to their queries whilst boosting their confidence. The next big thing is the innovative HRD practices that is stealing the limelight with a high engagement potential among the Generation Y employees. Many organizations are coming with out of the box practices like reverse mentoring, sharing the leaves among the employees, child care & maternity leaves and more. In the present study also HRD practices finds a significant portion of engaging them. Organization should also keep on doing a resource audit in order to find out what things or what offerings are getting redundant andalso acknowledge the needs of the emerging workforce in order to keep the balance going whilst keeping the organization running successfully.

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Talent Management : A Critical Imperative for Organizational Excellence

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Abstract

This research paper examines the applicability of talent measure sculpt for effective talent management in automobile industries and IT sector with specialreference to Noida District in Uttar Pradesh, India. In the primary data collected from the 100 respondents from automobiles industry and IT services sector using factor analysis, seven important factors: (1) creativity and innovation; (2) leadership; (3) teamwork; (4) interpersonal sensitivity; (5) personal motivation; (6) association; and (7) team spirit, which constitute talent were found. It was also found applying nonparametric Mann-Whitney test that there is no significant difference between the opinion of automobile industry and IT service sector employees with regard to a set of factors that constitutes talent management. This study helps the company to retain the present talented workforce and stop them from quitting the organization. Critical talent has been defined and identified covering all staff-level positions and suggestions have been proposed in line with company's requirements and capabilities in order to select perfect and highly skilled employees for the organization.

1. Introduction

Talent management implies recognizing a person's inherent skills, traits and personality, and offering him a matching job. Every person has a unique talent that suits a particular job profile and any other position may cause discomfort. It is the job of the management, particularly the Human Resource (HR) department, to place candidates with prudence and caution. A wrong fit will result in further hiring, re-training and other wasteful activities. It is a systematic approach to managing talent in an organization. The important dimensions which constitute the concept of talent management are attraction, retention, motivation and engagement, development, and succession planning. But they are bundled together to produce a more coherent whole that can be a vehicle for the development and implementation of coordinated and mutually supporting activities that help the organization to get and keep the talented people it needs.

Talent management is the most satisfying and productive aspect of HR management. Finding good people is only a part of the task; talented people can be difficult to manage, but the effort towards nurturing talent is well worthwhile. Hence a serious concern of every HR manager in order to survive this 'war for talent', is to fight against a limited and diminishing pool of qualified available candidates to replace valuable employees when they leave, dramatically underscoring the difficulty in attracting, motivating and retaining the best employees in the industry. Technology has become increasingly dependent on knowledge workers who provide the intellectual capital to develop new products and execute effective marketing strategies. This

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has led cutting-edge companies to realize that acquiring, cultivating and leveraging their talent base is where their real competitive edge lies.

2. Talent Management: A Preview

The process of attracting and retaining profitable employees, as it is increasingly becoming a strategic import for competing firms, has come to be known as 'the war the talent'.

This study focuses on retaining present talented workforce and stopping them from quitting the organization. Critical talent has been defined and identified at automobile industries and IT sector covering all staff level positions (executives). This survey has been conducted to check the talent gaps and identify the issues and challenges affecting the talent pool. Suggestions have been made in line with the company's requirements and capabilities, and to select the perfect and highly skilled employees for the organization, highly demanding business environment makes it imperative for the organizations to build competence in the form of superior intellectual capital. It is agreed by almost all CEOs of big companies that talent management is an important aspect of HR. It is the duty of the HR to nurture a brigade of talented workforce, which can win them the war in the business field. The talent has to be spotted, carefully nurtured and most importantly preserved.

In this more democratic vision, every employee has the right-and the responsibility – to develop their abilities. 'Talent Management' means different things to different organizations. To some, it is about the management of high-worth individuals or 'the talented', whilst to others, it is about how talent is managed generally, i.e., on the assumption that all people have talent which should be identified and liberated.

From talent management standpoint, employee evaluations concern two major areas-performance and potential. Current employee performance within a specific job has always been a standard evaluation measurement tool of the profitability of an employee. However, talent management also seeks to focus on an employee's potential, implying an employee's future performance, if given the proper development of skills and increased responsibility.

In order to effectively retain and develop talent, one needs to understand what the individuals are looking for in a future career and in an organization. It includes work ethics and values, career planning, work environment and culture, benefits and reward systems, and ways of motivation.

In the present highly competitive world, where change is the only constant factor, it is important for the organization to develop the most important resource of all, i.e., the human resource. Talent management helps organizations to make the most of the strengths and talents of their employees. Talent management has a number of benefits to offer such as employee engagement, retention, aligning to strategic goals in order to identify the future leadership of the organization, increased productivity, culture of excellence and much more.

Many companies today do not have a 'talent strategy' in place, despite organizations' acknowledging the fact that talent is an importance issue. In many organizations there is a lack of workforce planning, while the approach to accessing talent is poorly coordinated across the business. It is crucial that talent management system be put in place for building organizations.

2. Review of Talent Management

Critical 'talent' represents the highly developed skills and deep knowledge possessed by individuals, of not just the work itself, but of how to make things happen within a company.

Enough research has been done by firms to retain their top people. Research suggests that a company's 'stars' are the first ones to be poached by competitors and thus are less likely to stay.

Integral Talent Systems Inc., in 1997, suggested that the companies must continuously focus on their critical talent to ensure that their skills, interests, and capabilities evolve in line with strategic objectives, and listed out various retention practices.

A report in *The Hindu* in 2010 examined the dimensions of talent management and the challenges that organizations face with regard to employee retention in an increasingly competitive labor market. The objectives were to benchmark retention rates, costs and outcomes, identify the reasons why employees leave, determine which practices are most effective for improving retention, and understand how retention affects organizational outcomes.

A study by Aberdeen Group, in 2015, found that 85% of HR executives reported that the single greatest challenge in workforce management is creating or maintaining their companies' ability to compete for top talent.

Kumar (2007) showed that talent is a critical driver corporate performance and potential competitive advantage. Yan and Dauglas (2009) found that the concept of job-embeddedness to research on international assignments helps to explain how the processes of expatriation and repatriation might lead to such outcomes as talented person-organization fit or career exploration.

John et al. (2009) expressed that retaining top talent is a primary concern for many organizations. Dana (2009) opined that employees who read Talent on Demand (ToD) will realize that they need to develop the talents and skills that are most in demand, and keep themselves updated to ensure that they are always valued.

Aravamudhan (2010) found that talent management is here to stay for a long haul and it might change the way HR functions.

3. Objectives of the Study

The objectives of the present study are as follows:

1. To make the individuals realize their true potential and try to improve their level of performance.
2. To study the measurable set of factors that constitutes talent management.
3. To study the difference in the responses of automobile industry and IT service sector employees with regard to a set of factors that constitute talent management.
4. To access the talent inventory in terms of identification of talent gaps and identification of issues/challenges affecting the talent pool.

4. Hypotheses of the Study

H_{01}: There are no measurable set of factors that constitute talent management.

H_{A1}: There are measurable set of factors that constitute talent.

H_{02}: There are no significant differences in the responses of automobile industry and IT service sector employees with regard to a set of factors that constitute talent management.

H_{A2}: There are significant differences in the responses of automobile industry and IT service sector employees with regard to a set of factors that constitute talent management.

5. Research Methodology

The research design used in this study is a descriptive research design. The non-probability convenience sampling method was applied in this study. The primary data were collected from the respondents through questionnaire, while secondary data were obtained from books, magazines, record and files maintained in personnel department of organizations. Primary data to test the hypotheses were collected by administering a structured questionnaire (Appendix) to a sample of 100 managerial personal working at the upper, middle and lower levels of different companies of automobile industry (50 respondents) and IT service sector (50 respondents) on a random basis. Various univariate and multivariate analysis tools like mean, standard deviation, and factor analysis, have been used to analyze the data along with the nonparametric independent group test, i.e., Mann-Whitney U-test. Chi-square test was also used to test the hypothesis and percentage and graphical tools were also used for analysis.

6. Data Analysis

The present study is based on the responses to a structured questionnaire. A structured questionnaire was designed that contained a list of 23 variables (Table 1) that help in determining an individual's talent.

Table 1: Descriptive Statistics

Variables	N	Mean	SD
Exploit Orientation	100	7.25	1.035
Creativity/Innovation	100	7.28	1.336
Grave Result	100	8.25	1.241
Customer Course	100	8.22	1.563
Employee Skill	100	8.90	1.178
Leadership	100	8.67	7.102
Teamwork	100	7.92	1.458
Technical Expertise	100	7.72	1.367
Future Course	100	7.60	1.452
Worth Direction	100	8.40	1.771
Fluency	100	7.52	1.557
Decision-Making Study	100	8.21	1.254
Verbal Communication	100	7.55	1.875
Written Communication	100	7.50	1.214
Profit-Making Awareness	100	7.32	1.369
Strategic Awareness	100	7.33	1.147
Interpersonal Sensitivity	100	8.59	1.258
Flexibility	100	8.00	1.852
Spirit	100	8.11	1.741
Personal Motivation	100	8.31	1.452
Questioning/Probing	100	7.54	2.785
Accountability	100	8.12	1.365
Associations/Integration	100	7.84	1.452

7. Factors Analysis

Factor analysis was deemed necessary since it was considered prudent statistically to ascertain whether the adopted list of variables pictured different dimensions of talent. To check the sampling adequacy, Kaiser-Meyer-Olkin (KMO) measure was used. This statistic should be greater than 0.5 for satisfactory analysis. For the scale, the KMO measure was obtained as 0.720, and therefore, it was satisfactory. Bartlett's test is significant, i.e., the associated probability is less than 0.05. This implies that the items included in the scale are correlated to each other.

Table 2: Output for Mann-Whitney U-Test

Variables	Mann-Whitney (U)	Wilcoxon (W)	Asymp. Sig. (2-Tailed)
Exploit Orientation	764.000	1,459.000	0.662
Creativity/Innovation	668.500	1,112.500	0.638
Grave Result	537.500	1,423.500	0.442
Customer Course	561.500	1,478.500	0.561
Employee Skill	525.500	1,461.500	0.453
Leadership	536.000	1,417.000	0.418
Teamwork	593.500	1,456.500	0.348
Technical Expertise	689.000	1,369.000	0.710
Future Course	542.000	1,481.000	0.656
Worth Direction	591.500	1,521.000	0.326
Fluency	658.000	1,291.000	0.121
Decision-Making Study	542.000	1,321.000	0.116
Verbal Communication	497.500	1,365.500	0.152
Written Communication	499.500	1,321.500	0.586
Profit-Making Awareness	477.500	1,365.500	0.689
Strategic Awareness	654.500	1,451.000	0.430
Interpersonal Sensitivity	653.000	1,489.000	0.699
Flexibility	621.500	1,461.500	0.414
Spirit	568.500	1,561.500	0.258
Personal Motivation	549.000	1,231.000	0.174
Questioning/Probing	765.000	1,356.000	0.651
Accountability	658.000	1,331.000	0.899
Associations/Integration	658.00	1,233.000	0.961

Thus factor analysis used for analyzing the data. All the factors have a loading of more than 0.40.

A principal component analysis with subsequent rotation (varimax) was conducted on 23 items related to talent variables. All communalities (i.e., proportion of variance explained by the common (factors) varied from 0.852 to 0.720.

8. Mann-Whitney U-Test

An independent group Mann-Whitney U-test was conducted to evaluate the null hypothesis (H_{02}) that no significant differences existed between the responses of the employees of the two sectors, i.e., automobiles industry and IT service sector.

Table 2 present the results of Mann-Whitney *U*-Test. All variables are significant at 5% significance level. Thus, the null hypothesis is accepted. Therefore, there are no significant differences in the responses of automobile industry and IT service sector employees with regard to a set of factors constitute talent management.

9. Conclusion

Descriptive statistics test was used to identify whether there are measurable set of factors that constitute talent management. H_{A1} the alternate hypothesis was accepted. Thus, there are measurable set of factors that constitute talent.

The paper further used Mann-Whitney *U*-test to identify whether there are significant differences in the responses of automobile industry and IT service sector employees with regard to a set of factors that constitute talent management. The results reveal that there are no significant differences in the responses of automobile industry and IT service sector employees with regard to a set of factors that constitute talent management.

Hence, we can conclude that talent can be measured and that whatever can be measured can be managed.

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Appendix

Questionnaire				
Employee Name and Age:			Date:	
Company Name:				
Factor	**Agree**	**Strongly Agree**	**Neutral**	**Strongly Disagree**
Exploit Orientation				
Creativity/Innovation				
Grave Result				
Customer Course				
Employee Skill				
Leadership				
Teamwork				
Technical/Expertise				
Future Course				
Worth Direction				
Fluency				
Decision-Making Study				
Verbal Communication				
Written Communication				
Profit-Making Awareness				
Strategic Awareness				
Interpersonal Sensitivity				
Flexibility				
Spirit				
Personal Motivation				
Questioning/Probing				
Accountability				
Association/Integration				

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Job Conditions Mediating the Relationship between Commitment to Managers and Company and Employee innovation

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Abstract

Previous research on job conditions, commitment to managers and company, employee innovation have been done standard employee of hotel industry. Empirical research need to be done on non-standard employees (students) of the hotel who are actively participating in the achieving organization goals. Therefore, this research has aim to test the mediating impact of job conditions between commitment to managers and company and employee innovation.In this study, we have taken response on structured questionnaire from 135 hospitality students of three important education institutes of India. These all students were pursing either undergraduate program or post graduate program and have completed at least two industrial training in five star hotels for six months. Data were collected through structured questionnaire containing structured scales of commitment to managers & company, job conditions, and employee innovation. Reliability and validity was tested then proposed relationships were being tested by deploying series of separate hierarchical regression analyses. Baron and Kenny's guidelines have been used to test proposed mediation hypothesis. Finding are consistent with standard employee of previous studies. This study showed that all three latent variable (Commitment to managers, Job conditions, and employee innovation. are having positive correlation among themselves. As per Baron and Kenny's guidelines job conditions completely mediates the relationship between commitment to managers and company and employee innovation.

This study acknowledges certain limitations. First, this study has cross-sectional survey design, therefore cause and effect relationship cannot be established. Second limitation due to students as respondents, other nonstandard employee of hotel has not been included in the study. Hotel industry can make liquid workforce proactive by improving their commitment to manager and company, job conditions, and personal benefits. Hotel managers should focus on job conditions in order to enhance the impact of commitment to manager and company on employee innovation.

Keywords: Student nonstandard employee, Hotel Industry, commitment to manager & company, job conditions, and employee innovation.

Introduction

Service sector is being considered as a prime sector for India's economic growth. In the last 15 years Indian hospitality is growing very fast due to increase in domestic travel, innovation in industry offerings, and government support for infrastructure development, 49 % Foreign direct investment (FDI) in civil aviation sector, increasing number of internet users, ever increasing connectivity with domestic and international destination, emerging of new customer segment (baby boomers, double income no kids), new forms of tourism (MICE, Medical, Health), industry

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loyalty programs and promotions are significantly contributing in the development of hospitality industry in India(National skill development corporation, 2017). This industry has immense opportunity in India but some hurdles have been acknowledged by experts such as high growth rate with little increase employee productivity (Hiemstra, 1990), supply and demand of rooms in all seasons (CII, 2012), employee turnover, and low wages etc. (Denvir& McMahon, 1992) mention that in order to deal with these challenges, industry need to make more appropriate and flexible job conditions for employee innovation.

In today's era of global competiveness, earning employee commitment is a desire for every organization in order to get expected outcome from their employees. Those days are gone, when employee used to work for one or two employers in their entire careers. In present era, employees leave their commitment as soon as they get better opportunity in the market (Briscoe & Hall, 2006). Today's volatile employment conditions have increased the level of ambiguity regarding what employees can expect and what they want from the employment relationship (Arthur et al., 2005). In all sectors, financial performance of the organization is determined by employee participation and commitment (Boltanski & Chiapello, 2000). Human resource of any organization plays very vital role for competitiveness, survival, and creation of positive image in client's mind (Ariza-Montes et al., 2017). An employee's dedication, emotional investment, continuous commitment to the organization is the pivotal factor for long term survival of the organization (Bakker &Schaufeli, 2008). Vance (2006) stated that highly engaged and committed employees give competitive advantage to their organization by increasing productivity and decreasing employee turnover.

In tourism and hospitality industry, employee personality is recognised as most important predictor of employee performance and more emphasis being given on job position and human values because human values are predictor of level of commitment and motivation (Ariza-Montes et al., 2017). In order to determine hotel industry success, use of liquid knowledge workers, employee commitment and employee proactivity are very crucial aspects. Committed and proactive nonstandard employee/ liquid workforce may help to deliver services beyond the customer expectations.

Hotel employees who have positive perception about training, development, recruitment and selection policies of their organization are found to have positive and significant affective commitment towards their organization. Training and development practises, performance appraisals, hiring practices, and communication contribute affective commitment but training and development contribute highest among all of them (Nassar, 2017). Hotel employees' attitude and behaviour can be shaped by implanting employee oriented human resource management practices. Good HRM practices help in building an environment in which employee show cooperation and coordination in order to achieve organizational goals. Therefore, there is a close relationship between employee commitment and HRM practices (Ahmad & Schroeder, 2003).

Hospitality industry in India

Hospitality is all about being kind, welcoming and looking after the basic needs of human beings, mainly in relation to food, drink and accommodation. Hospitality industry comprises of four important areas like travelling, lodging, food service and recreation and its demand for huge skilled, semiskilled and unskilled manpower in order to create memorable customer experiences. Ministry of tourism, India (2012) has conducted research for the assessing the requirement of manpower in hospitality sector which says that Gross annual demand of employees in the hospitality sector has crossed 500,000 in 2009 – 10 and is likely to grow to almost 920,000 in 2021 – 22. The total employment is likely to increase to 76 lakhs by March, 2022.

Accommodation units will have the largest number of employees at over 44 lakhs, followed by eating outlets at 24 lakhs. Medical wellness is also likely to become a substantial employer, with a little over 600,000.Housekeeping, front office, food and beverage service are contributing highest percentage in any hotel workforce followed by security and administration. Managerial staff contributes least. India presently has an estimated 114,000 hotel rooms spread across various hotel categories. This is around 150,000 rooms short from what is required. (Hospitality Insight, CII, 2012).There is a huge gap between demand and supply of manpower in Indian hospitality industry due to inappropriate training infrastructure, high growth rate increases the demand for manpower, high attrition rate. The academic inputs are focusing on operational aspects not on building management competencies such developing national and international brand, cost management, and building brand equity. Therefore, these hospitality graduates are not able to see career opportunities beyond the four major functions (housekeeping, food production, food and beverage service, and front office) of this industry Jauhari (2006).

Student as liquid knowledge worker in hotel industry

For last many years, training and skill development are the key challenges of hospitality industry in order to delight the customer and it will remain the area of concern because new generation of employees are coming and industry has very high turnover (Davidson et al. 2011). Role overload has positive impact on employee innovation and role ambiguity and role conflict have inverse impact on employee innovation. Role overload and employee innovation relationship is mediated by quality of relationship between employee and employer (Montani et al., (2017).Walsh, (2016) stated that career based job features (challenging work, learning), trusting relationship with customers and extrinsic rewards having positive impact on employee commitment and motivationHuman resource plays very vital role for competitiveness, survival, creation of positive image in client's mind. Therefore, human resource department should focus on human values and job position during the final selection because human values determine the level of commitment and motivation (Ariza-Montes et al., 2017).

In order to become a good hospitality professional, Chung, K. Y. (2000) found fundamentals of Marketing Management, Hotel management, foreign language basics, accounting, finance, f & b service, communication, hotel administration, hotel engineering and room division management, are found most important subjects and hospitality students have to acquire certain skills such as ability to innovate, commitment to work, ability to understand market trends, ability to understand financial operations, customer service orientation and global exposure but Indian hospitality institutes are not sufficient to imbibe these skills in their students due to out-dated curriculum, teaching methodology and inefficient faculty in teaching management aspect of this industry Jauhari (2006). Industrial training provides an opportunity to know and acquire job competencies. It can be used as a tool to equip necessary managerial competencies in students. Indian hotels are not providing quality industrial training. Therefore, duration and content of training need to be upgraded in order to produce industry relevant, brand ambassadors, committed and motivated workforce for this industry (Jauhari, 2006).

Use of hospitality student as a liquid workforce is a win - win situation for both. Industry need relevant workforce to delight its customer but student do not have appropriate amount of knowledge and skill because educational institutes are training only for operational competencies not for managerial competencies in Indian private and public hospitality education institutes Jauhari (2006). For hotel industry, liquid knowledge workers may help to reduced employment cost Kalleberg el al., (2000) adjustment in size as per the fluctuations in the market Kalleberg el al., (1997) to expand work force Worland & Wilson (1988).

Indian hospitality industry is having weak market conditions. It is characterized by excess labour, lack of minimum wage rate, a bureaucratic organization structure, long working hours, etcJauhari (2006). Weak marketing condition will not create workable climate for liquid workforce. Reskin and Hudson, 2000 named nonstandard jobs as bad jobs due to certain characteristics like less compensation, no health insurance, no job security, lack of protections from unions and labour laws (Ferber and Waldfogel 1996; Kalleberg et al. 1997; Mishel, Bernstein, and Schmitt 1999) even they have similar personal characteristics and education qualification. Therefore, policy makers have to rethink about the policy of nonstandard employment/liquid knowledge workers benefits such as health insurance and employee rights etc (Kalleberg et al., 2000). Broschaket. al., (2008) stated interestingly that after retaining contingent workforce/nonstandard workforce, managers should not expect any incremental change in productivity, commitment and helping behaviour.

Despite many positive aspect of liquid knowledge workers, it may have certain negative such as negative social psychological reactions among supervisors, peers, and work groups Broschak& Davis-Blake (2006) and able to create pressure groups Olsen (2006). These effects are more visible on those employees who are at lower positions in organizational hierarchy than who are at higher in hierarchy. But students are considered as special case of liquid knowledge workers. Connelly & Gallagher (2004) stated that contingent work is a multidimensional concept. It has many difference in contract terms and also differences in their job. In literature nonstandard employee and liquid work force has been used interchangeably.

The present study advances research and practice in several ways. First, it contributes the literature on commitment to manager and company, job conditions and employee innovation in the hospitality (student as nonstandard employee) context. This area has the potential to improve employee innovation with the help of nonstandard employee. Second, this study concludes that employee commitment is important for employee innovative work behaviour but this relationship can be mediated by good job conditions. To the best of our knowledge, the present studies examine how good job conditions mediate the relationship between employee commitment and employee innovation.

The paper is structured as follows. The next section discusses arguments leading to the hypothesis. The method and results section presents detail about the sample study, the measures used in the study and the data analysis performed. The final section discusses the main findings, the implications of the results for both theory and practice, the limitation of the research and the direction for the future research.

Theoretical Background and Hypotheses

Mediating the role of job conditions in the relationship between commitment to managers and company and employee innovation (innovative work behaviour at work place)

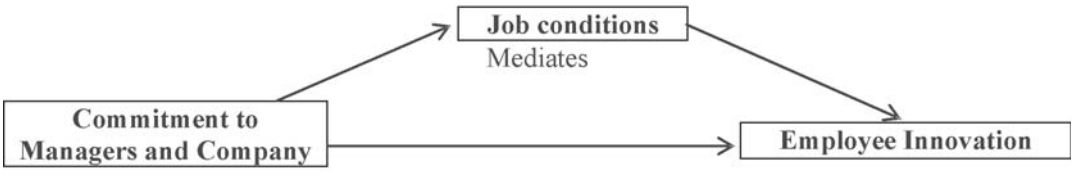


Figure: 1 Conceptual model

Service organizations can build stronger organization commitment and reduce intention to quit by providing job features important to their careers. The job features could be opportunities to perform challenging work, experience trusting relationships with customers/clients, and obtain extrinsic rewards (Walsh, 2016). Employee career oriented job conditions may be useful to get employee innovative work behaviour at workplace. Conventional human resources theories, developed some 50 years ago by Maslow and Herzberg, suggest that satisfied employees tend to be more productive, creative and committed to their employers. The success of productivity improvement strategy is dependent on employee commitment, job satisfaction, skills, and motivation.Job satisfaction and organization commitment found the strongest predictor of intention to quit (Cohen et al., 1991). If employees are planning to quit the organization then they may not be willing to contribute meaningfully in order to enhance the growth of an organization. Job conditions like departmental cooperation, skill utilization, task significance, job security, job involvement, task clarity and staff support are able to differentiate the employee commitment in low, medium, and high levels (Cohen et al., 1991). High level commitment is necessary to get innovative work behaviour from employees. Then, organizations need to provide best work place to work for getting innovative performance from their employees. Hsu and Chen, (2015) found that organization innovation climate is most effective predictor of creativity and organization innovation. Their study results showed that positive psychological capital fully mediates the relationship of organization innovation climate and organization innovation. A good job condition helps to develop positive organization behaviour which may lead to organization innovation.

Organization behaviour research has summarized that employee becomes more committed to company and mangers, when they are getting good job conditions for performing job. Good job conditions includes authentic leadership (Zhou et al., 2014; Delegach et. al, 2017), relations with supervisors and social involvement (Fukami et. al., 1984), labour-management relationship climate, job satisfaction and company tenure (Kim & Rowley, 2006), supportive HRM environment practices (open communication, empowerment, participation, investment in employee development) (Rubel et. al., 2017), positive work experiences (Meyer et. al 1998), decision making quality (Joe,2010), managerial coaching, role clarity, and satisfaction with work have (kim, 2014). Committed employees perform their job beyond the expectations of an organization. Person organization fit predicts job satisfaction and organization commitment (Cho, 2017). Job self-efficacy is as important as organizational commitment, because they are both critical to great performance (e.g., Lent, Brown, & Hackett, 1994). Employee commitment has positive impact on customer, supplier, internal integration and organisation's performance. Internal integration leads to better supplier management, customer integration and improved organisation's performance (Hooshangi et al., 2017; Alfalla-Luque et. al, 2015).

Human resource management (HRM) has a role in generating new knowledge, motivating employees, and supporting the hotel to gain a sustainable competitive advantage over other firms (Bae& Lawler, 2000). Good job conditions helps to earn employee commitment and build confidence about the capability for performing job. Human resource (HR) practices such as job satisfaction, employee commitment, workplace friendship and team culture have been noted to be promoting and regulating employees' behaviour (Swart and Kinnie, 2003). HR practices have been found to be associated with employees' pro-social behaviour (Cetin et al., 2012). Employee commitment, workplace friendship and team culture predicts knowledge sharing in service firms (Boateng et al., 2017). Knowledge sharing and employee innovation both are positively related, creative self-efficacy mediates the relationship between knowledge and employee innovation and job satisfaction makes stronger the relationship between creative self-efficacy employee innovation (Hu and Zhao, 2016). Pro social behaviour leads to knowledge sharing and knowledge sharing leads to employee innovation. Learning strategies mediates the relationship job design and employee innovation process (Gao et al., 2011).

Employee innovation is essential for organization innovation, especially in service firms (Li & Hsu, 2016). Employee behaviour at work place is critical factor in order to keep an organization competitive and affluent. Job autonomy and time pressure has positive influence on innovative work behaviour (De Spiegelaere et al., 2015). There are various factors which has positive influence on employee innovation such as employee's problem solving network (Grosser et al., 2017), role overload and employee innovation relationship is mediated by quality of relationship between employee and employer (Montani et al., (2017), individual performance related pay weakens the relationship task – level job resources like learning opportunities and employee innovative work behaviour but this relationship become more strong, when individual and collective performance related aligned with pay (De Spiegelaere et al., 2016), managerial support was the most proximal contextual influence on innovative behavior and mediated the effect of organizational support and national culture (Lukes et al., 2017), Job satisfaction mediates the relationship between psychological climate for creativity and work performance (Yee et al., 2014).

H1. Job condition mediates the positive influence of commitment to manager and company on employee innovation (innovative work behaviour)

H1a There is no significant relationship between commitment to managers and company and job conditions

H1b There is no significant relationship between commitment to managers and company and employee innovation (Innovative work behaviour)

H1c There is no significant relationship between job conditions and employee innovation (innovative work behaviour)

H1d There is significant relationship between commitment to managers and company and employee innovation (Innovative work behaviour) in the presence of mediating variable job conditions.

Method

Sample and data collection

This research is conducted on hospitality students who are studying in their final year at various private and government education institutes of India. We used printed questionnaire to collect the primary data and these questionnaires were collected from the students in the presence of faculty members of that particular institute. We administered survey questionnaires directly to students while industry report presentation at their teaching institute for 5-6 days in three education institute of India. In survey, questions were asked related to basic demographic and attitude toward the reasons for loyalty and employee proactivity in the organization. While collecting the questionnaire from students, it was ensured that students understand the purpose of study for getting the appropriate and honest response. Participants (students) who have completed at least two six months training in five star hotels in India and prepared to join hospitality industry in coming next six months. The 150 questionnaires were distributed at three prestigious education institutes (Lovely Professional University, Institute of Hotel Management, New Delhi, and Punjab University) but 135 questionnaires were selected successfully for the study. In order to understand the overall industry training experience, we had interacted with 35 students of all three education institutes.

All 135 participants are below 25 ages. Out of 135 students, 93 (68.9%) male students and 42 (31.1%) female students have given their response. These all students have completed their training in five star hotels in all four major departments like front office, housekeeping, food production, and food and beverage services department across 15 states of India. 54 (40%)

undergraduate students and 81 (61%) post graduate students have participated in this survey. 120 (88.9 %) undergraduate and post graduate students believe that market is having full of opportunity for hospitality students but 15 (11.1%) students are not optimistic about the availability of opportunities in the market.

Measures

Specific scales have been used to obtain responses from respondents. Detail information about various scales mention below along with cronbach's alpha results.

Commitment to manager and company

To measure commitment to manager and company, we adopted Ineson et al. (2013) five items scale. A sample item of this scale is "I enjoy good communications with my managers". The sale has shown an internal consistency (alpha) reliability of .95 in this study.

Employee innovation

Innovative work behaviour is measured using six items scale developed by Dhar&Dhar (2009). A sample item of the scale is "People are able to generate new ideas and put them into practice". The reliability (Alpha) of this six item scale is .92.

Task significance

Innovative work behaviour is measured using six items scale developed by Dhar&Dhar (2009). A sample item of the scale is "I find similarities in my values and the organization's values". The reliability (Alpha) of this six item scale is .92.

Personal benefits

To measure personal benefits, we adopted Ineson et al. (2013) four items scale. A sample item of this scale is "The salary offered is good". The sale has shown an internal consistency (alpha) reliability of .91 in this study.

Job conditions

To measure job conditions, we adopted Ineson et al. (2013) five items scale. A sample item of this scale is "I receive good training with this company". The sale has shown an internal consistency (alpha) reliability of .95 in this study.

Control variable

We have used four control variables in our study such as gender, education and market opportunity and training department. Gender is measured as categorical variable coded as 1 for male and 2 for female. These all students are pursuing either post graduate or undergraduate course. So education is measured as dichotomous variable coded 1 for undergraduate and 2 for post graduate and availability of market opportunity is also measured as categorical variable coded as 1 for Yes and 2 for No.

We have also controlled training department of students. Previous research has mentioned training department of student may change the perception of students due to different working culture, work load, and different timings. So students training department measured as categorical variable coded for 1 if student did entire training in one department, coded 2 if student did training in two departments, coded 3, if student competed training in 3 department and coded 4, if student has done training in all four major departments (Housekeeping, Front Office, Food & beverage service, and Food production) of hotel.

Analysis Strategy

Mediation through regression

Table 1: Inter-construct correlations

	Employee Innovation	Job conditions	Commitment to company and managers
Employee Innovation	1		
Job conditions	.890**	1	
Commitment to company and managers	.824**	.861**	1

Results

Hypothesis Testing

We have used hierarchical multiple regression analysis to test our hypothesis. All regression analysis has been performed by using SPSS 20. Hypothesis 1 stated that job conditions mediate the relationship for commitment to company and managers with employee innovation. As per Baron and Kenny (1986) mediation guidelines, there are four necessary conditions: (1) the independent and mediating variables must be significantly related; (2) the independent and dependent variable must be significantly related; (3) the mediator and dependent variable must be significantly related; and (4) the relationship between the independent variable and dependent variable should be non-significant or weaker when the mediator is present.

The regression results for testing mediation are present in Table 2.

Table 2: Regression Results for Testing Mediation

	Employee innovation			Job conditions (Mediator)		
Commitment to managers and company	Step -1	Step – 2	Step -3	Step - 1	Step – 2	Step -3
	.82**					
			.22			.69**
Employee Innovation					.89**	
	N = 135; **p < .01					

Results in Table 2 show that, commitment to managers and company is positively associated with job conditions (β = .69, p < .01). Thus condition 1 is supported. Commitment to company and managers is positively related with employee innovation (β = .82, p < .01). Thus, Second condition for mediation is supported. Job conditions and employee innovation have significant positive relationship (β = .89, p < .01) which supports third condition for mediation. Further, results show that after job conditions is taken into account, the effects of commitment to company and manager became weaker, and insignificant, which suggest that job conditions completely mediates the relationship of commitment to company and managers with employee innovation.

Discussion

Theoretical contributions

This study significantly contributes to existing literature. First, the study enhances our knowledge about the nonstandard employee (students) behaviour and attitude. The relationship between commitment to company and managers and employee innovation and job conditions mediates this relationship. Commitment to company and managers act as antecedents of employee innovation. Managerial support was the most proximal contextual influence on innovative behavior and mediated the effect of organizational support and national culture (Lukes et al., 2017). The mediating effect of job conditions on commitment to company and managers - outcome relationship contributes to the literature by showing the committed employee may show innovative work behaviour, if they perceive good job conditions. Job satisfaction mediates the relationship between psychological climate for creativity and work performance (Yee et al., 2014).

Second, the study has significant contribution in term of its unique sample. Examining the process of workplace motivation in hotel's non-standard employees (hospitality students) who can play very vital role in managing workplace fluctuations. There are many studies which have examined the workplace innovative behaviour but limited studies made an attempt to examine the behaviour of non-standard employees (hospitality students). The results of study exhibit that committed employees to company and managers how it influences innovative work behaviour while taking into the considerations job conditions perceptions.

Practical implication

This study acknowledges certain important managerial implications. The relationship among employee commitment to company and managers, employee innovation and perception about job conditions can play very vital role in motivating employee for innovative work behaviour. Previous research has highlighted that employee commitment has positive influence on employee performance at work place. Many hotels today face competitive and rapidly changing operating environments because of changes in labor markets, advancement in technology, globalization, and regulation. They, therefore, need to find a way to gain a competitive advantage in these dynamic markets. Hotels' success now depends on their ability to continuously improve their performance and, at the same time, reduce operating costs (Ahmad & Schroeder, 2003).One of the significant challenges modern organizations and leaders face is the limited commitment of employees to their organizations (Delegach et. al, 2017).Hotel managers should improve managerial support (Lukes et al., 2017), psychological climate for creativity (Yee et al., 2014), Managerial coaching, role clarity, and satisfaction with work have(Kim, 2014), job involvement (Barling et al., 1990), Relations with supervisors and social involvement (Fukami et al., 1984), decision making quality (Joe, 2010), performance related pay like learning opportunities (De Spiegelaere et al., 2016), employee-management relationship climate (Kim & Rowley, 2006), provide supportive HRM environment (open communication, empowerment, participation, investment in employee development (Rubel et. al., 2017), positive work experiences (Meyer et. al 1998). These all practices will help hotel managers to earn commitment of nonstandard employees. This employee's commitment for company and managers will lead to positive organizational outcomes such as innovative work behaviour at work place. Satisfaction with pay makes employee more committed to their careers (Walsh, K. 2016).Organizations expectations from employee are keep on changing in dynamic environment. Therefore, to competitive environment,organizations need to go beyond the general commitment in order to achieve more specific organizational goals (Delegach et. al, 2017).

Limitation and Future Research Directions

The results of this study cannot be generalized because this sample is not true representative of student as nonstandard employee in Indian service organization. In future student of different service industry like hospital, telecom and other can be taken for further study. In this is conducted only on the hospitality student of three educational institutes. Therefore, in future study can be done on all students who are studying in various educational institute of India. However, the scope of the study is limited to only student as nonstandard employee. So interestingly, this study can be extended to other nonstandard employee of hospitality industry and comparison can be done between student as nonstandard employee and nonstandard employee.

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pp. 427-436

Role of Flexible Working Timing in Managing the Employees of Organisations: A Case Study of Flexible Work Timing of Some Retail Outlets in Patna Region

Faryas Kausar Ansari[1]

Abstract

With the advancement in technology, the working environment has become more competitive in the retail sector. Every organisation aims to maximize their profit through optimum utilisation of limited resources. Employees are performing different kinds of role in an organisation. Employees are trying to balance work life and personal life these days. Nowadays retailers are using flexible timing arrangements as a tool to motivate the employees. The purpose of the study is to know the role of flexible work timing in managing the employees in terms of smooth functioning of the organisation. The research study revolve around three elements of flexible work timing i.e. changes in hour (flexi-time), part-time and shift-work.

A questionnaire based on five point likert scale has been prepared for this study.Data was collected by the simple random sampling method. Target sample of this research consisted of 327 employees of Big-Bazaar, V-Mart, Vishal Mega Mart, Pantaloon and Reliance Trendz in Patna. Chi-square has been used to test hypotheses by using the statistical packages for social science(SPSS)software.

Keywords: Changes in hour, flexible work timing, part time and motivation, shift work

1. Introduction

Flexible work timing, as the name implies, is a way of working and providing employment under different job conditions. Flexible working is a way of working that suits an employee's needs, an example having flexible start and finish times, or working from home. *Flexible Working gives employees flexibility on how long where and when they work. Employees access flexible working through human resources policies, which usually require supervisory approval.* The flexible working hours consists of part-time, overtime, long-term leaves, job sharing, flexible time and shift work. The working time refers to the degree of flexibility, gender equity, negotiation structure and diversity of working time.

Each employee working in an organisation wants some kind of freedom for their own development. As a human being, every individual have to take care of his health and mind. Working for the whole day with no changes in his regular schedule makes an employee dull and inefficient due to fatigue at his workplace. Even as a family person, he or she is not capable of fulfilling his responsibilities at home. Working individuals have to face challenges at their workplace and at home. Working under stress and pressure, employees start losing their confidence, efficiency, effectiveness and productivity.

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So, it is important that employees are treated well as a human being not as machines at their workplace. Job satisfaction and motivation play an important role in enhancing the employee's performance.

Flexible Work Timing can be seen from the perspective of the employer or the perspective of the employee. 'Employer-friendly' forms of working time flexibility are those that allow organizations to bring human capital in line with the temporal requirements following from business, while 'employee-friendly' forms of working time flexibility are those 'that provide workers with the freedom to adapt their working hours and schedule to meet their own personal and family needs'.

Different Kinds of Flexible Working Used in an Organisation

Flexible working covers a number of different working practices, from shift work, seasonal work, weekend working, temporary contracts of employment and part - time working as well as tele-working, flexible hours, sub-contracting and many variations of these, which have evolved to suit particular people and jobs. According to recent research, European employers are exploiting nearly all forms of flexible working, in all industry sectors and in all countries, although obviously there are variations by country, size of organisation and industry sector.

The study, recording responses from the European Association of Personnel Managers (EAPM) divides the types of flexible working arrangements into different categories. *Flexibility in the number of working hours or the distribution of working time includes* :

- Part-time working ;
- Job-sharing;
- Flexible work time including banked hours/time off in lieu;
- Annualized hours;
- Flexible daily hours;
- Term-time working;
- Overtime; and
- Shift-working

2. Literature- Review

The impact from changes in the economy, technology, social and lifestyle in today's environments have boosted the awareness of flexible working arrangements in an organisation.

Cook (1992) suggested that through the implementation of flexible working hour's schedule, the responsibilities over children's safety and education will be more secured. This is due to the fact that they are able to engage in a better coordination between work and responsibilities to the family. Smith (1993) pointed out that working women should have a balance between tasks in the office and responsibility to the family especially on safety, health and children need. Cushway (1994) argued that the implementation of flexible working hours is an effective stage to increase productivity without increasing the workforce.

However, almost alongside this recognition came the concern with issues of employee access and take up, the gatekeeper roles of line managers and changing workplace cultures if working patterns were to change substantially for a sizeable group of workers (Lewis,and Lewis, 1996; Lewis and Taylor, 1996).

Evidence from the previous study indicated that the competitive working environment and increasing workload had caused family and personal life being neglected (Mary & Chris, 1998). This statement is then further supported by Emmott and Hutchinson (1998). They found out that the implementation of flexible working hours schedule could increase and balance women's responsibilities in work and family.

A recent British data set, the 1998 Workplace Employee Relations Survey (WERS), offered a rare opportunity to examine the overlap between employees' and employers' responses on the topic of flexible working arrangements because it contained information from employers and from samples of their employees on the same subject. A number of factors are required to be taken into consideration while designing a workplace that is fundamental, an integral part of the work itself, besides the tools of work. For developing a conducive workplace, awareness is required about the manner in which workplace puts an impact on behavior and the manner in which behaviour propels the performance at the work place. Different spaces have different characteristics. Understanding of workplace is increasing, based on this belief. Space performs various functions and people work differently. People work individually, jointly and collectively and therefore, need to interact with others. This necessitates varying workplace solutions (Genevieve Giulianoet, al., 19990). A research was conducted on behalf of the architects, covering 200 business managers of the UK. They supported the contention that improvement in the workplace would lead to an increase of 19% in productivity of employees and 17% of the individuals. As such, workplace improvements have impacts on the overall economy.

It is a fact that children need love, food, safety and parents' attention to ensure that children lead to a normal life. This complies with Maslow's theory of motivation that emphasizes the aspects of safety, love, needs for food, esteem, and self-actualisation that needs to be fulfilled by an individual in order to increase the motivation at work. In line with the continuous improvement initiative to uplift the service delivery system to the public, flexible working hour's schedule which is also known as Staggered Working Hours (SWH) has been implemented in the Federal Territory of Kuala Lumpur commencing 1st May 1998. In fact, the government has agreed for the SWH to be extended to all agencies in the Federal Government throughout the country. The key objective of this policy is to increase the service quality and extend service duration to the public. In order to ensure the effectiveness of SWH, the characteristics of employees' satisfaction and motivation at work should be addressed accordingly. As such, theemployer should play an important role in determining employee satisfaction, comfortability, and welfare. The first wave of interest in flexible working arrangements (known also as family friendly, work-life balance or work-life integration policies) recognised their importance for offering flexibility to workers, parents and others, to help reconcile work and (family) life in a pressured 20th century global business environment (Kamermanand Kahn, 1987, Bailyn, 1993; Bailyn et al 1997, 1998;). It is one thing for employers to offer employees flexibility, but if the availability is not communicated, or other conflicting messages are sent to the communication or line managers are not well informed and trained in implementing company policies, employees' knowledge about policies and take up of any provisions will be expected to be low. That employeeis not always aware of their employers' policies is well known and noted in qualitative empirical studies (for example, see Gill, 1996) including recent studies of work-life balance policies (Yeandle et al, 2002; Bond et al, 2002).

3. Objective of the Study

The objective of the study is to find out impact of different arrangements of flexible work timing on employees of various retail outlets in Patna.

- To find out the impact of flexible work timing (changes in hours) on motivational level of employees.
- To find out the impact of shift work on motivational level of employees.
- To find out the impact of part time on motivational level of employees.

4. Statement of the problem

The retail industry in India is booming and there is fierce competition after the globalisation. The work place is changing rapidly, creating new challenges and opportunities for retail sector. Retail sector consider flexible work time as a tool to help the employee to create a balance between work and personal life. The flexible working hours allows employees to focus on multiple roles, have a greater sense of responsibility, ownership and control of their working life, increase motivation level, satisfaction level, productivity, loyalty and commitment, able to focus on their work and to develop their career in today's competitive world. Various retail industries are practicing flexible work time in their organisation.

Retail industry started placing more importance on flexible work time to help the employees to work under their suitable timeframe.

This study emphasizes on impact of flexible work on motivation level of employees. Retail industries are practicing flexible work time to encourage employee. Does flexible work time have a significant relationship with motivation level of employee in the current scenario?

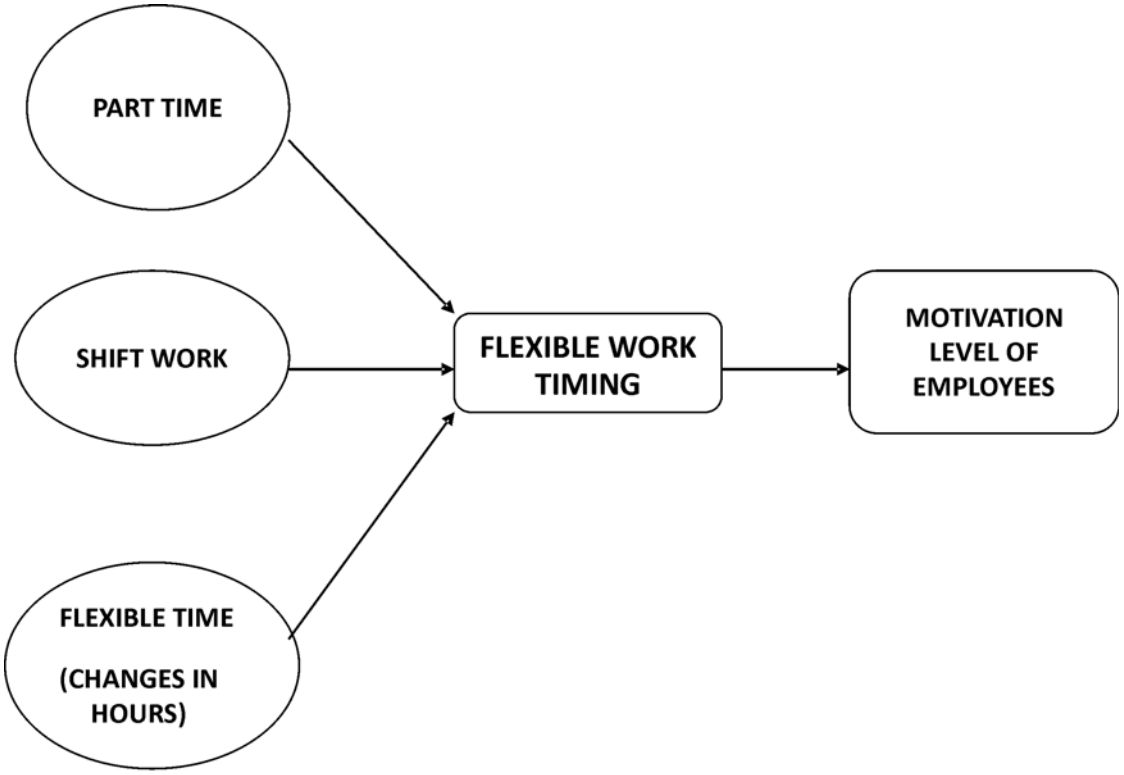


Figure 1: Theoretical Framework of the Study

5. Research Methodology

Table 1: Research Methodology in Brief

Research Approach	Deductive
Research Design	Descriptive research design
Sources of data collection	Primary method of data collection
Research instrument used	Self-Administered Questionnaire
Research Technique	Questionnaire(Survey method)
Sample location	Patna
Sample techniques	Simple Random sampling
Sampling unit	Employee of Big Bazaar, V-Mart, Vishal Mega Mart, Pantaloon, Reliance Trendz
Sample size	327 Customers
Target Population	18 years to 70 years
Research Data	Non parametric
Scale of Measurement	Nominal / Ordinal scale(5 point likert scale)
Analysis of Data	Descriptive & Inferential Statistics
Statistical Tool	Chi-square.
Variable of Study	Flexible work timing (Shift work, changes in hour, Part time work) and motivation of an employee.

On the basis of above table, the deductive approach will be used to formulate the hypothesis. The descriptive research design is used to arrive at conclusion of the study. The self-administered questionnaire was formulated for the primary method of data collection. A questionnaire based on five point likert scale has been prepaired for this study.Data was collected by the simple random sampling method. Target sample of this research consisted of 327 Big-Bazaar, Vmart, Vishal mega mart, Pantaloons and Reliance trendz employee of Patna.. We formulated three hypotheses: shift work, changes in hour and Part time work. Chi-square has been used to test hypotheses by using the statistical packages for social science(SPSS) software.

Interpretation of Data on the basis of Demographic Profile of Respondent

Impact of flexible work timing on Gender

Table 2: Gender Distribution

Gender	**Frequency**	**Percentage (%)**
Male	222	67.89
Female	105	32.11
Total	327	100.0

Source : Primary data 2017

Analysis: The above mentioned table shows that out of 327 respondents 222 were male which means 67.89% constitute the male respondents. Out of 327 respondents 105 were female which means 32.11% constitute the female respondents.

Table 3: Age Group

Age Group	Male No.	Male (%) (%)	Female No.	Female %	Total	
					No.	%
18-30	114	34.86	63	19.27	177	54.13
31-45	48	14.68	27	08.26	75	22.44
46-60	48	14.68	15	04.59	63	19.27
61 and above	12	03.66	0	0	12	03.66
Total					**327**	**100**

Source: Primary data 2017

Analysis: From the above shown table, it is clear that 34.86% of male respondents and 19.27% of female respondents are of the 18.30 age group.

14.68% of male respondents & 08.26% of female respondents comprises of the age group 31.45.

14.68% of male respondents, 04.59% of female respondents are of 46-60 age group. Only 03.66% of male respondents are above the age of 61 years.

Table 4: Educational Qualification

Educational Qualification	Male No.	Male %	Female No.	Female %	Total	
					No.	%
Upto 10th	24	7.33	9	2.75	33	10.08
Intermediate	90	27.52	60	18.34	150	45.86
Graduation	78	23.85	30	9.17	108	33.02
Post-Graduation	21	6.42	6	1.83	27	8.25
Professional	09	2.75	0	0	9	2.75
Total	222	67.87%	105	32.09%	327	100

Source: Primary data 2017

Analysis: From the above shown Table, it can be said that 7.33% of male & 2.75% of female respondents educational qualification is upto 10th.27.52% male respondents and 18.34% of female respondents educational qualification is upto intermediate. 23.85% of male respondents and 9.17% of female respondents are graduated. 6.42% of male respondents &1.83% of female respondents are having post-graduate degree. Only 2.75% of female respondents were having professional degree.

Table 5: Income Group

Income Group	Male No.	Male %	Female No.	Female %	Total No.	Total %
Upto 200,000 P.A	168	51.38	90	27.52	258	78.9
200,001- 400,000PA	30	9.17	15	4.58	45	13.754
400,001- 600,000PA	24	7.34	0	-	24	7.34
600,001 & above	0	0	0	0	0	0
Total					**327**	**100**

Source: Primary data 2017

Analysis: From the above mentioned table, it can be said that 51.38% of male & 27.52% of female respondents fall in the income group of 200,000 per annum (PA).

9.17% of male respondents & 4.58 of female respondents fall in the income group of 200,001-400,000PA. 7.34% of male respondents fall in the income group of 400,001-600,000PA.

Table 6: Do you think that part time work enhances your motivation level?

	Male No.	Male %	Female No.	Female %	Total No.	Total %
Yes	147	44.95	84	25.69	231	70.64
No	75	22.94	21	6.42	96	29.36
Total	**222**	**67.89**	**105**	**32.11**	**327**	**100**

Source: Primary data 2017

Analysis: On the basis of above shown table, it can be observed that 44.95% of male respondents and 25.69% of female respondents are in favour of part-time work and thinks it enhances their motivation level.

So, from the analysis, it is clear that 70.64% of respondents out of 327 respondents are motivated by part-time work in their work place.

Table 7: Do you feel that changes in hours (flexi time) motivate your performance?

	Male No.	Male %	Female No.	Female %	Total No.	Total %
Yes	149	45.57	87	26.61	236	72.17
No	73	22.32	18	5.50	91	27.83
Total	**222**	**67.89**	**105**	**32.11**	**327**	**100**

Source: Primary data 2017

Analysis: From the above mentioned table and diagram, it can be said that 45.57% of male respondents and 26.61% of female respondents feel that changes in hours motivate their performance.

So, it is clear that changes in hours (flexitime) motivate their performance at work place.

Table 8: Does shift work improves the performance of an employee?

	Male No.	Male %	Female No.	Female %	Total	
					No.	%
Yes	140	42.81	81	24.77	221	67.58
No	82	25.08	24	7.34	106	32.42
Total	**222**	**67.89**	**105**	**32.11**	**327**	**100**

Source: Primary data 2017

Analysis: On the basis of above shown table, 42.81% of male respondents and 24.77% of female respondents are in favour of shift work and agrees that shift work improves their performance at the work place.

Hypothesis Testing

The hypothesis for this study are as follow:

Hypothesis 1-

Ho. The performance of an employeeis not significantly influenced by shift work.

HI. The performance of an employee is significantly influenced by shift work.

Hypothesis 2-

Ho. The performance of an employeeis not significantly influenced by part time work.

HI. The performance of an employee is significantly influenced by part time work.

Hypothesis 3-

Ho. The performance of an employeeis not significantly influenced by changes in hour.

HI. The performance of an employee is significantly influenced by changes in hour.

Hypothesis Test Result

Table 9

Flexible Work Timing Elements	Pearson Chi square	df value	Asymp.sig Or P <.05	Result
Shift Work	6.450[a]	**1**	.011	**Accepted**
Changes in hour	8.793[a]	**1**	.003	**Accepted**
Part Time Work	6.530[a]	**1**	**.** .011	**Accepted**

The above table shows result of the hypothesis testing of all the three variables of flexible work time. The main purpose of this study is to know the significant relationship between element of flexible work timing and motivation level of employees.I have Three hypothese have been formulated for the research : shift work ,changes in hour and part time work.Chi-square

has been used to test the hypothesis by using the statistical packages for social science(SPSS)software.

The chi- square of shift work is6.450[a] .and the P value is .011 as shown in the significance(2side) which is below 0.05.it means that it accept the alternatives hypothesis. This means there is significant relationship between shift work and motivational level of an employee. Similarly the P value of changes in hour(.003) and part time work(.011) which are less than 0.05. This means all element of flexible work arrangements are significant with motivation level of an employee.

6. Findings

- The 3 most popular types of work timing arrangements in retail sector in Patna are changes in hour (flexi time), part time and shift work.
- On the basis of this research study there are 327 respondents from various retail outlets in Patna region. Comprising 222 male respondents and 105 female respondents.
- The most liked flexible work timing arrangement is changes in hour (flexi time). About 72% of employees like to work under flexi time arrangement.
- 70.64% of employees like to work under part time arrangement.
- 67.58% of employees are comfortable in shift work arrangement.

7. Conclusion

- From the analysis, it can be concluded that flexible work timing has motivational impact on employees' performance.
- It can be concluded that, part time work increases the motivational level of male & female employees respectively.
- It can be concluded that changes in hours (flexitime) has greater impact on male and female employees performance at work place.
- According to the present study it can be concluded that out of 3 flexible work timing arrangements i.e. part-time, shift-work and flexible work timing, most preferred type of flexible work arrangement among employees is flexi time (changes in hours) and shift work respectively.
- Thus, from the analysis it is can be concluded that flexible work timing helps in managing the employees of the organisation which results in overall better performance of the organisation.

8. Suggestions

- Retailers and marketers should emphasis on properly implementing of part-time arrangement in organisation because most of the college going students are attracted to work under part time.
- Retailers should also focus on changes in hours (flexitime) because it has great impact on male & female employee's performance at work place. 162 males out of 222 and 87 females out of 105 were influenced by flexitime.
- Retailers should put greater emphasis on shift work as maximum retailers provide shift work for the employees as the working hours are more than 12 hours. 168 males out of 222 and 84 females out of 105 were agreed that shift work improves their performance.

9. Limitations

- The data was collected from Patna region only, so sample was geographically limited.
- The result obtained might be based on the biased approach of the employees.
- Only three types of flexible work timing is taken into consideration.
- Only retail sector has been taken into consideration, producing result only for this particular sector.
- Time has proved to be a major setback in conducting the research study. Time was limited and the research could not be expanded.

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Supporting Culture as Transformational Strategy in Call Centres in India: Examining its impact on Job Satisfaction with Stress and Career Advancement as Mediators

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Abstract

The volatile, uncertain and challenging global business environment has resulted in organizations adopting innovative strategies to enhance their performance and sustain their competitive advantage. Organizations are trying to develop and sustain a culture which can provide them a strong foundation. This paper tries to examine the relationship between supportive culture and job satisfaction mediated by stress and career advancement by using the data collected from women employees of call centres located in Delhi and NCR. Multiple regression is used to analyze the data and test the hypotheses. The findings indicate the significance of supportive culture in enhancing the satisfaction of women employees in call centres in India.

Keywords: *Culture, Job satisfaction, Women, Call centres, Stress, Career advancement.*

Introduction

Organizational culture has been widely acknowledged as the critical factor in determining the success of organizations. It is considered as an important parameter of sustainable competitive advantage (Schein, 1990, Zheng, et al., 2010). The effectiveness of strategies and systems implemented in the organizations are explained by the culture adopted (Prajogo and Sohal, 2001). Culture consisting of values, beliefs, norms, communication, relationships and practices, etc lays the foundation of any organization. Organizational culture can be strong or supportive or weak. Strong and supportive culture leads to development of good systems and right structures which acts as a transformational strategy to achieve organizational effectiveness.

The objective of the study is to provide insights on the effect of supportive culture on job satisfaction of women employees in call centres in India with stress and career advancement acting as mediating variables. The scheme of the paper is as follows. The next section describes the theoretical framework to gain a more detailed overview of existing research on the topic. Section 3 deals with the research methodology employed and data analysis. Then, in section 4, the results of the study are reported. Results are discussed in section 5. Finally, the paper concludes with an overall outlook which is included in the last section.

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Theoretical Framework and Hypotheses

Supportive Culture

Culture consists of a collection of fundamental values and belief systems which gives the basis for existence of an organization (Pettigrew, 1979; Schein, 1985; Sackmann, 1991; Hatch, 1993). It exists as a combination of attitudes, values and assumptions (Moran & Volkwein, 1992) and is influenced by both internal and external environment (Alvesson, 1991). There are innumerable studies discussing the importance of culture in organizations (Alvesson & Berg, 1992; Brown, 1995). In fact, it is said that human resource strategies and work environment of an organization are influenced by its culture (Kerr & Slocum, 1987; Kopelman, Brief, & Guzzo, 1990).

When talking about supportive culture, work of Litwin & Stringer (1968) finds relevance. They have established a link between attitudes and behaviours of employees and the work environment of an organization. Out of the nine sub-scales of a 50 item questionnaire developed by them, two sub-scales., ie, 'support' and 'warmth' explain supportive culture. By support, they mean to state that mutual support and help extended by superiors to subordinates and by peers and colleagues have a positive influence on employees. They feel happy and satisfied, and hence, are motivated to perform effectively and be more committed to the organization. Similarly, warmth refers to good interpersonal relationships among employees developing a congenial work environment. Such a warm work environment results into happy, satisfied and stress-free employees and are motivated to work more efficiently and effectively in the organization.

A number of studies (Flowers & Hughes, 1978; Huo & Randall, 1991) have developed several important value dimensions relevant for the organizations. Taking clue from the work of Flowers & Hughes (1978) who have identified comprehensive set of 12 discrete organizational values, one value of 'teamwork' supports our concept of supportive culture. Teamwork implies the culture of working in teams and positive and work teams have a positive influence on its members.

Similarly, Jones & James (1979) identified six dimensions of climate, out of which, leadership facilitation and support, workgroup co-operation, friendliness and warmth, professional and organizational esprit, and mutual trust can be related to supportive culture. These dimensions have a profound influence on motivation and behaviour of employees (Litwin & Stringer, 1968; Bowers, 1976) and on organizational effectiveness (Likert, 1961; Mudrach, 1989). Supportive work culture of team spirit, mutual trust and support, friendliness and warmth, and caring attitude help in developing positive perception and attitudes of employees and relieve them of stress. Employees are motivated to work harder in the organization and improve their performance, indirectly affecting their growth avenues which find support from literature. Friendly, supportive and strong peer cohesion environment is likely to motivate employees to stay in the organization (Hong & Kaur, 2008) Enjoyment and positive emotions in work have subsequently lower intention to quit jobs (Sherman, 1989; Connolly & Viswesvaran, 2000). On the other hand, unsupportive or negative organizational culture may trigger negative reaction among employees and may result into adverse consequences for the organization.

Researches in the past have linked employee job satisfaction with a number of cultural factors like, rewarding employees for good performance, providing growth opportunities, involving employees in decision-making, support of supervisors, etc (Arnold & Spell, 2006; Chang & Lee, 2007; Mckinnon, 2003 and Rad, 2006). Employees in a supportive culture understand the values, norms and requirements of their organizations and perform accordingly. On the other hand, organizations having weak organizational cultures do not have values, systems, norms, structures etc in synchronization with each other and thus might lead to chaos and confusion and dissatisfaction of employees.

With reference to call centres, the interviews with women employees revealed that call centres work in teams. Employees are allocated different teams, headed by a team leader. Team leader gives directions to his or her team members and is entirely responsible for the performance of the team and its members. Building upon the above mentioned literature, it can be inferred that if the team is positive and has good relationships among members and the leader, then it might have positive influence on its members who will be motivated to work more efficiently and effectively in their teams. Moreover, a number of call centres understand the family-related issues of women and thus, have taken initiatives, such as, career break schemes, flexible work arrangements, crèche facilities, etc to motivate and encourage women to stay in the organization and focus on organizational activities (Scholarios & Taylor, 2010). Thus, on the basis of the review of the literature, it can be conjectured that:

H1: Supportive culture is positively related to job satisfaction.

H2: Supportive culture is negatively related to stress.

H3: Supportive culture is positively related to career advancement.

Stress

Lazarus and Folkman (1984, p. 19) define stress as "a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being." Parker and DeCotiis (1983, p. 164) emphasize on "psychological and physiological reactions to uncomfortable or undesirable conditions" as leading to stress. Stress, also refers to the emotional and situational perception of people (Pearlin, 1989). Also, it may be conceptualized as any condition that has an adverse impact on the well-being of the individuals (Crank, 1991). Stress can be stimulated by a large number of factors related to the environment, the organization and the individual (Robbins & Judge, 2007). For instance, the work stress increases due to a) lack of support from seniors and/or subordinates, b) less challenging job, c) prevalence of biasness by giving preferences to male peers d) favouritism, e) lack of recognition / appreciation of a job well done, f) office politics or g) high competition (Shikari, 2010). The climate of the organization also plays a major role in creating job stress (Hemingway & Smith, 1999; Zeffane & McLoughlin, 2006). Employees experience lower stress if they perceive the work environment favourable and vice versa. However, call centres are generally described as stressful and hence, we hypothesize that:

H4: Stress acts as a mediator between supportive culture and job satisfaction.

Career Advancement

Career advancement is an important feature that employees look for in all organizations. Its significance in an organization cannot be underestimated. Various researchers have explained career progression or advancement in different ways but the underlying meaning remains the same. Kaine (2010) defined career progression as a systematic approach which helps in ringing out a match between the goals of employees and the organization. According to him, organization undertakes initiatives for the development of its employees, enabling them to look for future job opportunities who in turn benefit the organization with their dynamism and effectiveness. Such initiatives of the organization tend to enhance job satisfaction of employees. Similarly, Donaldon (2010) was of the view that lack of new challenges, bring job dissatisfaction. He further added that people leave jobs because of lack of career progression in their organizations. Any employee who joins an organization wants advancement in his career and would like to achieve success in his profession (Mayo, 2008). This research is further supported by Lingham (2008) who highlighted the role of career progression in developing and preparing people for taking up

higher responsibilities in the organization. He further stated that career advancement provides a certain level of autonomy to employees which in turn provides a sense of professional satisfaction and security to them. On the other hand, lack of career progression leads to frustration and job dissatisfaction among employees. Thus, on the basis of above literature, we hypothesize that:

H5: Career advancement acts as a mediator between supportive culture and job satisfaction

Mediator Model

According to Baron & Kenny (1986), a variable functions as a mediator when it meets the following conditions:

Condition 1: Independent variable leads to dependent variable

Drawing analogy to our proposed model, supportive culture leads to job satisfaction.

Condition 2: Independent variable leads to mediating variable

In our model, supportive culture leads to stress and career advancement.

Condition 3: Mediating variable leads to dependent variable rendering the previously significant relationship between independent and dependent variables no longer significant

In our model, stress and career advancement lead to job satisfaction rendering the previously significant relationship between supportive culture and job satisfaction as non- significant.

The conceptual model based on Baron & Kenny (1986) model is given as under:

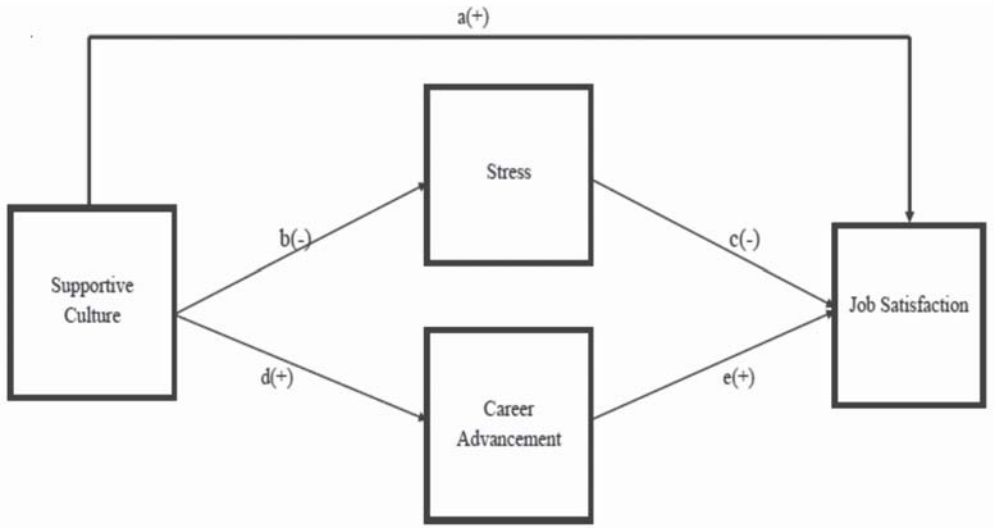


Figure 1: Model of Supportive Culture and Job Satisfaction with Stress and Career Advancement as Mediators (a indicates direct path, b-c and d-e indicate mediated paths)

Methodology

Participants

A total of 302 employees from 8 different call centres participated in the study. The participants of the study were female executives serving both international and domestic clients. International clients included clients from US, UK and Australia. For data collection, human resource managers of the call centres were contacted. Only two managers gave a positive response and agreed to conduct survey in their organizations. 117 data was collected through these two call centres. The rest of the data was collected through snowball sampling method, wherein contacts were used to identify respondents. Nearly 400 questionnaires were distributed through acquaintances/ contacts out of which 261 were returned, and 179 were found fit for analysis. Six questionnaires (fit for analysis) were obtained from the online portal surveymonkey.com.

The age of the respondents varied from 18 years to 53 years. The mean age of the respondents was 21.7 years. The educational qualification ranged from graduation to technical, professional and post-graduation. 299 respondents reported their qualification and the most of the respondents (47.8 %) were post graduates. Most of the employees were in the lower levels as is evident from their reported work experiences. Demographic data shows that 72.2 percent of women had 0-3 years of experience. 301 respondents reported their marital status and majority of the respondents (77.4%) were unmarried. Majority of the respondents (75.6%) lived in a nuclear family.

Scales Used

A brief description of the scales used is as given below:

Supportive Culture

The scale for supportive culture was developed by adapting items from the questionnaire used by NASSCOM-IIM (A) study (2009) on 'Crossing the Digital Barriers'. The scale consisted of five items with one item as reverse coded item. The sample items are: my organization has a frank and open environment, all employees work with a team spirit in my organization, etc. The items were rated on a five point rating scale (1= strongly disagree to 5 = strongly agree.

Stress

Stress was measured with four burnout and anxiety related items (eg. I feel emotionally drained by my job, I feel tense at my job) adapted from the scale developed by Tate, Whatley, & Clugston (1997). Participants indicated on a six-point scale the degree to which they experienced each of these symptoms.

Career Advancement

The scale for career advancement was developed for this study consisting of four items. One, out of four items was reverse coded. The construct validity was established by taking the views of a group of people. Five point rating scale was used to rate the items (1 = strongly disagree and 5 = strongly agree). A sample item is "I have got substantial growth in my career during my stay in this organization."

Job Satisfaction

Job Satisfaction was assessed through a six item scale developed by Brayfield and Rothe (1951). Out of the six items, three items were reverse coded. The respondents were asked to rate the items on a five point scale (1 = strongly disagree to 5 = strongly agree). A sample item is "I feel fairly well satisfied with my job".

Analysis and Result

Multiple regression analysis was conducted to test hypotheses. Using the enter method, a significant model emerged: F = 7.883, p < 0.001(condition 1 in both tables 3 and 4). Thus, results offer support for hypotheses H1. Supportive culture is found significantly related to stress (â = -0.260, p < 0.001) (table 3), thus offering support to H2. Similarly, there is a significant relationship between supportive culture and career advancement (â = 0.453, p < 0.001) (table 4). Hence, our third hypothesis (H3) is also accepted.

We used regression based mediation analysis (Baron & Kenny, 1986) to test hypothesis 4 and hypothesis 5. Hypothesis 4 suggests that stress mediates the relationship between supportive culture and job satisfaction. A significant model emerged (F = 25.784, p<0.001) depicted in table 3 (condition 3). Stress was found to be significantly related to job satisfaction (â = -0.450, p<0.001) rendering partial mediation between supportive culture and job satisfaction (â = 0.143, p = 0.007). Thus, the results partially support H4. In all the cases, age and marital status had no relationship with job satisfaction. The partially mediated values are shown in table 3.0.

Table 3.0: Partial Mediation between Supportive Culture and Job Satisfaction (Stress as a mediator)

Baron & Kenny's (1986) conditions	Variables	Beta values	F Change	R^2	P value
Condition 1	Age	0.077			0.277
	Marital Status	0.059			0.105
	SC	0.260	7.883	0.075	0.000
Condition 2	Age	0.094			0.182
	Marital Status	-0.090			0.204
	SC	-0.260	8.365	0.080	0.000
Condition 3	Age	-0.034			0.588
	Marital Status	0.018			0.772
	ST	-0.451	25.784	0.263	0.000
	SC	0.143			0.007

Note: *Independent Variable: Supportive Culture (SC), Dependent Variable: Job Satisfaction (JS), Mediating Variable: Stress (ST)*

The table 4.0 below shows the partially mediated relationship between supportive culture and job satisfaction (β = 0.141, p < 0.05) by career advancement. This implies that results partially support H5. However, before partial mediation, the relationships between supportive culture and job satisfaction (β = 0.260, p < 0.001) and between supportive culture and career advancement (β = 0.263, p < 0.001) are significant. None of the control variable is found to be significant to job satisfaction.

Table 4.0: Partial Mediation between Supportive Culture and Job Satisfaction (Career Advancement as a mediator)

Baron & Kenny's (1986) conditions	Variables	Beta values	F Change	R^2	p value
Condition 1	Age	-0.077			0.277
		0.059			0.405
	Marital Status	0.260	7.883	0.075	0.000
	SC				
Condition 2	Age	0.041			0.565
	Marital Status	0.045			0.528
	SC	0.263	7.853	0.075	0.000
Condition 3	Age	-0.095			0.132
	Marital Status	0.039			0.540
	CA	0.453	26.100	0.265	0.000
	SC	0.141			0.008

Note:*Independent Variable: Supportive Culture (SC), Dependent Variable: Job Satisfaction (JS), Mediating Variable: Career Advancement (CA)*

Discussions

The study partially supports our research model which shows stress and career advancement as mediating variables between supportive culture and job satisfaction. Our findings suggest several conclusions. Firstly, supportive culture is positively related to job satisfaction. Supportive culture comprises of interpersonal relationships between employees and the warmth and support extended by employees to each other (Litwin & Stringer, 1968). All these have profound effect on the attitude and reactions of employees towards their organizations. If the culture and climate of the organization are favourable to the employees, they will be happy and satisfied in the organization and if the same is adverse to them, they may develop negative attitude towards the organization. Similarly, if the value system of an organization matches with the values of an individual, he/she feels satisfied and may result in positive work outcomes. Secondly, there is a strong negative relationship between supportive culture and stress. An organizational culture where superiors take care of their subordinates and there is mutual trust and support between employees, is positively accepted by employees and motivates them to develop positive attitude towards the organization. Employees are more likely to stay in the organizations, if they are working in a perceived friendly, supportive and strong peer cohesion environment (Hong & Kaur, 2008). Such a supportive work environment is likely to reduce stress levels and provide satisfaction to employees and when employees are satisfied, they are likely to concentrate on their performance in the organization, which might result into growth of their careers providing support to our third finding where supportive culture is positively related to career advancement.

Other significant results that emerge out of the study are partial mediation between supportive culture and job satisfaction by stress and career advancement. Results clearly indicate the strong significance of supportive culture in call centres for women employees. There is a perception that women in call centres feel stressed, as the call centre work is stressful (Mitter, Fernandez, & Varghese, 2004; Sharma, 2005). But, our results indicate that stressful environment

of call centres only partially mitigates the strong relationship between supportive culture and job satisfaction. Similarly, career advancement also only partially mediates the relationship between supportive culture and job satisfaction which otherwise is considered a strong mediator. This implies that in a call centre women consider supportive culture more important and seem to have a more profound impact on job satisfaction.

Conclusion

The study contributes significantly to the literature of call centres by developing theory about how supportive culture has a strong relationship with job satisfaction and stress and career advancement only partially mediate their relationship. This clearly indicates that women in call centres feel that even career growth cannot provide that much job satisfaction to them, as the supportive culture can give. Similarly, stress caused by other factors cannot shake the relationship between supportive culture and job satisfaction. This implies that the culture of an organization which is favourable to its employees plays an important role in determining their satisfaction and can be utilized in bringing about transformation in the organization. Zairi (1997) very rightly stated that having good structures and systems only will not help organizations to achieve effectiveness and efficiency, rather they should focus on their cultural aspects.

Limitations and Scope for Future Research

The entire sample was drawn from Indian call centres located in Delhi and NCR. Therefore, the findings can be most reliably attributed to employees from ITES sector only. Future researchers are advised to include a larger, and geographically diverse sample to improve generalizability (external validity) of our findings.

Next, the conclusions of the study are based solely on self reported data, collected at one point in time, causing common method variance which can be reduced in future researches by using a variety of tools.

Finally, in the study supportive culture is taken with reference to the relationship with the boss or the supervisor and open and frank environment whereas researches have taken supportive culture as consisting of many dimensions. Future studies might take up supportive culture including all dimensions and then study the impact of each dimension on job satisfaction.

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Exploring the Relationship between Ethics and Knowledge Management: A Conceptual Framework for Successful Organizations

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Abstract

This study attempts to identify the ethical concerns inherent in an organization which impacts Knowledge Management (KM). The main objective of the study is to examine the impact of various ethical constructs on KM deliberating on various KM levels, knowledge ownership, KM model and KM practices.Relevant literature has been reviewed by online database search including ProQuest Central, Emerald, SAGE, Business source complete (EBSCO).

The study notes that ethics provides the organization with guiding principles for KM and facilitate effective implementation and execution of KM practices for betterment of employees, organizations and society. The successful organizations are those which create and manage new knowledge where ethics plays a key role. The study suggests a conceptual framework linking ethics and KM.This study offers various dimensions for potential research on numerous constructs of ethics and KM discussed in study. The study also provide platform for future researchers to carry empirical researches and also for developing conceptual model or framework on ethics and KM.

The study suggests a conceptual framework subject to empirical validation. Also, there is a dearth of literature studying the linkage between ethics and KM.The study offers a conceptual approach deliberating the ethical perspective highlighting various ethical constructs impacting KM.

Keywords: Ethics, Knowledge Management, Tacit Knowledge, Explicit Knowledge, Intellectual Capital.

Introduction

In this era, the intellectual capital is the key to success for any organization. The success is conquered by those organizations that create, manage and apply knowledge in their organizational processes, products and services. The competition is severe in this dynamic environment where competitors keep changing their products, services and strategies rapidly. Thus organizations will win when they improve their existing knowledge and create new knowledge. Today, the success of an organization is dependent on its ability to create or acquire new knowledge and application of that knowledge for continuous development of organizational activities.

The organizations use novel, creative and innovative techniques to improve their structure and enhance their performance **(Michael et al., 2009)**. In this endeavor to become successful, these organizations overlook the ethical issues. With globalization, a change in technology, lifestyles and job styles, there is need to address ethical issues as well. Along with technological

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advancements, world is also encountering compromise on the ethical practices like knowledge hoarding, manipulation and misappropriation. There are various socio economical, technological and legalistic issues which violate ethical practices to be followed. The ethics provides the organization with guiding principles for KM and facilitate effective implementation and execution of KM practices resulting in a win-win situation for all the stakeholders. The aim of this study is to develop a conceptual framework linking ethics and KM.

The study is organized as follows: initial section starts with the introduction followed with the literature review on ethics and KM. The next section discusses research methodology and proposed conceptual framework. Then the study concludes with research limitations and avenues for future investigation.

Literature Review

Ethics

Ethics can be referred as behavioral codes which are considered as right and good by individuals at micro level and society at macro level. Proximal and distal roots of ethics lie in teleology (Hume, 1750; Smith, 1759) and deontology (Kant, 1785). Teleological approach reflects that consequence of an action is indicator of good or bad whereas deontology reflects that action should itself be an ethical indicator. The other approach to ethics is Aristotle's Nicomachean Ethics (350BC), according to which it is an individual's behavior which should be ethical and not a result of an action or action itself which reflect ethics. Ethical understanding of a community is dependent on value system embedded in that particular community (MacIntyre, 1985). Ethics is not only a philosophical abstract theory but it also provides a guideline for individual practice as well as collective practice in community (Tseng and Fan, 2011). Individuals as member of a organization and a community are guided to respect ethical norms laid down by organization and society (Tseng and Fan, 2011). Ethics are not created directly by humankind rather ethics are resulted from human nature. The ethics represents ideals embedded in a group or community of people (Peyman Akhavan, 2013). Ethics are referred to good and bad attributes, conducts, intentions or moral duties and commitments towards organization or society, Ethics is a branch of philosophy analyzed as norm based science and it encompasses guiding norms of human behavior and thus it can be distinguished from mathematics or natural sciences (Holden, 2000). Business ethics is referred to as a branch that emphasizes on improvement in moral quality of decision making. Business ethics is largely diverse in terms of attitudes and approaches (Martz and Morgan, 2007).

Victor and Cullen (1964) proposed the concept of organizational ethical climate which focused on one of the important element of work climate. Organizational ethical climate constitutes shared beliefs and values of organizational members which is reflected in their behavior a (Smirich, 1983; Schneider, 2006). Organizational ethical climate reflects people's ethical judgments, intentions and their behavior in determination of right or wrong action at work. Victor and Cullen's model of organizational ethical climate comprises of nine different types of ethical climate including self interest, company profit, efficiency, friendship, team interest, social responsibility, personal morality, company rules and professional codes. These nine ethical climates recognize organizational ethical norms which in turn supports ethical behavior in organization. These nine-ethical climates have stronger relationship with individual ethical behavior (Peterson, 2002).

Peyman Akhavan (2013) identified four dimensions of ethical principles constituting organizational value and justice, commitment and responsibility, Intellectual ownership and trusteeship and team working morale. Organizational values and justice is the most vital aspect of ethical principles constituting collective trust and organizational trust; fair, honest and humble behavior

of employees; criticism taking and perseverance in works. Other ethical dimension includes responsibility, commitment and loyalty towards organization. It also includes working conscience and being foresighted at work. Intellectual ownership and trusteeship refers to obeying intellectual property rights, maintaining confidentiality and trusteeship. Team working morale refers to ethical conduct while working in a team which involves cooperation, empathy, self-awareness, self-control, affability and council with others.

There are other models of ethics. PRIMES model by Chuck Huff (2010) is a significant model which includes personality, integration of morality, moral ecology and skills. Personality impacts work that people undertake and the way they go about their work (John and Srivastava,1999). Personality is dynamic in nature as it keeps on changing with life experiences. Integration of morality depicts moral commitment which guides action over time. Moral actions are strongly influenced and dominated by surrounding environment which is referred to as moral ecology. Moral skills and knowledge is knowing how about moral actions.

Knowledge Management

KM according to Wig (2002) is referred to as process of identifying the knowledge from internal as well as external environment and utilizing them for decision making in the organization. According to Haines (2001), KM constitutes four components: content, skill, culture and organization. Content refers to explicit or implicit knowledge, skills are abilities to extract that knowledge, culture is environmental framework which encourages knowledge sharing and organization refers to organizing available knowledge. KM is referred as process as well as an objective (Crawford, 2005). KM is also referred to as knowledge conversion, as knowledge is transformed from one form to other. Knowledge conversion takes place through knowledge transformation cycle where tacit and explicit knowledge are transformed into each other. Tacit knowledge refers to personal knowledge which is there in form of experience, idea, know-how of doing a thing in unique manner and has intangible identity as it can't be codified. Explicit knowledge is a form of knowledge which is easy to acquire and transfer, also easy to express both verbally and non-verbally (Yang, 2007). Nonaka and Takeuchi (1996) gave a model on knowledge transformation which is mutual conversion process of tacit and explicit knowledge. Nonaka and Takeuchi model is a four-dimensional model known as SECI model includes socialization, externalization, combination and internalization.

The four dimensions of SECI model can be defined as:

1. Socialization: conversion of tacit knowledge into a new tacit knowledge.
2. Externalization: conversion of tacit knowledge into new explicit knowledge.
3. Combination: conversion of explicit knowledge into new explicit knowledge.
4. Internalization: conversion of explicit knowledge into new tacit knowledge.

The originator of knowledge is an individual employee and knowledge resides in minds of individuals (Polanyi, 1998). Individual's knowledge is the source of their economic mean which leads to reservation of an employee in sharing the knowledge (Michallova and Husted, 2003). Knowledge processing behavior of any individual is determined by their attitude which totally depends of the recognition, appreciation and reward an employee receives. On the other hand, organization provides a platform to its employees for knowledge creation, acquisition, also resources, infrastructure and a reward system for knowledge creation.

Organizational success relies on ability of an organization to acquire, create and apply that knowledge. KM is the process which helps an organization to be successful. There are various

Table 1: Ethics dimensions and respective indicators

S. No.	Dimensions	Indicators/Areas	Sources
1.	SECI model of KM	A. Socialization	Peyman Akhavan et al. (2013), Nonaka and Takeuchi (1996)
		B. Externalization	
		C. Combination	
		D. Internalization	
2.	Levels of KM	A. Personal KM	Goncalo Jorge Morais da Costa et al. (2010)
		B. Organizational KM	
3.	Knowledge ownership	A. Organizational ownership	Isabel Rechberg and Jawad Syed (2013)
		B. Individual ownership	
		C.	
4	KM PRACTICES		
4.1	KM Practice 1: Management leadership and support	A. Top management as role model	Skyrme and Amidon (1997),Davenport et al. (1998), Liebowitz (1999), Holsapple and Joshi(2000), Hassanali (2002), Ribiere and Sitar (2003), Wong andAspinwall (2005),Al-Busaidi and Olfman (2005),Chong (2006), Akhavan and Jafari(2006), Akhavan et al. (2006), Jafari et al. (2007), du Plessis(2007), Foot and Hook (2008), Foss and Minbaeva (2009), Zacket al. (2009), Prieto-Pastor et al. (2010), Foss et al. (2010), Kianto(2011), Andreeva and Kianto (2012), Frost (2014) and Zeinalnezhad et al. (2014), Sinha et al. (2015)
		B. Top management encouragement	
		C. Leadership style	
		D. Levels of hierarchy	
		E. Top management commitment	
4.2	KM Practice 2: Culture	A. Vision	Skyme and Amidon(1997), Davenport et al. (1998),Liebowitz (1999),APQC (1999), MeDermott and O'Dell(2001), Stankosky(2001) , Hassanali (2002), Wieneke and Phylpo-Price (2003), Wong and Aspinwall (2005), Al-Busaidi and Olfman (2005),Hung et al.(2005), Akhaavan et al. (2006), Chong(2006), Bozbura(2007), Du Plessis (2007), Foot and Hook (2008), Foss and Minbaeva (2009), Zack et al. (2009), Prieto- Pastor et al. (2010), Foss et al. (2010), Xu et al.(2010), Kianto (2011), Andreeva and Kianto (2012), Appelbaum et al.(2014) and Frost (2014), Sinha et al. (2015)
		B. Level of trust	
		C. Knowledge sharing culture	
		D. Experienced employees sharing knowledge	
		E. Teamwork	
		F. Open communication	
		G. Flexibility and adaptability	
		A. Openness	
		B. Values	
		C. Knowledge sharing culture	
		D. User satisfaction and retention	

Source: Compiled by authors

factors which influence KM implementation. These factors are known as KM practices (Sinha et.al, 2015). One of the most important KM practice is culture which represents company values and a necessary ecosystem for other KM activities (Sinha et.al, 2015). KM objectives can be initiated and accomplished if there is a support system from top management (Zeinalnezhad et al., 2014). KM initiative can be a success only when supported by processes and activities (Boyle, 2010). Strategy provides roadmap to pursue KM objectives. To implement KM, organization requires technology, knowledge repositories and expert databases (Leon, 2009). Organizational infrastructure also plays an important role in KM implementation which implies establishing teams to perform knowledge-related tasks. The accomplishment of KM objectives is dependent on resource availability and its allocation (Zheng et al., 2013). Training and development of an employee plays a vital role in successful implementation of KM. To ascertain the effectiveness of KM, there should be assessment through financial and non-financial measurement. The various other KM practices are human resource management, motivational aids, benchmarking, networking and alliance and employee involvement and empowerment (Sinha et al., 2015).

The KM dimensions identified from the literature are listed in below:

Table 2: KM dimensions and respective indicators

S. No.	Dimensions	Indicators/Areas	Sources
1.	**SECI model of KM**	A. Socialization	Peyman Akhavan et al. (2013), Nonaka and Takeuchi (1996)
		B. Externalization	
		C. Combination	
		D. Internalization	
2.	**Levels of KM**	A. Personal KM	Goncalo Jorge Morais da Costa et al. (2010)
		B. Organizational KM	
3.	**Knowledge ownership**	A. Organizational ownership	Isabel Rechberg and Jawad Syed (2013)
		B. Individual ownership	
		C.	
4	**KM PRACTICES**		
4.1	**KM Practice 1: Management leadership and support**	A. Top management as role model	Skyrme and Amidon (1997),Davenport et al. (1998), Liebowitz (1999), Holsapple and Joshi(2000), Hassanali (2002), Ribiere and Sitar (2003), Wong andAspinwall (2005),Al-Busaidi and Olfman (2005),Chong (2006), Akhavan and Jafari(2006), Akhavan et al. (2006), Jafari et al. (2007), du Plessis(2007), Foot and Hook (2008), Foss and Minbaeva (2009), Zacket al. (2009), Prieto-Pastor et al. (2010), Foss et al. (2010), Kianto(2011), Andreeva and Kianto (2012), Frost (2014) and Zeinalnezhad et al. (2014), Sinha et al. (2015)
		B. Top management encouragement	
		C. Leadership style	
		D. Levels of hierarchy	
		E. Top management commitment	

4.2	**KM Practice 2: Culture**	A. Vision B. Level of trust C. Knowledge sharing culture D. Experienced employees sharing knowledge E. Teamwork F. Open communication G. Flexibility and adaptability A. Openness B. Values C. Knowledge sharing culture D. User satisfaction and retention	Skyme and Amidon(1997), Davenport et al. (1998),Liebowitz (1999),APQC (1999), MeDermott and O'Dell(2001), Stankosky(2001) , Hassanali (2002), Wieneke and Phylpo-Price (2003), Wong and Aspinwall (2005), Al-Busaidi and Olfman (2005),Hung et al.(2005), Akhaavan et al. (2006), Chong(2006), Bozbura(2007), Du Plessis (2007), Foot and Hook (2008), Foss and Minbaeva (2009), Zack et al. (2009), Prieto- Pastor et al. (2010), Foss et al. (2010), Xu et al.(2010), Kianto (2011), Andreeva and Kianto (2012), Appelbaum et al.(2014) and Frost (2014), Sinha et al. (2015)
4.3	**KM Practice 3: Information technology**	A. KM systems B. Technological tools C. Collaborative tools D. Repositories E. Capturing explicit knowledge F. Managing information overload G. Simplification of knowledge infrastructure H. Knowledge bases I. Platform independence	Skyrme and Amidon(1997), Davenport et al.(1998), APQC(1999), Alavi and Leidner(2001), Al-Busaidi and Olfman(2005), Wong and Aspinwall(2005), Hung et al. (2005), Akhavan et al (2006), Akhavan and Jafari (2006), Chong (2006), du Plessis(2007), Zaim et al.(2007), Leon (2009), Xu et al(2010) , Kianto (2011), Andreeva and Kianto (2012), Filstad(2014) and Sinha et al. (2015)
4.4	**KM Practice 4: Strategy and purpose**	A. Objectives and goals for KM B. Explicit documentation of KM rules C. Written KM policy D. Alignment of KM strategy with business strategy E. Supporting business goals	Skyrme and Amidon (1997),Davenport et al. (1998),Liebowitz(1999), APQC (1999),Zack (1999), OECD (2003),Wongand Aspinwall (2005), Akhavanet al. (2006), Bozbura (2007),du Plessis (2007), Zack et al.(2009), Xu et al. (2010) andAndreeva and Kianto (2011),Sinha et al. (2015)
4.5	**KM Practice 5: Measurement**	A. Financial measures B. Non-financial measures C. Value of intellectual capital D. Assessment of return on investment E. Performance indicators F. Knowledge related success criteria	Davenport et al. (1998), APQC (1999), Holsapple and Joshi (2000), Hassanali (2002), Wienekeand Phlypo-Price (2003), Wong and Aspinwall (2005), Hung et al. (2005), Chong (2006), du Plessis (2007), Zaim et al. (2007), Zacket al. (2009), Mitchell and Boyle (2010) and Andreeva and Kianto(2012),Sinha et al. (2015)

4.6	**KM Practice 6: Organizational infrastructure**	A. Infrastructure for KM	Davenport et al. (1998), Liebowitz (1999), Hassanali (2002), Al-Busaidi and Olfman (2005), Wong and Aspinwall (2005), Akhavan and Jafari (2006),Akhavan et al. (2006), Jafari et al. (2007), du Plessis (2007),Xu et al. (2010) and Andreeva and Kianto (2011),Sinha et al. (2015)
4.7	**KM Practice 7: Process and activities**	A. Process for knowledge capture B. Classification and sharing C. Knowledge sharing policies and activities D. Methods and standards for knowledge creation	Skyrme and Amidon (1997), Davenport et al. (1998), Holsapple and Joshi (2000), Bhatt (2000), Stankosky (2001), McElroy (2003), Wong and Aspinwall (2005), Akhavan and Jafari (2006), Foot and Hook (2008), Foss and Michailova (2009), Foss et al. (2010), Xu et al. (2010) and Mitchell and Boyle (2010), Sinha et al. (2015)
4.8	**KM Practice 8: Motivational aids**	A. Incentives for KM B. Reward systems C. Recognition for contributions to KM D. Assessing KM initiatives for performance appraisal E. Motivational aids for KM	Davenport et al. (1998), Liebowitz (1999), Yahya and Goh (2002), Al-Busaidi and Olfman (2005), Wong and Aspinwall (2005), Akhavan and Jafari (2006), du Plessis (2007) and Prieto-Pastor et al. (2010),Sinha et al. (2015)
4.9	**KM Practice 9: Resources**	A. Financial resources for KM B. Non-financial resources for KM C. Providing sufficient time for KM	Mentzas (2001), Yahya and Goh (2002), Wong and Aspinwall (2005), Hung et al. (2005), Akhavan et al. (2006), Chong (2006), Akhavan and Jafari (2006), Bozbura (2007), Jafari et al. (2007), du Plessis (2007), Zacket al. (2009), Xu et al. (2010), Andreeva and Kianto (2012) and Zheng et al. (2013),Sinha et al. (2015)
4.10	**KM Practice 10: Training and Education**	A. Awareness programs	Davenport et al. (1998); Holsappleand Joshi (2000), McDermott and O'Dell (2001), OECD (2003), Wong and Aspinwall (2005), Chong (2006), Bozbura (2007), Kianto (2011) and Palethorpe (2014),Sinha et al. (2015)

4.11	KM Practice 11: Human resource management	A. Human resource practices for KM	Yahya and Goh (2002), Wienekeand Phlypo-Price (2003), Wong and Aspinwall (2005), Foot and Hook (2008), Foss and Minbaeva (2009), Prieto-Pastor et al. (2010), Zheng et al. (2013) and Palethorpe (2014),Sinha et al. (2015)
		B. Human development practices	
		C. Recruitment for KM initiatives	
		D. Selection methods	
		E. Staffing	
		F. Remuneration	
4.12	KM Practice 12: Benchmarking	A. Benchmarking within same industry	Drew (1997), O'Dell and Grayson (1998), Moffet et al. (2003), Hung et al. (2005), Chong (2006), Akhavan and Jafari (2006), Xu et al. (2010), Andreeva and Kianto (2011) and Zeinalnezhadet al. (2014), Sinha et al. (2015)
		B. Benchmarking outside the industry	
		C. Adoption of best practices	
4.13	KM Practice 13: Networking and alliance	A. Knowledge acquisition outside the organization	OECD (2003), Community Innovation Survey IV (2005), Bozbura (2007), Xu et al (2010), Andreeva and Kianto (2012), Zheng et al. (2013), Palethorpe(2014), Filstad(2014) and Sinha et al. (2015)
		B. Internal networks for KM	
		C. Membership of industrial bodies	
		D. Customer feedback	
		E. Partnership and collaboration with vendors	
4.14	KM Practice 14: Employee involvement, training and empowerment	A. Autonomy	O'Brien and Crauise (1995), Ward (1997), Martinez (1998), Ulrich (1998), Verespej (1999), McCune (1999), Wilson and Asay (1999), Ryan and Prybutok (2001), Moffettet al. (2003), Zack et al. (2009), Kianto (2011) and Appelbaum et al. (2014),Sinha et al. (2015)
		B. Promotion of experimentation	
		C. Involvement in decision making (KM)	
		D. Control over the pace of work	
		E. Empowering knowledge workers	

Source: Compiled by authors

Ethics and Knowledge Management

It is necessary to have ethics in KM as KM practices might be unfair and unjust because focus of an organization is on profits and not on individuals (Glisby and Holden, 2003). Individuals as a member of organization, is guided to follow ethical conduct. In KM, knowledge ownership is managed and regulated by organization and knowledge process engagement is also encouraged. Ethical approach to KM is built on trust, fairness and justice as they stimulate individuals to participate in KM process. Trust prevents employees from knowledge hoarding (Delong and Fahey, 2000). Trust facilitates sharing and creation of knowledge (Burchell and Cook, 2008). Trustworthiness among individuals in a group impacts the extent to which knowledge is shared. Where there is trust in an organization, individual can depend on organization to care for them. Trust enables colleagues and managers to freely share knowledge instead of hiding or

protecting that knowledge. Patel and Ragsdell (2011) quoted the need for a fair and ethical behavior. Tseng and Fan (2011) highlighted the importance of an ethical organizational climate for facilitating knowledge processes. The ethical approach to KM supports an organization to engage individuals in knowledge process and also to build database acquiring and retaining individual knowledge and experience (Liebowitz, 1999). Fair KM practices rewards individuals for their knowledge contributions (Bakerville and Dulipovici, 2006). According to Sen (1993), firms that treat its employees well are richly rewarded for it. Organizations rewarding individuals with incentives for knowledge contribution encourages fairness (Bock et al., 2005). Knowledge processing behavior can be motivational when it leads to recognition, promotion, and salary hike and also increases their expertise and knowledge base (Wang and Noe, 2010). Also, KM practices need to be just. The knowledge which individual possesses is an intellectual capital of the individual and organizations may refrain from trying to control it (Chen and Choi, 2005; Gorman, 2004). According to Da Costa et al. (2010) just atmosphere is where individuals feel driven to share, create and process knowledge.

The ethical issues pertaining to implementation of KM system indulge socio economic aspect, technical aspect and legalistic aspect. The socio economic issue from the perspective of KM system implementation carries a hidden agenda. The underlying motivation to implement KM system is to capture the knowledge of the employees to carry out retrenchment in the organization (Bryant, 2006). Technical people involved in designing and implementing of KM system can act as a whistleblower and can make management aware about the involved unethical aspects. Legalistic aspect is a concerned area which emphasizes on the determination of knowledge with ownership right of individual or organization (Baskerville and Dulpovici, 2006).

The various unethical practices in KM comprises of knowledge hoarding, manipulation, misappropriation, property and privacy right conflict, and autonomy in knowledge sharing. Knowledge specifically tacit knowledge is personal in nature and it is not evenly distributed in the organization. Knowledge sharing is dependent on owner's willingness to share with the organization. When employee avoids knowledge sharing with organization, it results in knowledge hoarding. The knowledge is sometimes suppressed, amplified, deleted and omitted to serve some personal interests and sometimes driven by emotion leading to manipulation and misappropriation of knowledge. In knowledge based view of the organization, each organization is the integration of individual employee's knowledge and its application to achieve organizational objective. This view lacks in defining ownership right over knowledge of individual employee and organization.

Research Methodology

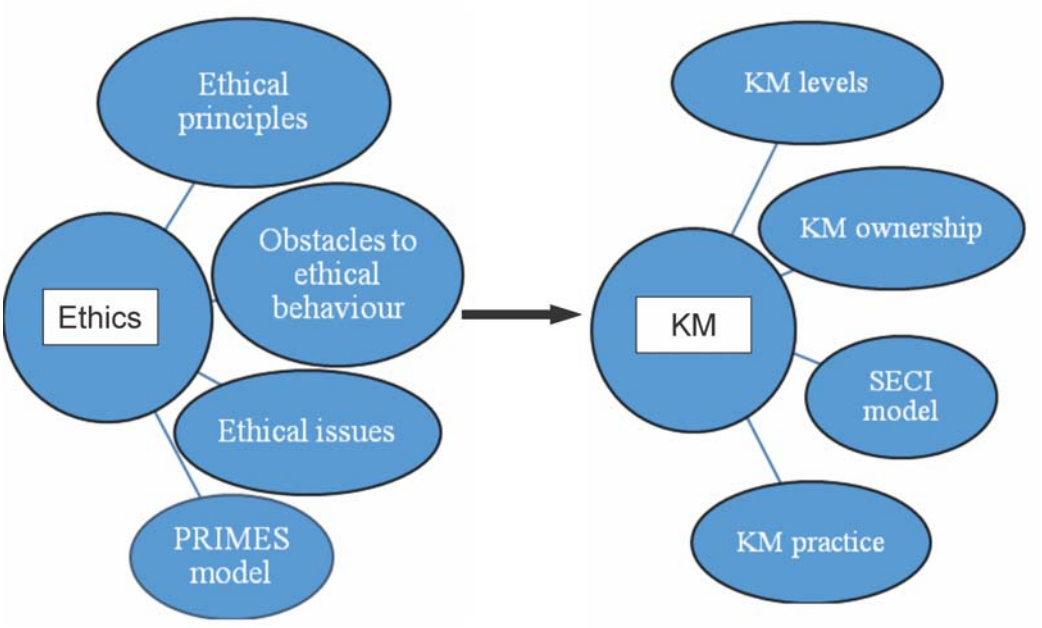
To examine the relationship between ethics and KM, required data is gathered from literature. This study has performed detailed analysis of literature and articles to develop a deeper understanding of the concepts. Data for this research was gathered in till June 2017 through series of searches through extant literature. Research papers concerning KM and ethics were accessed utilizing social sciences databases. The databases used for research are: ProQuest Central, Emerald, SAGE, Business source complete (EBSCO).

The searches were conducted using these key words: knowledge management, ethics, knowledge management and ethics, knowledge management ethics, knowledge management practices, knowledge and ethics, knowledge sharing and ethics, knowledge creation and ethics, and knowledge practices and ethics. These searches were repeated using above mentioned search strings in these databases. A systematic literature review was carried and a selection criterion for papers was well specified (ethical perspective in KM). The research papers selected for the study used the term: knowledge management and/or ethics in their title. Moreover, references

of all research papers selected were scanned to identify relevant research on topic. All research papers were analyzed from the perspective of the theme of the study. This is followed by the abstract scanning of all the papers. If the abstract didn't match the theme of the study, they were excluded for further study. This has led to 219 papers. Next step was detailed examination of papers. After the thorough examination, 56 papers were finalized and were further analyzed and summarized. After conducting this process, various KM and ethics dimensions were identified. The detailed scanning, analysis and research resulted in 17 dimensions of KM and eight major dimensions of ethics. Further various indicators for each dimension of ethics and KM were identified (refer table 1 and table 2).

Conceptual Framework

Ethics in today's world provides the organization with guiding principles of KM and facilitates effective implementation and execution of KM practices for the success of employees, organizations and economies. Victor and Cullen model (1964) of ethics did not include many aspects to form a complete ethical framework like ethical issues from socio economic aspect, technical and legalistic aspect. PRIMES Model by Chuck Huff (2010) also ignored many important aspects relevant to KMS of an organization. Similarly dimensions of ethical principles mentioned by Peyman Akhavan (2013) lacked in many aspects relevant to KM in any organization. These models lack in mentioning obstacles in ethical behavior for KM. This study focuses on developing a conceptual framework linking ethics and KM. The study is an attempt to identify the various ethical and KM dimensions keeping their linkage in mind which has not been explored earlier. The suggested framework depicts the impact of ethics(independent variable) on KM. We present the abstract view of research model in figure 1, reflecting determinants of ethics impacting different determinants of KM. According to the suggested framework in figure 2, there are various determinants and indicators of ethics which are required by an organization for successful implementation of KM process, KM levels, KM ownership and various KM strategies. **Abstract view: Knowledge Management dependence on Ethics**



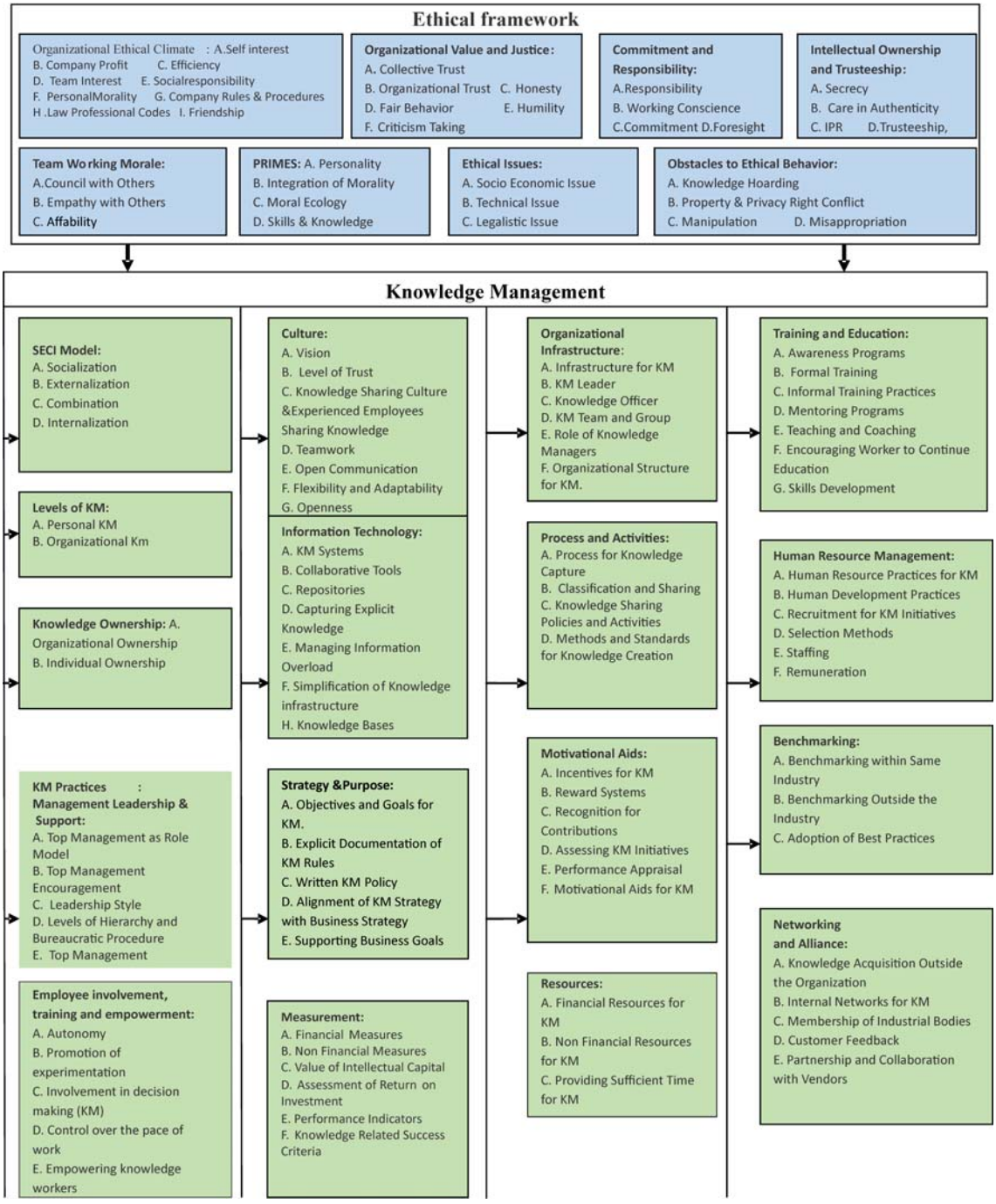


Figure 2: Source: Compiled by authors

Conclusion

The main aim of the study is to examine the impact of ethics on KM. Ethics appears as a relatively new area in KM. Thus, the authors have tried to encapsulate various ethical parameters in KM. The various ethical parameters are organizational ethical climate, organizational values and justice, commitment and responsibility, intellectual ownership and trusteeship, team working moral, ethical issues, PRIMES and obstacles to ethical behavior.

This study has tried to fill up the gap of lack of literature in linking ethics and KM. The authors have realized that literature supports the need of ethics in KM but a comprehensive framework linking the two concepts has never been discussed. The study focuses on ethical issues specifically from KM perspective. There are also deliberations on various obstacles to ethical behavior in KM. These issues span complex areas like knowledge hoarding, manipulation, misappropriation and privacy rights. The socio economic, legal and technical issues have also been discussed. The management of knowledge can be effective in an organization if individual's personality, his surrounding, commitment towards morality and moral skills are studied in depth. The authors support the ideology of moral and ethical actions while implementing KM. When all these parameters of ethics are embedded in the fabric of an organization, it supports KM processes, KM practices and synergizes individual and organizational knowledge. The KM system that supports ethical action is a new application area, which results in organizational success. The moral or ethical action is not a general thing person does while doing other tasks. Moral action is inherited in a way that how someone goes about work, the path chosen, the objectives to be achieved and skills possessed. Thus an ethical KM system is required in which KM system incorporates various ethical aspects.

Research Implications and Future Study

Establishing and implementing a link between ethics and KM may result in ethical conceptualization of KM. Individuals in an organization play a vital role in designing and implementation of KM. This should be integrated in theory and practice of KM. For practical implications, managers should understand that adoption of KM processes will not guarantee success until supported by the ethical framework. Managers should focus on implementing ethical norms and assessing their impact on the KM initiatives including creating, acquiring and sharing knowledge with shared values and beliefs. The conceptual framework presented in the study can be further tested empirically.

Moreover, many other conceptual models can be designed and developed on the various dimensions and indicators of KM and ethics discussed in the study. In future, studies assessing the impact of each ethical dimension in KM processes can be interesting area for research. On the basis of identified themes, a number of potential research questions can be done in future. This study provides a basis for development of new conceptual as well as empirical studies for researchers. The research findings will provide individuals and organizations a better understanding of the linkage. KM systems can be implemented and executed more successfully in those organizations where there is more emphasis on ethics by the organizations.

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Revolutionizing Indian Higher Education through Knowledge Management and Information and Communications Technology: A Conceptual Model

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Abstract

The progress of a nation largely depends on its education system, which in turn has the potential to do justice if it can make available the right knowledge at the right time so as to enable one to take the right decision.

The above statement calls for an appropriate Knowledge Management (KM) technique in education system. As far as Indian universities are concerned, none of them featured in the year 2018 top 200 list of World University Rankings prepared by the Times higher education group. Surprisingly there are only 30 Indian institutes in the global 1000, which is one less than last year's (Nanda PK, 2017). This dismal situation owes to a deficiency in teaching and learning process in developing countries which is due to outdated curricula, lack of teacher training, obsolete pedagogy and the absence of engagement with the course content. Under such circumstances, Indian universities must apply KM in the right spirit to make an impact on the global platform. If done efficiently, KM can lead to improved teaching, research, innovation, industry income, internationalization and skill development. In this endeavor, Information and Communications Technology (ICT) can act as a catalyst for reducing spatial and temporal barriers and improving access to knowledge. In fact, if latest ICTs are used to their full potential, it can revolutionize the teaching-learning process.

The objective of this paper is to examine the role of KM through ICT in the improved performance of Indian Higher educational institutions. To achieve this, the paper identifies the various KM processes, KM practices and ICT tools impacting the various institutional performance parameters. The paper finally attempts to establish connections between KM and Institutional performance using a conceptual model.

Keywords: KM (Knowledge Management), Information and Communication Technology (ICT), KM processes, Conceptual model, Education system.

Introduction

The role of Higher education system in India's growth does not need any overemphasis. India has a young and vibrant population, huge qualified, semi-qualified, skilled and semi-skilled workforce which has the potential to facilitate its emergence in the global knowledge economy. However, there are various challenges ahead too, which are mentioned as under-

India's Gross Enrollment Ratio (GER 18-23 years) in higher education is about 23% compared to 86.7% in the US, 56.5% in the UK, and 39.4% in China (MHRD, 2016). India produced

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around 8,900 doctorates which is still a fraction of the number from US and China (Cyranoski et al., 2011). Less than 1% graduates opt for doctoral studies in India. A substantial number of Indian students prefer to go abroad and earn foreign degrees (Planning Commission, 2014). A chronic shortage of faculty is another problem. Around 30-40% of faculty positions are vacant. The student-teacher ratio is high in India at 24 as per AISHE report 2014-15, while it is 14 in USA and Russia. This situation occurs due to the lack of infrastructure, adequate teaching staff and pressures to accommodate more students in a class. The problem is further accentuated due to obsolete pedagogies and assessment focus on rote learning. Students have little opportunity to develop essential skills like critical thinking, logical reasoning, problem-solving and collaborative working (British Council, 2014). All this has resulted in graduates with low employability. There also exists a separation of research and teaching. The number of patent applications filed by Indians was only 0.3% of the world total. It is a very disappointing figure for a country with 17% share of the world population (Mint, 2016).

Under such circumstances, higher education institutions have "significant opportunities to apply KM practices to support every part of their mission," (Kidwell et al., 2011). KM initiatives can benefit education institutes tremendously in quick decision-making capabilities, curriculum development, research, and cost-efficient academic and administrative services. The emergence of Information and Communication Technologies (ICT) in the last decade has opened new avenues in KM in meeting the current challenges related to sharing, exchanging and disseminating knowledge in the higher education sector.

Talking about the originality of this paper, it is understood that there is still a scarcity of literature to understand how and what might be the contributions of KM practices in the growth of higher educational institutions.

The objective of the paper is to examine the role of KM through ICT in revolutionizing the performance of Indian higher education. To achieve this objective, a conceptual model is devised (see fig. 1) that studies the effect of KM constructs on Institutional performance. KM constructs are identified as KM processes (see table 1), KM practices (use table 2), KM tools (use table 3) and ICT tools (use table 4). Institute performance is measured through performance parameters (PP1 to PP10: table 5).

This paper is organized as follows. First, KM constructs have been identified and defined followed by a discussion on each of them. Subsequently, the effect of KM constructs i.e. independent variables on the performance of institutions i.e. dependent variable has been hypothesized. In the concluding part of this paper, the directions for further research in this area have been suggested.

Literature Review

Knowledge and Knowledge Management

Knowledge starts with data (raw facts), figures and numbers. Information is data put into context after appropriate processing. Knowledge is information which can be acted on. It incorporates experience and judgment which enables efficient decision making.

"KM is a discipline that promotes an integrated approach to identifying, capturing, evaluating, retrieving, and sharing all of an enterprise's information assets. These assets may include databases, documents, policies, procedures, and previously un-captured expertise and experience in individual workers" (Duhon, 1998). KM means making right knowledge available to the right person at the right time so that he can apply that knowledge for the benefit of the organization. According to B. Gates (2000), "KM is a very clever term to describe a very simple subject.

Many of us simply do not think in terms of managing knowledge, but we all do it. Each of us is a personal store of knowledge with training, experiences, and informal networks of friends and colleagues, whom we seek out when we want to solve a problem or explore an opportunity". The concept of KM exists for decades, but most organizations accept it only as theory and have not put it into practice correctly. Educational institutions do engage in knowledge transfer from teacher to students, but only some of them contribute to knowledge creation, knowledge acquisition, and knowledge documentation. No attempt is made to capture the tacit knowledge (knowledge that resides in mind) of the teachers who retire or resign and even the students who pass out. Even if the information is captured, it may not be well documented, which may lead to knowledge loss. Even many institutes do not have an open knowledge sharing culture. Knowledge is regarded as the valuable resource of an organization; thus, it requires proper management.

Research Synthesis

Several papers studied the relationship between KM and organizational performance. Most of the studies established a significant positive relationship between KM and organizational performance. Lee and Choi (2003) in his study on 58 firms, found that KM enablers and processes positively affect the performance of the firm. Another researcher, Wang (2007) conducted a study in 20 training centers in Taiwan in 2007 and found that right KM environment within the organization improves the core competencies of staff which further improves the job performance of employees. Nasser et. al (2011) in his study in Egyptian organizations proved that KM capabilities had a significant positive relationship with organization performance. However, cautioned that KM could improve performance if attention is paid to organization characteristics. Similarly, Donate and Canales (2012) proposed that an integrated knowledge strategy could improve business performance. In the same year, Oluikpe conducted a case study in Central Bank of Nigeria and found that if the staff is provided knowledge relevant to their task, it will enhance the efficiency of business processes and ultimately the firm will benefit. Again, Rasula et al. (2012) in his study on 329 companies concluded that KM practices measured through information technology positively affect organizational performance. Gholami et al. (2013) examined the influence of KM practices i.e. knowledge acquisition, knowledge storage, knowledge creation, knowledge sharing, and knowledge implementation on organizational performance in small and medium enterprises and found that they share positive relation with organization productivity, innovation, financial performance and staff performance. Thus mechanisms to collect knowledge from customers, suppliers and other stakeholders helped the organization to overcome challenges and improve performance.

Some other studies could not establish a direct relation between KM and organization performance. The most important of the one by Masa'deh et al. (2017) who researched in Jordan university reporting limited influence of KM on the job performance of staff. The authors reasoned that KM is not well organized at the University of Jordan and no consolidated efforts to facilitate knowledge sharing are made which might have resulted in such a situation. The same author in 2013 also could not find a direct relationship between knowledge sharing capability and firm performance. Similarly, Mills and Smith (2011) reported that while some knowledge resources, e.g., organizational structure and knowledge application bear a direct relation to organizational performance, others like technology and knowledge conversion do not. Similarly, Ferraresi et al. in his survey of 241 Brazilian companies in 2012 failed to find a direct relation between KM and business performance. He, however, noted KM affects business performance through a strategic orientation that prepares the cope up with market changes. Choi and Lee in 2003 noted organization performance depend highly on KM style. While dynamic style is effective, passive style is not.

From the above analysis, it is proposed that KM can improve business performance only if KM is applied in true spirit taking care of the other important organizational characteristics. Organizations must be prepared to face the challenges in KM implementation otherwise the desired results may not be obtained. Only right KM strategy can provide the right outcome (Li-An-Ho, 2008).

Research Gaps

Several papers studied the relationship between KM and organizational performance, but very few studied the relationship in the context of the educational sector. The current paper is an attempt to fill this gap. Very few higher educational institutions actively research or produce new knowledge. Mostly deal with knowledge transfer. Only a small number of unversities apply KM practices and tools for effective decision making and problem-solving. Thus, there is an urgent need for change management in higher educational institutions, due to the rising expectations of various stakeholders like enterprises, government and the society in the wake of increased access to knowledge through ICT, technical innovations, globalization, competition and the emergence of Net- generation.

Methodology

The methodology undertaken in this study is basically an extensive review of literature and discussions with the academicians and experts of the field to propose a conceptual framework. Independent variables KM processes, ICT tools and KM practices have been identified by systematic review of the literature using content analysis approach. The dependent variable i.e. KM performance parameters as Ranking (PP1), Publication (PP2), Placement (PP3), Internship (PP4), Higher studies (PP5), Collaboration (PP6), Patents (PP7), Rewards (PP8), Innovation projects completed(PP9),Student performance (PP10) were selected based on various credible national and international rankings benchmarks. The viewpoint of the experts was noted. Finally, a conceptual model has been proposed identifying these relationships. A prospective set of articles were drawn up from popular databases as ProQuest, Ebsco-Host, Emerald, Web of Science, Elsevier, Science Direct, and Google Scholar/books. The researches undertaken in different countries at different time periods were incorporated. Only English literature was referred. The following terms were used for searching the databases above:

"KM, ICT tools, KM tools, knowledge processes, KM practices, institute performance, technology."

To ensure the quality of papers, cases having low academic rigor (not published in peer-reviewed publications) or having an inadequate discussion about the theme were discarded from the sample after the first level of screening the abstract, review process and number of citations. Initially, 120 research papers were downloaded, but after pruning about 100 papers were chosen for the analysis. The constructs, their definitions, and sources are summarized in the literature table.

Conceptual framework

This paper intends to theoretically investigate and map the identified KM constructs with the performance of educational institutions. The goal is to determine the KM constructs (independent variables) that affect the performance of institutions (dependent variable). The paper also discusses the role of ICT in the proposed model.

Using a systematic literature review approach, the research identifies independent variables i.e. KM Processes (Knowledge Creation (KC), Knowledge Storage(KS), knowledge Transfer(KT) and Knowledge Application(KA) (refer table 1), KM Practices (KMP1 to KMP6: table 2), KM tools (KMT1 to KMT6: Table 3) and ICT tools (ICT1 to ICT8: table 4) on the key dependent variable

i.e. Institute performance measured through ten performance parameters (PP1 to PP10: Table 5). The paper later proposes a KM conceptual model (please refer figure 1) which seeks to find the effect of KM constructs on institute performance.

Table1: Identification of key KM Processes with their indicators

Processes	Operational Definition	Determinants/ Indicators	Source
KC Knowledge Creation	"Organizational knowledge creation involves adding new components or replacing existing components within the organization's tacit and explicit knowledge."	**KC1**: There is adequate corporate- academia interface. **KC2**: Opportunities for international collaboration are provided. **KC3**: My institution facilitates the further education of the faculty. **KC4**: Innovation and creation of new knowledge is encouraged. **KC5**: Resources for undertaking research and development activities are provided. **KC6**: Workshops	Pentland,1995 Lee and Choi, 2003 Chang Lee, Lee and Kang, 2005; Lin and Huang, 2008; Shim, J.,2010; Omerzel, D.G. et al, 2011;
KT Knowledge Transfer	"The exchange of knowledge between and among individuals, teams, and organizations."	**KT1**: Regular meetings are conducted to provide valuable information in my institute. **KT2**: Cross-functional teamwork is adequately used for problem-solving. **KT3**: Organizational members are willing to share knowledge possessed by them. **KT4**: I am willing to share knowledge with other organizational members. **KT4: I feel sharing knowledge with colleagues broadens my horizon.** **KT5: Sharing knowledge improves my credibility.** **KT6: Conferences and seminars**	Yew W.K . and Elaine Aspinwall, 2005 Chou, 2005 Chow and Chan, 2008 Luiz, A and Bernardo, L. 2009 Shim, J.,2010 Masa'deh, Ra'ed, et al., 2017 Turyasingura, 2011 Paulin and Suneson, 2012
KS Knowledge Storage	"It includes knowledge residing in various forms, including written documentation, databases, and tacit knowledge acquired by individuals and networks of individuals."	**KS1**: Database of employees, their expertise and achievement are regularly updated. **KS2**: There exists databases, repositories and IT application to store knowledge for easy access. **KS3**: Several written devices, notice boards, and publications to store and disseminate the captured knowledge exists.	Tan et al., 1999 Yew Wong, Kuan, and Elaine Aspinwall, 2005 Chang Lee, Lee and Kang, 2005 He, Qiao and Wei, 2009 Turyasingura, 2011
KA Knowledge Application	"The capability to transfer and use knowledge for realization of its value."	**KA1**: Institute website is regularly updated. **KA2**: Curriculum is regularly updated on the basis of recent developments. **KA3**: My feedback is considered. **KA4**: My institution recognizes and rewards people who create and share knowledge.	Alavi and Leidner (2001), Gold et al. (2001) (Chong, Chin Wei, Pei and ArnifaAsmawi, 2012) (Masa'deh et al., 2017)

Source: Compiled by the author

KM PRACTICES

Besides KM tools, there are specific KM practices which affect the performance of an institute. To realize the maximum benefit from KM conducive KM environment must be present. According to Rasula et al. (2012) organizational culture highly contributes to KM. This is so because "culture determines the basic beliefs, values, and norms regarding the why and how of knowledge generation, sharing, and utilization in an organization." KM success relies heavily on the trust, teamwork, creativity, motivation, and collaboration among employees. Innovation, intrinsic rewards and co-workers support also positively affect knowledge sharing practices. Sharing knowledge generates capabilities that lead to a better firm performance (Wei, 2012; Ipe, 2003; Kogut & Zander, 1996). Wong and Aspinwall (2005) proposed Critical Success Factors, i.e., leadership and support; culture; information technology; organizational infrastructure; strategy; processes and activities; motivational aids; resources; training and education; and human resource management to form the basis for KM adoption in the SME sector. They emphasized that successful KM require proactive top management support. The leaders can contribute to an environment in which knowledge creation, cross-boundary learning and knowledge sharing can

Table 2: KM Practices with their brief description and source

Practices	Brief description	Sources
KMP1: Culture	"Culture determines the basic beliefs, values, and norms regarding the why and how of knowledge generation, sharing, and utilization in an organization." Culture determines the level of trust, risk-taking behavior, tolerance of mistakes, idea sharing and innovation in the organization	Davenport et al. (1998), APQC(1999), McDermott and O'Dell (2001), Stankosky(2001), Wong and Aspinwall (2005), Mills and Smith (2011), Rasula et al. (2012) and Frost (2014)
KMP2:Management leadership and support	Top management acts as a role model and they determine the objectives of the organization. Their support is es sential to employee motivation , behavior and action.	Wong and Aspinwall (2005), Chong (2006), Akhavan and Jafari (2006), Foot and Hook (2008), Zack et al. (2009), Lee et al. (2011), Andreeva and Kianto (2012), Frost (2014) and Zeinalnezhad et al. (2014)
KMP3:Motivation, rewards, and recognition	Employees can be motivated to contribute to KM. It can be done by providing monetary incentives, or non-monetary incentives like praise or recognition.	Davenport et al. (1998), Liebowitz (1999), Yahya and Goh (2002), Al-Busaidi and Olfinan (2005), Wong and Aspinwall (2005), du Plessis (2007), Prieto -Pastor et al. (2010), Rasula et al. (2012)
KMP4: Training and education	Training and other educational programs are designed to impart relevant knowledge, skills, and abilities to the employees. Training can be both on-the-job and off-the-job.	Davenport et al. (1998); Holsapple and Joshi (2000), McDermott and O'Dell (2001), OECD (2003), Wong and Aspinwall (2005), Chong (2006), Bozbura (2007), Kianto (2011) and Palethorpe (2014)
KMP5: Benchmarking, Best practices	Exemplary practices followed within and outside the organization are documented so that they can be replicated or provide motivation for future tasks.	Drew (1997), Moffet et al. (2003), Hung et al. (2005), Chong (2006), Xu et al. (2010), Andreeva and Kianto (2011) and Zeinalnezhad et al. (2014)
KMP6: Autonomy and Employee involvement	Autonomy empowers knowledge workers to make decisions and gives them control over the pace of work	O'Brien and Crauise (199 5), Ward (1997), McCune (1999), Ryan and Prybutok (2001), Moffett et al. (2003), Kianto (2011) and Appelbaum et al. (2014)

(Source: adapted from compiled Sinha et al., 2015)

flourish. Similarly, Lee et al. (2011) found that collaboration, learning culture, top management support, and IT support affect the knowledge process capabilities. However, Mills and Smith (2011) in their study showed that though organizational structure, knowledge acquisition, knowledge application and knowledge protection were significantly related to organizational performance but technology, organizational culture and knowledge conversion did not have a significant impact.

Table 3: KM Tools with their application area of KM

KM Tools	Application area of KM
KMT1: R & D centers	The research and developmental activities enhance innovation and thereby knowledge creation, which is the source of competitive advantage for the firm.
KMT2: International collaboration	Collaboration builds alliances which permit exchange of ideas and creation of knowledge through brainstorming.
KMT3: Communities of practice	Communities of practice are small informal groups made by members voluntarily to discuss and share knowledge, ideas and insights on a topic of common interest. The members may meet face to face or online.
KMT4: Workshops	Workshops entail activities and discussion that enhance learning.
KMT5: Conferences and seminars	Conferences and seminar facilitate knowledge creation and dissemination through intensive discussion and viewpoints of experts on a particular subject.
KMT6: Cross-functional teams	A cross-functional team refers to a group of people with different functional expertise working towards a common goal. It may include people from finance, marketing, operations, and human resources departments. Generally it includes employees from all levels of an organization.

Source: Compiled by the authors

After discussing the KM practices and KM tools, we would like to discuss ICT tools. The following table presents the important ICT tools that have developed over a decade and their contribution in KM of the institute. Besides the most commonly used tools like power point, wiki, video conferencing, search engine, social networking, and apps; the table also states the latest technology like Internet of things, artificial intelligence, 3D printing and Massive Open Online Courses that are getting popular.

Table 4: ICT Tools facilitating KM in Higher Education

ICT tools	Application area of KM	Authors and year
ICT1: Database management system,Data warehouses, data mining, and virtual reality modeling	Team collaboration and groupware, natural language queries of data, sharing information on best practices and anytime/anywhere online learning	John H. Milam (2004)
ICT2: Use of Blogs	Blogs for knowledge sharing purpose	Jeremy B Williams, Joanne Jacobs (2004)
ICT3: Virtual communities, Personal Blogs and mental maps	An Environment for Knowledge Management in Scientific Research and higher education centers	Jonice Oliveira, Jano M. de Souza, Rodrigo Miranda, Sérgio Rodrigues (2005)
ICT4: Videoconferencing, K Portal, search engine,	Management of knowledge for student courses, to improve internal document management, to increase the level for information and knowledge dissemination	Ruslai Abdullah (2007)
ICT5: Web 2.0 tools like Dropbox, Google Docs, wikis, GoogleApps, PDA	Web 2.0 applications as a means of bolstering up Knowledge Management	Thomas Bebensee, Remko Helms and Marco Spruit (2009) Frank Nyame-Asiamah(2009)
ICT6: Massive Open Online Courses (MOOCs)	Life-long learning	New York Times (2012), Dasarathy et al. (2014), Baturay (2015)
ICT7: Virtual classroom webinar	Blended learning Flipped classroom	Power and Jacques (2014), University of Queensland (2016)
ICT8: Artificial intelligence, online - simulations, 3D imaging, cloud-based education, gaming, Internet of things	The future of higher education Technology changes in the Past, Present and Future I-Campus, I-lab, x-tutor	Ahmad (2015) The Millenium Project (2006-07) Brandeis University (2015) MIT (2016) Gupta and Jain (2017)

Source: Toro and Joshi, 2013 and Gupta and Jain, 2017.

Institute Performance Parameters

To measure the performance of educational institutes, different parameters were used by authors like learning, innovation, productivity, customer satisfaction and other financial parameters. The current paper uses objective criterion from national and international rankings benchmarks which have not been used as yet in the literature.

Table 5: Institute performance parameters (dependent variable) derived from NAAC, NIRF, Times Higher Education and QS report, 2017

KM Performance	Benchmarks			
Performance Parameters (PP)	**NIRF**	**NAAC**	**World University Ranking (Times Higher Education)**	**QS Ranking Methodology**
PP1: Publications	**Parameter 2** Research and professional Practice	**Criteria 3** Research, Innovations and Extension	**Parameter 3** Citations (research influence)	**Criteria 4** Citations per faculty
PP2: Placement	**Parameter 3** Graduation Outcome	**Criteria 5** Student support and Progression	---	**Criteria 2** Employer Reputation
PP3: Internship	**Parameter 3** Graduation Outcome	**Criteria 5** Student Support and Progression	---	**Criteria 2** Employer Reputation
PP4: Higher studies	**Parameter 3** Graduation Outcome	**Criteria 5** Student Support and Progression	---	---
PP5: Collaboration		**Criteria 3** Research, Innovations and Extension	**Parameter 5** Industry income (knowledge transfer)	---
PP6: Patents	**Parameter 2** Research and professional Practice	**Criteria 3** Research, Innovations and Extension	**Parameter 2** Research (volume, income and reputation)	---
PP7: Teaching and learning	**Parameter 1** Teaching Learning and Resources	**Criteria 2** Teaching-Learning and Evaluation	**Parameter 1** Teaching (the learning environment)	**Criteria 1** Academic Reputation
PP8: Innovation projects	**Parameter 2** Research and professional Practice	**Criteria 3** Research, Innovations and Extension	---	---
PP9: Industry income	---	---	**Parameter 5** Industry income (knowledge transfer)	---
PP10: Student performance	**Parameter 3** Graduation Outcome	**Criteria 2** Teaching-Learning and Evaluation	**Parameter 1** Teaching (the learning environment)	**Criteria 1** Academic Reputation

Source: NAAC, NIRF, Times Higher Education and QS report, 2017

Conceptual model:

Based on the discussion above, a conceptual framework (use Fig. 1) has been proposed based on the linkage between KM constructs comprising KM processes, KM practices, KM tools and ICT tools that impact the performance of educational institutes.

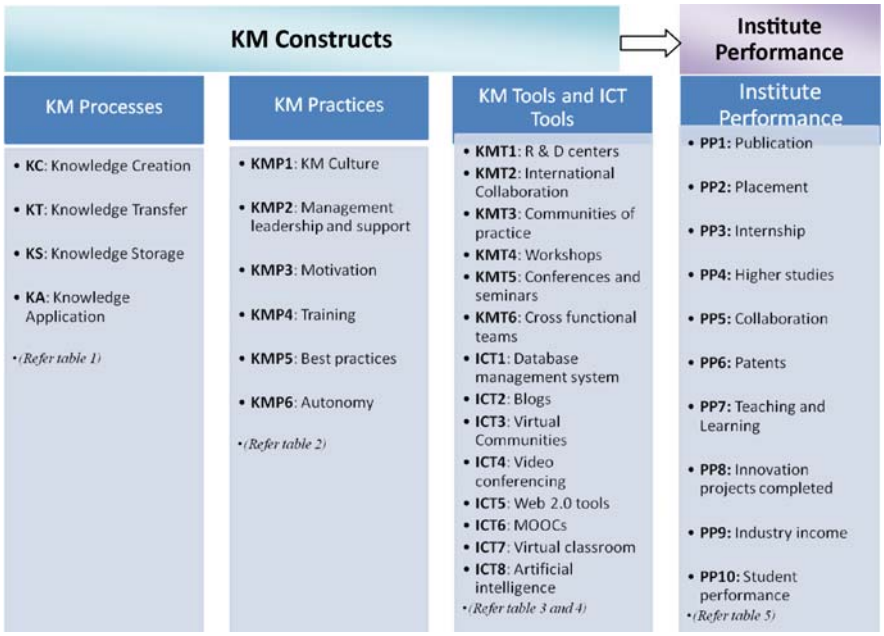


Figure 1: Conceptual model
(Source: Compiled by the authors)

Based on the review of the literature, a conceptual framework (use Fig. 1) has been proposed which establishes the linkage between KM and institute's performance. It has been found that KM tools can improve the performance of institutes by creating core competencies in the human capital. Wong and Aspinwall (2005) and Oluikpe (2012) noted that training, development, seminars, and workshops could provide the staff with the knowledge relevant to their tasks. Likewise, KM practices provide a favorable KM environment. If there is trust, collaboration, top management support and risk-taking culture, then staff will be motivated to innovate and share new knowledge for the benefit of the organization. ICT tools provide the necessary infrastructure to enable efficient KM. A rich database, archives of best practices, online support will enable knowledge acquisition and transfer by reducing spatial and temporal barriers. Finally, the proposed model helps us better understand the performance parameters of educational institutions which have been derived from national and international rankings framework. These parameters act as a guide to educational institutions and help them in achieving the global standards. Thus, the model that talks about raising the performance of educational institutes through KM and ICT opens up a plethora of future direction.

Limitations

The model has limitations on several counts. The variables and their relationships have been illustrated based citations in the literature. The model is built conceptually, suggesting further empirical studies to validate the findings. This paper can also be considered a working paper and there can be numerous studies in various domains.

Future Scope

The scope of this paper is limited and can be extended using real-life case studies. Further empirical studies can also be conducted to validate the proposed model. A comparison of public and private universities can be made identifying the penetration of ICT and KM and thereby impacting the institute performance. Similarly, a comparison of Indian and foreign universities can be made. Finally, the challenges in raising the quality of education can be identified, and suitable steps can be suggested to overcome them.

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Knowledge Management- Key Lever for Business Transformation: A Case of an IT Organization

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Learning gives Creativity, Creativity leads to thinking, Thinking leads to Knowledge and Knowledge makes you Great - Dr APJ Abdul Kalam

Abstract

Knowledge is critical for success of any individual and for an organization the collective knowledge of employee is crucial for success. Knowledge Management (KM) function ensures the seamless knowledge flow from Experts to Knowledge seekers. This paper is aimed at sharing few insights on how KM plays critical role in bringing the business transformation across the organization and in this case an IT organization is considered. In the current Digital world, various tools and technologies are acting as catalyst for bringing the excellence or value through KM initiatives. Business transformation elements like Customer satisfaction, productivity improvement, and cultural shift towards sharing the knowledge are discussed in this paper. For any IT organization, customers are critical and this paper described about how organization's collective knowledge is being demonstrated to the customers in every interaction and delivery of the projects. Similarly effective usage of KM has resulted into significant improvement in productivity of various teams. 80+% employees engagement in KM initiatives is bringing the cultural transformation along with augmented skills. Based on the overall results, there is a strong positive correlation between effective KM usage and business transformation elements.

1. Introduction

Knowledge Management (KM) plays a vital role in Business Transformation journey of any organization and driving KM culture is more challenging in any IT/BPS organization due to the high dependency on people. The definition of Knowledge Management is different for different people. At macroscopic level, Knowledge Management can be defined as a systematic approach to get the right knowledge to right people at right point of time so they can be more efficient and effective and further deliver value to our customers.

Knowledge resides within the employees of the organization whether this is related to domain, technology, process or practice. Knowledge grows day-by-day while executing projects and interacting with various customers or stakeholders.

KM focus is on capturing constantly growing knowledge, creating knowledge artifacts, distilling some of the knowledge assets, sharing the knowledge assets with relevant groups and of course enabling various teams to apply this knowledge. In addition to this, KM focusses on

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collaboration to enable anyone in the organization to reach out to Subject Matter Experts of various domains, technologies or practices for solutions to problems. The inherent objectives in the whole KM cycle are to retain knowledge within the organization, enable new hires to come up to speed in their project execution, enhance knowledge of the workforce on domain, technology, or market trends, and provide value added service to our customers.

KM journey in the specific IT organization has started way back in 2000 and KM initiatives matured over a period of time from simple repositories to KM 4.0 (Digital Intelligence) in the last few years. In this journey, the organization has won many awards as Most Admired Knowledge Enterprise (MAKE) at Global, Asia and India level. Filed around 30 patents in KM domain and published KM case studies in variousforums.

2. Objectives

Key objectives of Business Transformation journey of any organization are

1. Customer Satisfaction
2. Business Growth
3. Improved Margins
4. Innovation
5. Employee satisfaction

Figure 1 illustrates the role of KM for business transformation in various dimensions.

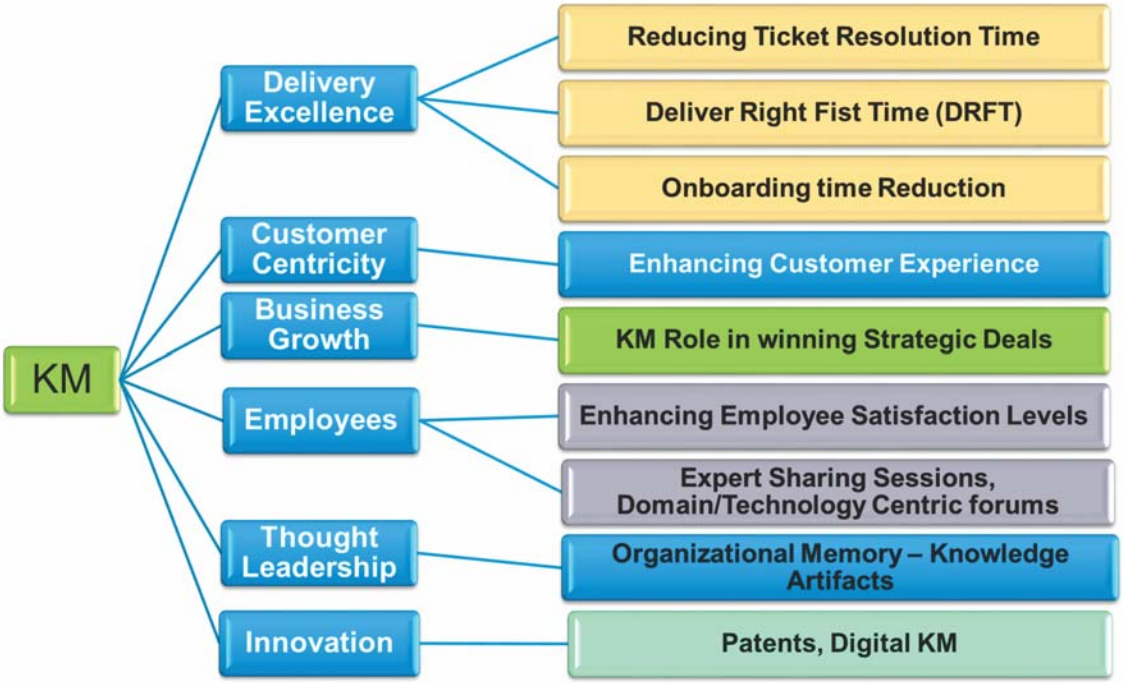


Figure 1: KM for Business Transformation

3. KM Frameworks for Business Transformation

Business transformation objectives are achieved with a KM strategy designed to simplify, standardize, segment, secure, and sustain knowledge. The KM effectiveness and efficiency is assessed based on the KM maturity of groups in the organization to capture, create, share, and apply knowledge with a value generation focus.

3.1 KM Strategy

KM strategy used 5S framework (Figure 2) to simplify the business process for knowledge creation and sharing by standardizing knowledge management practices, measurement, and maturity levels for all segments in the organization, providing a secure environment to ensure customer IP is protected, and sustaining the knowledge management setup, culture, design and deployment.

KM initiatives are aligned with the strategy to ensure organizational knowledge is available to people at the right time. Quintessentially the strategy entails building and maintaining a robust KM that one can take to its customers, to add value to business, and help customers make informed decisions. Just like one size does not fit all, different groups have various knowledge management needs. The 5S strategy addresses the segmentation to achieve its objectives across delivery, consulting, services, functions, practices, sales, and business process outsourcing segments. The KM Plan is defined to ensure required support is provided for organic and inorganic growth of businesses. The culture of the organization encompasses every aspect of employee's day-to-day work activities and is efficiently structured to implement from employee onboarding phase till they become experts in their area of work. Role based knowledge learning activities are included to help employees achieve their goals. Employee goals that are set at the beginning of each financial year include goals on knowledge creation and sharing. Employees are provided with competency frameworks to help them achieve their knowledge creation goals.

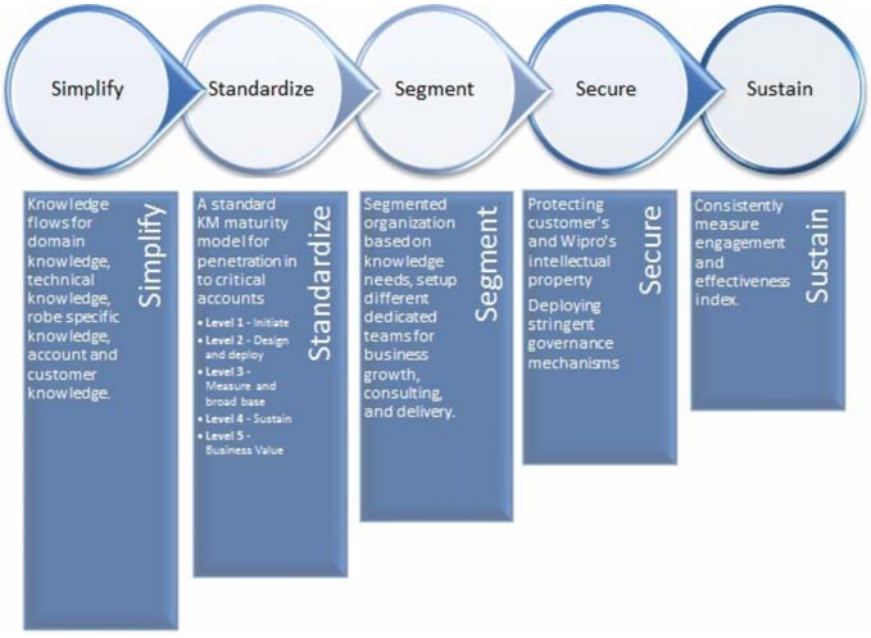


Figure 2: 5S Framework for KM Strategy

3.2 KM for Customer Satisfaction

KM for Customers through Collaboration (KMC^2) is a KM initiative offering a bouquet of KM features through a web-based application called Crystal where customers can participate in discussion forums, engage as subject matter experts, collaborate with project teams, and leverage collective knowledge and expertise in domain, technology and thought leadership.

Crystal gives customers a transparent and clear view of the overall engagement performance on-the-fly. With Crystal, customers can:

- Share ideas and concerns in live discussion forums
- Participate in knowledge sharing initiatives
- ´ Follow thought leadership opinions

Project teams can use KMC2 to engage in discussions with Customers on various topics. Since it demonstrates Thought Leadership &its perceived value add by customer makes it a differentiator. KMC2 also brings with it the potential to take ideas to the next stage through a joint effort.

3.3 KM for Business Growth

Knowledge Management initiatives provide the capability of bringing organizational collective knowledge in domain and technology areas to the project teams during execution. This is one of the differentiating factors since customers experience expertise and knowledge in their project delivery. Another key differentiating factor is retaining the customer knowledge within the organization irrespective of employee churn or attrition. These KM initiatives are being positioned as differentiators to our customers during the sales process, which results in winning more deals.

There is another dimension of KM which will help any organization to grow. The reusable components that are being captured/generated as part of Knowledge creation will help the organization to reduce the effort that is required to deliver a project. The reduction in the effort is directly correlated to the win ratio of new engagements

3.4 KM for Delivery Excellence

Knowledge Universe is one-stop-shop for end-to-end account engagement knowledge. The goal is to simplify the knowledge management from Day 1 and ensure that programs and projects have efficient knowledge management system for flawless execution.

The first element that is activated in the Knowledge Universe is something called the Day 1 site. All artefacts required during the sales cycle are managed on the Day 1 site which is active for 90 days. If a deal is won with the customer within those 90 days, the site remains active and Transition elements are activated on the site. As and when transition activities complete, Program and Project sites are set up. Eventually the Delivery Review site is activated. An overall account status is displayed that catches the eye with one glance on the site. The Knowledge Universe also streamlines management activities by providing templates and tools for management to manage confidential customer knowledge in an access-restricted account governance space.

Employees can use the Knowledge Universe to collaborate and find Experts, solutions to queries, discussions, wikis or use portals, war rooms, and blogs. KM analytics is designed in the site

to display the most active users, documents, experts, and contributors. Apart from the mandatory elements, the site can host newsletters, dashboards, announcements, initiatives, fun events, team roster, etc. The Knowledge Universe is designed for users to find and collect internal knowledge and best practices. It improves knowledge access since it is designed for employees to identify ways to facilitate, find Experts, and to transfer or apply the knowledge. It also enhances knowledge culture, consistently fostering knowledge sharing, reusing and applying existing knowledge. It manages knowledge as an asset since it involves demonstrating effective use of knowledge management has resulted in cost and effort savings.

In a nutshell, the Knowledge Universe inherently simplifies knowledge flows since it is structured based on segments such as business development, management, product teams, operations, and millennials and is supported with analytics designed to push the relevant knowledge to right roles or groups. The knowledge managed in the Knowledge Universe is secure to ensure that knowledge specific to a business unit, customer account or project team is available only to those relevant groups, and enterprise knowledge is made accessible to the entire organization. Generic technology, domain and practice knowledge is pushed to all of these zones in the universe.

Knowledge Universe has additional frameworks like SHINE (Seek, Hands-on, Interact, Network and Enrich) and KEDB (Known Error Database) which will ensure the flawless execution.SHINE framework is a unique mechanism for faster knowledge transfer and learning environment to enable new joiner's inducted into account in a structured process and transferring the tacit knowledge between expert and new joinee. SHINE learning framework that consists of five tracks, viz., Seek, Hands-on, Interact, Network and Enrich to induct new employees into customer projects. Project members can do self-learning, receive guidance from mentors and discuss with the surrounding community. It also facilitates cross skilling within teams and has enabled individuals to improve their competency levels in a short span of time.

KEDB is a collection of knowledge generated through past experience judiciously used by employees to resolve known and unknown problems in an efficient and effective manner leading to client satisfaction. KEDB documents the knowledge gained regularly as part of incident resolution and problem analysis in support and maintenance projects. This enables support teams across the globe to access and maintain the content in KEDB in a collaborative manner with the key objectives of increasing the "Ticket resolution rate" and improving "Turnaround time".

3.5 KM for Innovation

In today's constantly changing business world, innovation is the mainstay of organizations. The speed and complexity of innovation increase with growth of knowledge in organizations. In other words, innovation relies heavily on availability of knowledge. KM drives initiatives to make knowledge available for innovation, and keeps the innovation engine oiled. Ensuring knowledge flow to build a culture of consistently innovating warrants fresh thinking and staying relevant in the future. This results not only in shorter IT lifecycles and higher rate of new product development, but also execution excellence, and maximizing value of customer businesses by building solutions that integrate deep industry insights, leading technologies and best-in-class delivery processes.

As shown in Figure 5, the KM phases and innovation phases map at various levels depicting how the innovation process uses organizational knowledge in the production of knowledge based innovative products and solutions.

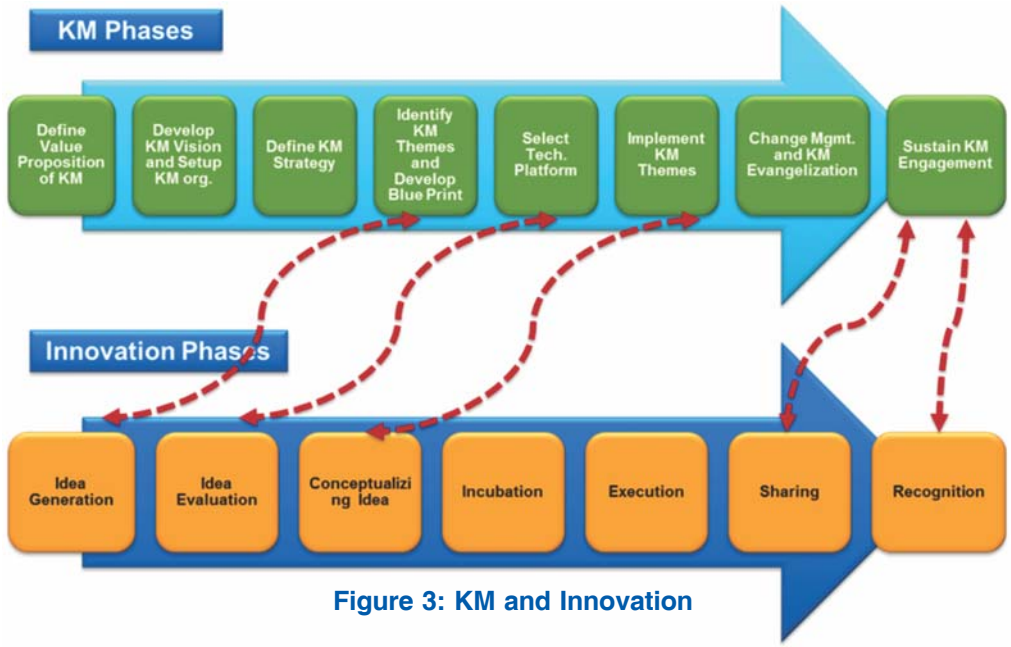


Figure 3: KM and Innovation

3.6 KM for Employee Satisfaction

KM provides the system, knowledge assets and resources that bridge the gap between the SMEs and rookies. KM caters to baby boomers in the organization as well as the Gen X and Millennials by providing traditional as well as new age and state-of-the-art KM initiatives. Few KM initiatives that provide innovative approaches for the workforce to capture, share, use, and retain knowledge are listed here.

- **Gamification:** Gamification drives the competitive spirit among with workforce and integrating the knowledge sharing process into the well-known games in the region will boost the engagement in KM initiatives and further strengthens employee satisfaction levels. The games are designed to be fun, but each has a behavior-change component to encourage employees to build their skills, learn new concepts, and share their knowledge.
- **Storytelling**: A concept to share knowledge and success stories, through various communiques such as KM Employee Speak videos and KM impact stories (aka KMpact).
- **Video and Audio based KM**: Transferring knowledge through audio and video knowledge sharing sessions, leadership talks, best practices, quick tips, FAQs, etc.
- **Analytics based Knowledge Repositories**: Deploy analytics on the search engine to utilize for pushing relevant knowledge to employees. Social Network Analysis (SNA) has also helped identify the networking patterns of employees and gaps between Millennials and other segments/teams.

4. Digital Intelligence – KM for Futuristic Business

Positive disruption is happening in the Industry with Digital Technologies. The role of traditional KM is diminishing and standard Document based or Template driven KM will not have any place in the organizations. Knowledge Capturing and Transferring should happen on the Fly and current Digital revolution is strengthening the KM role further in accelerating the Business Transformation objectives that were depicted in Fig 1.Few use cases of these technologies are discussed here.

Virtual reality will be helpful for project teams who are working in different domains and developing software applications with limited practical exposure the scenarios on the ground. Virtual reality will give the experience of end user whether it is drilling process in Oil & Gas Industry or Sophisticated Nano tubes manufacturing to the developer who writes the code. This experience will help the software engineer to develop more user centric, reliable and robust application. This significantly enhances the success rate of projects.

Analytical insights of unstructured data like review comments, customer feedback, root cause analysis brings proactive alerts while executing the projects and combining this with Knowledge base (counter measures, remedial solutions and the way the experts handle such scenarios) will help the organization to prevent the failures. Digital technologies like Artificial Intelligence, Machine Learning have a significant role to support this.

Internet of Things (IoT) simplifies the connectivity between two entities and make it real. IoT eliminates the challenge everyone is facing in collecting/codifying the Tacit knowledge. Though this is in the early stages but there is high probability of capturing the mental maps of expert and transferring the same to new comer.

One of the recent reports mentioned that 88% of employees do not have passion for their work and Employee disengagement costs more than $500 billion per year for US economy. Bringing Gamification elements into KM will drive employee engagement and enhances learning, Knowledge Sharing, Collaboration and Knowledge Application significantly. Gamification as a concept scores well to strengthen the urge for learning and to sustain the learning through KM practices. The concept uses the fundamentals of gaming which entails fun, an eagerness to do something challenging based on a set of rules, a competitive spirit with a desire to takeaway not just recognition and rewards but most relevantly, knowledge.

KM Engagement in an organization revolves around Knowledge Artifacts submission, usage, Knowledge sharing sessions, Knowledge Base articles, Project specific trainings and assessments, etc. Figure 5 illustrates the magnitude of the KM engagement.

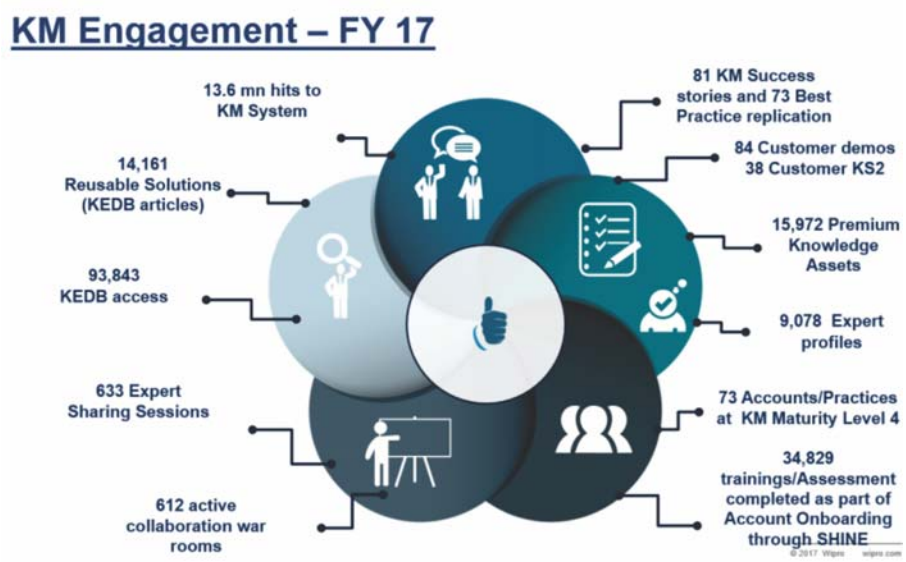


Figure 4: KM Engagement in the IT organization

5. Results/Benefits

Impact of KM on Business Transformation journey of the IT organization is indicated here

- High adoption of KM at account level resulted into higher customer satisfaction levels
- Significant improvement in productivity for the accounts where KM usage is high (30+% improvement)
- KM frameworks have resulted in reducing the cycle time (around 40%) for Onboarding employees into accounts and ensured 100% mandatory induction compliance

6. Summary

Knowledge Management vision, strategy and objectives should be aligned closely with the business objectives. KM strategy should have innovative initiatives to foster a culture of knowledge sharing and collaboration. KM uses state-of-the-art and emerging technologies to efficiently manage the organization knowledge, enable knowledge push to relevant users, and produce value for internal as well as external customers and stakeholders. KM caters to the knowledge needs of a cross generational workforce and taps into all the hatches that contribute to the organizational knowledge.

The KM systems, tools, applications framework, standards, processes, measurement models and culture together yield business growth, improve customer satisfaction, create value for stakeholders, partners, suppliers, and enables business transformation.

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Changing the Workplace with Technology Driven Flexible Management

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Abstract

Advancements in the Information and Communication Technologies (ICT) transformed the traditional workplaces into digital workplaces. Human resource is regarded as a significant asset in terms of skills and abilities. Flexibility in managing human resources is an important aspect in organizational productivity. With new technologies and digitization, organizations require a flexible system in its portfolio which will encourage employees with multiple job skills and abilities to prove themselves in result driven environment. In this paper, we present a framework that facilitate interrelationship between human resource flexibility and organizational effectiveness. Further, we establish the possible role of organizational citizenship behavior and employee interest to stay with the organization.

Keywords: *Human resource flexibility; organizational citizenship behavior; intent to stay; organizational effectiveness.*

Introduction

Human resource (HR) is regarded as a significant asset in terms of skills and abilities. There is a strong relation between productivity and employee-employer relationship. So, flexibility of human resource is an important aspect in organizational productivity. In many organizations profits define employees incentives where as in government organizations and academics, incoming and outgoing time is very important where a punctual employee is treated as best employees irrespective of his contribution to the organization. Family responsibilities of staff have a direct effect on the company's productivity. An employee who is worried about the care of an elderly parent, or kids is unlikely to give full attention to the task at hand. Flexible management is a cost-effective way of dealing with these issues. Managers who have the skills to be flexible and the strategies to work with employees for a win-win situation are more productive and favourites among their employees. So it is the time to change the workspace with the changing realities of society. With the advancement of technology in this digital world *Flexible management* can become a reality.In the fast changing era of Information Technology, new technologies and digitization, organizations require a flexible system in its portfolio which will encourage employees with multiple job skills and abilities to prove themselves in result driven environment.

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In this paper, we propose a framework that facilitate interrelationship between human resource flexibility and organizational effectiveness. We study different type of Indian organizations that possess possibility of flexibility and its influence on organizational effectiveness. This work also establishes the possible role of organizational citizenship behavior and employee interest to stay with the organization. The rest of the paper is organized as follows. In Section II, we discuss background and related work. Section III presents our proposed framework along with architecture details for Flexible Workspace management related Human Resources. In Section IV, we highlight the important three dimensions of HR towards digital workplace. We conclude the paper in Section V.

Background and Related Work

Flexibility at workplace deals with making flexible as to when, where and how a person will work to meet his employers needs. Flexibility at workplace relates to flexibility in time, location and flexibility to choose area of interest. Flexibility is proposed by the employer and adopted by the employee with an aim to increase employer-employee relationship and thereby increase the overall productivity. The organization may adopt two types of flexibility, one in which there is predefined policy of the organization and one which is given out of concern for the employee. It is to note that formal flexibilities can be measured whereas informal cannot be.

One of the most famous models of human Resource flexibility is the *'Model of the flexible firm'*, developed at the Institute of Manpower Studies[12]; where the 'flexible firm' is defined as a workplace management and organization technique which optimizes HR through flexibility based on segmenting the workers into peripheral and core groups. The core groups of employees are difficult to replace as they have a specific skill set or experience, meanwhile the peripheral group consists of employees who could easily be replaced or who are only needed in the organization for either peak periods or for specific jobs.

The 'core group' of employees are full time, they show high levels of engagement within the organization and they have many different skills. They are also flexible in working time, in order to adjust more closely to production demands. These employees are usually managers, technicians, and designers. The employees in the core group present *functional flexibility* so that they can move between different roles and tasks. Functional flexibility is usually associated with the employees' abilities and a set of tasks that require different skills. On the other hand, Wright and Snell (1998), described human resource flexibility composed by three sub dimensions: employee skill flexibility, employee behavioral flexibility and HR practice flexibility.

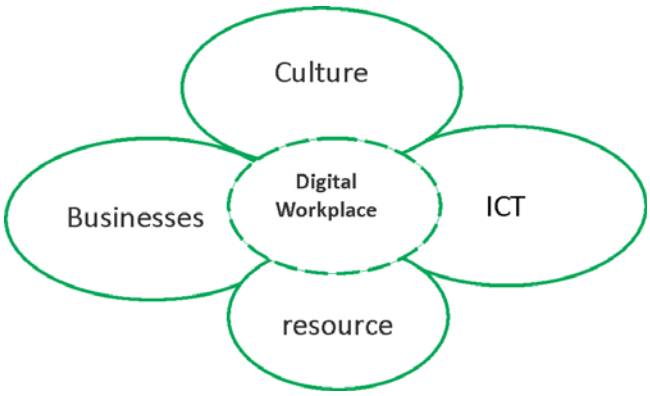


Figure 1: Framework for Technology Driven Flexibility

Information and Communication Technologies (ICT) made a significant impact on various businesses and transformed the traditional workplaces into digital workplaces. The three main characteristics of digital workplace are **3C**s: (i) Communication, (ii) Connectivity and (iii) Collaboration. These 3Cs help users/employees to work in unprecedented ways. We introduce 'Culture' as an additional dimension that creates adaptive workplace and allow flexibility towards organizational empowerment. That is, the digital workplace brings 'cultural change' in a working environment. The benefits of digital workplace include work-life balance, work from anywhere, work from anytime, knowledge sharing, etc.

Figure 1 shows high-level overview of our framework that enhances flexibility in the workplace. The major aspects that influence the workplace are (i) Business with respect to their policies, (ii) Information and Communication Technologies (ICT), (iii) Human resources and (iv) Culture. Figure 2 shows an architecture framework towards achieving Better Employee Engagement and Employee Inclusive workplace. Major infrastructure requirement include cloud, data center and networking.

Technologies that drive digital workplaces are e-mails, Virtual Conferences, Virtual Meeting rooms, Chatbots, Video calls (e.g., Skype), Artificial Intelligence (AI), etc. AI transforms the workplace the way manger perform their works and interact with their peers and team members. For instance, AI helps managers in mining the vast amount of data related to workers like skills, experience, performance, past works carried out, etc. The patterns from these data is useful to allocate works based on the skills, portfolio management (placing employees in the appropriate units/departments), etc. Further, AI driven Digital Workplaces allow creating/configuring bots (virtual agents) so that the bots can estimate the time taken by each task (based on the historical data), assign tasks to appropriate workers, schedule meetings, etc. The technologies create digital workplace innovation that continuously improve the organizational effectiveness and employer-employee relationship in a more informed manner. Finally, technology and culture change along with 3Cs make better workplace. Further, digital workplaces that facilitate flexible management improve the efficiency, productivity and overall workplace practices. Some limitations of these changes in workplace are security and privacy, work on any time zone, spoofing, etc.

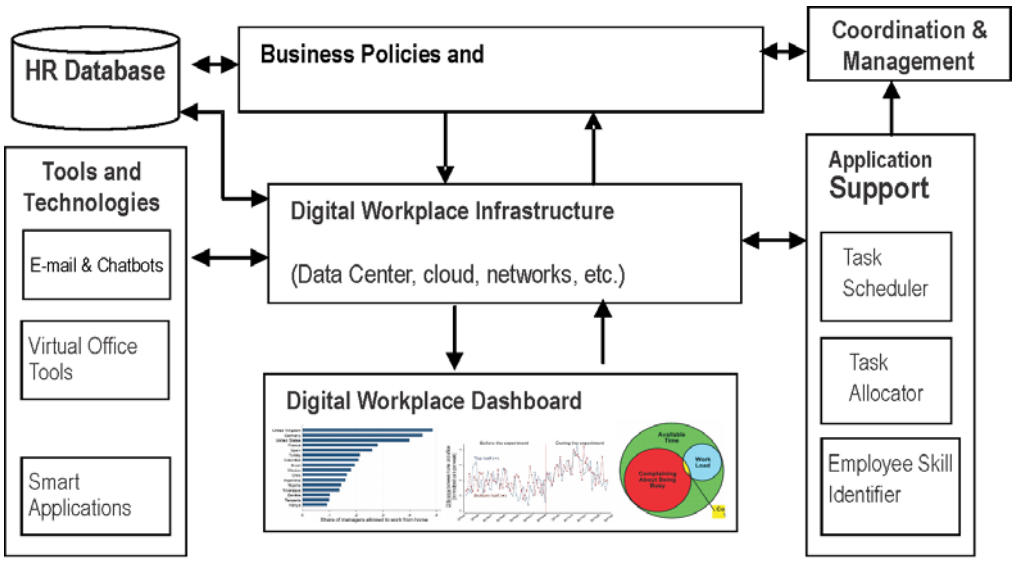


Figure 2: Architectural Framework for Digital Workplaces

Flexibility in Work Cluture

In this section, we discuss three dimensions namely work from home, working in shifts and flexibility in skills, which results into changes in culture at workplaces.

A. Flexibility in place of working (Work from home)

There are two sides of the coin when it comes to working from home. One side is no work will be done as there is no monitoring where as other side is workers will be happier and more productive as, when required, they have work home balance. While a few workers feel that there is more productivity at home and more distraction in the office with wastage of travel time and friends chitchat and unnecessary meetings, others feel there is a lot of distraction at home with TV and family around. It all depends on the personality of the worker and the kind of work in hand.

Recent studies have supported the idea that working from home - for the right people - can increase productivity and decrease stress. Several studies show that supporting work from home saves money for the company - an added bonus on the employer side.

The IT industry is well known for its shift schedules and work from home option. With networking going stronger and with the rise in facilities such as VPN chats, Video calling facility and wireless internet, people across the globe are always connected with one another as if they are all at one place. Technology experts across the globe can be shared by more than one company instead of permanently hiring them for a short schedule as a package which adds advantage to the company and the skilled person has more opportunities than bond.

Employer Benefits

(a) Better utilization of space

Employees are not the only ones who benefit from working from home; organization also benefit just as greatly by utilizing same office space for double the number of employees, increase productivity, and save money. This is very easy to implement where companies generally take projects of remote users. Similarly, the companies can get the work done using remote employees with added SVN facility to monitor the work.

(b) Better utilization of skills

Simon Slade, CEO and co-founder of Affilorama has experienced firsthand the benefits of having remote workers at his company, According to him, “By allowing employees to work remotely, you can hire the best of the best while not limiting yourself by geographical restrictions. And some time we need not hire them completely but take work and pay them”. Study shows that work from home gives same work satisfaction and performance. Instead organizations can save money as such employees use their own computer, electricity and other utilities. Opening the talent pool with freelance workers can become a big benefit with research and open source departments which allows the research to happen round the globe. Linux and other open source software are examples of this kind of products.

Companies might also retain more employees if they enact a work from home benefit. Nick Bloom, a Stanford professor, conducted a study to evaluate the benefits of working from home. He found workers were more productive, got more done, worked longer hours, took less breaks, and used less sick time than their in-office counterparts. These employees were also happier and quit less than those who went to office on a regular basis. He estimated that, on average, the company saved around $2,000 per employee who worked from home.

(c) Health Benefits

People who work from home travel less and hence face less stress in traffic. Travel cost is also saved by the employee and employer. They can have an easier time eating healthy and striking a manageable work-life balance. Eating healthier and having more time to spend with your family can help you feel less stressed, which will make for a happier more productive workday.

Managing work from home through technology

Companies are certainly catching onto the trend, and most of them are already giving the flexibility to work from home - at least when needed. Definitely in the fast growing market and technology and even banking facility on mobile, increased productivity can be measured with work from home option. With virtual team working, employees need not work at same place, or even at the same time, in order to work together. Consider the following options:

- employees work separately and keep in touch with employer and each other via email.
- **Same time, different place Different time, different place** - employees can communicate with each other in 'real time' through telephone conference calling, video-conferencing or using instant messaging.
- **Different time, same place** - employees can access your business network or databases by connecting to an intranet or extranet. A virtual private network is a more secure, but expensive, way of doing this.
- **Same time, same place** - even working from home, employees will still need to meet face-to-face occasionally. Email and electronic diaries allow to arrange meetings and transfer documents, while wireless technology allows to meet anywhere.
- **Any time, any place** - mobile phones and laptop computers with wireless internet access mean that employees are always accessible and can work wherever they are.

Security

Security and privacy of the data is the main issue. Antivirus and firewall and secured VPN connections would be an option but the workers should read and understand IT policies and know their information security responsibilities.

Employees who deal with sensitive information should be particularly careful about:

- **Safety of equipments at home**
- **Safely carrying equipment from one place to another and be aware of theft and misplacement due to negligence**
- **Working using public internet access may not be always secure**
- **Printout and other paper document related to work should not be thrown at public places without shredding them**

B. Flexibilty in timings (Working in shifts)

There have been many deliberations over the advantages and disadvantages of working in shifts for employer or the employee. A specific work is handled in shifts by different sets of crew working in shift relay which is how the work gets 24 hours exposure and coverage. For certain time sensitive tasks, such practices are beneficial in terms of employer's perspectives. For the employee it can mean liberty and convenience. However it can have many negative impacts too. Most of the bad impacts on employees are related to health. The main advantages

of working in shifts are convenience, reduced amount of working hours, training prospects; avoiding peak hour's traffic, pushing works to weekends and flexibility to leave.

1. Convenience:

Employees are able to choose the shift according to their needs. A person who needs to take care of home can opt for night shift and a person who is free in the morning can opt for morning shifts. At the same time it is beneficial when it comes to taking leave. The common morning shifts seems convenient however these days people choose for night or evening shifts because they get the liberty of time with such shifts. This is one of the benefits of working nights.

2. Reduced amount of working hours:

The working hours are less in shift works. In regular ordeal the work hours extend to overtime with the purpose of completion of tasks given. However in shift works becomes easier as the next crew to shift shall be handling the rest of the work thus no need of putting in extra hours.

3. Training prospects:

This is the best attribute of shift work. One gets opportunity to enhance his skills by working in shifts and managing time for the training without taking leave.

4. Avoid peak hours:

Morning shifts take most of the travelling time. Peak hours or rush hours travelling to work leads to stress, frustration and less concentration. Slight change in timing can make travelling flexible.

5. Pushing works to weekends:

Working in shifts allow completing important family chores during weak as they are not pending for the weekend. This leads to relaxed weekends which can be spent with family and friends leading to a balanced life

6. Flexibility of leave :

Instead of keeping option of leave only at weekend, one can request in the midweek and compensate for it later. It is easier as one can swap shifts with coworkers too.

Disadvantages of working in shifts are abnormal routine, shift inequality and safety.

1. Abnormal routine:

The pattern of sleep, wake up time and eating time is not the same for the shift workers. Night shift workers feel tired and lazy as they do not get enough amount of sleep during day time. Even the eating schedule changes for night shift employees. Shift workers have regular change in routine which is difficult for the body to adjust and sometimes he gets totally disconnected with social life. Lack of sleep reduces the ability to be attentive at work affecting productivity and even may lead to major accidents.

2. Shift inequality:

In some of the organizations, shifts are based on seniority and seniors get the best slot like the day shift and the rest of the employees get evening and night. This may result into imbalanced team with respect to experience and juniors do not get the advantage of working with seniors and learn from their experience.

3. Safety

This is the major concern of organizations specially with women workers as either they have to employ women workers in morning shift or carefully handle their safety in night shifts. Night shifts still prove risky for women out of the workplace premises.

C. Flexibility in skill

Employees who approach their job with a flexible mindset are typically more highly valued by employers. Flexibility on the job includes the willingness and ability to readily respond to changing circumstances and expectations. They never say "I don't know" or "I will not" they find opportunities to take new assignments and understand demands and situations.

In general organizations appoint people based on qualification and experience. But sometimes while working in an organization, employee learns new skills as per his area of interest and would like to work in the same area. Organizations should be flexible to allow him and utilize his skill set as such an employee is ready to take more responsibilities and ready to do more work. Performance management system should not value current performance of the employees, but provide them opportunities for their advancement of capabilities, skills and knowledge in upcoming times. This will inspire them for positive conduct towards work and organization. At the same time, this will make employees to react aggressively and effectively to their respective portfolio, ultimately leading to effective organizational performance (Galinsky, Sakai, & Wigton, 2011). An organization may develop skill flexibility through processes such as job-rotation, cross-functional teams, and project-based work arrangements, all of which generate broad skill configurations specific to the organization that are not easily replicable. Employees stick to the organization which adopt new technology, provide them training to increase their skill set.

Flexible Managers treat their employees as individuals and make an effort to accommodate personal styles and needs. They help them suggest the ways to achieve the goals and create a kind of relationship with the employee. They regularly motivate them and give recognition of their hard work

Optimize performance

Work satisfaction and family well-being give employees a level of control over their work arrangements[8]. Organizations that invest considerable time and money into training and developing their staff see it as good business to adopt policies that will attract and retain skilled personnel.

Employees who are interested in organizational citizenship behavior are bold and committed, work hard to meet organizational goal effectively, and have a need for developing innovative ideas in achieving organizational innovation (Yang & Konard, 2011). Hence organizational creativity and adopting to new technology relates to organizational citizenship behavior that is instrumental in achieving competitive advantage. The organizational citizenship behavior is the outcome of organization's human resource system. Thus, the association between human resource flexibility and organizational citizenship is likely to have a positive influence on organization..

Relationships between human resource flexibility and job satisfaction produces (a) Employees with part-time contracts by employers' decision will have lower levels of job satisfaction than employees with full-time contracts, (b) As higher is the flexibility in the working schedule, higher will be the level job satisfaction, and (iii) Workers on shift contracts have a lower level of job satisfaction than those who does not work on shifts.

Conclusion

Human resources flexibility has an important effect on job satisfaction. The human resources department and the whole organizations should take into consideration when they decide the HR policies. Flexibility in the workplace will continue to become more important for both men and women. However, with the advent of new technologies, workplaces develop strategies that enable and encourage flexibility for those with family responsibilities, the needs of those with other commitments, including sport, community or political involvement, other business and even recreational pursuits, will also be able to be accommodated. This flexibility will be significant advantage for older employees at the workforce just as it has been associated with more women actively engaging in the workforce.

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Antecedents of School Branding: A School Leaders' View to Develop School Branding Model

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Abstract

Branding is a process to communicate with the prospective consumers about the features, attributes, characteristics and benefits of the product and service. Branding of k-12 schools, especially in developing countries is quite unique in nature as it encompasses both tangible and intangible aspects. There are several parameters which impact the school branding and hence school-choice criteria of the parents. This paper explores the linkages and hierarchy of these parameters impacting the overall school brand from school leaders' perspective.Focus Group Discussions (FGDs) are conducted to identify school branding parameters along with inputs from the existing literature. Total Interpretive Structural Modelling (TISM) is used to create hierarchical model among the factors and interpret the linkages and cross-linkages between them.Hierarchical model of school branding parameters is developed as perceived by the school leaders. This model along with the similar model from parents can be utilized by schools to bridge the brand gap and develop an effective school brand.

Keywords: Branding, K-12 Schools, Total Interpretive Structural Modelling (TISM), School-choice criteria

Introduction

Brand is not a new concept; it has existed since ancient times when potters used to make their products with their initials (Hieronymus and Dirim 2003) and farmers used to put mark on their cattle to differentiate them from competitors (Keller 2009). American Marketing Association defines brand as "A name, term, symbol or design, or a combination of them, which is intended to signify the goods or services of one seller or group of sellers and to differentiate them from those of competitors." Brand creates awareness, reputation and niche for the product in market place (Keller 2009). Brand has the ability to bring back certain attributes and features associated

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with the product to the mind of the customers. Brands, thus act as the differentiator from the local products as well as from competitor's product (Aaker 1996). Thus brand can be described as a bouquet of values that enables a promise about the unique and differentiated experience (De Chernatony 2001). Brand is a promise of the bundle of attributes; these attributes can be real or imaginary, rational or emotional, tangible or intangible (Ambler and Styles 1992). The brand encompasses both tangible product related values as well as intangible characteristics (added value) (Aaker 1996).

Brands are seen as symbols with personalities that users relate to the product and services being offered beyond the offered functional utility (Alt and Griggs 1988; Arnold 1992; Goodyear 1993). Brand is a symbol which in itself encompasses variety of ideas and attributes (Gardner and Levy 1955). The stronger and clearer message these symbols carry, more trust is developed in consumers (Dawar and Parker 1992). The impact of branding process increases significantly if the information carried by these signals and symbols is more accurate and closer to the actual attributes and features of the product (Leischnig et al. 2012).

The identification of the true quality of the product and services being offered is too cumbersome a process for the customers and also involves huge amount of purchase risk (Jacoby et al. 1971). The purchase risk can be of numerous type i.e. financial risk, time risk, social risk, physical risk etc. (Swait and Ardem 2003). Due to lack of readily available information and high risk involved in actually purchasing the product, the customers rely on signals provided by brands to gauge the quality of product and service being offered (Rao and Monroe 1988). The purchase risk involved at the time of choosing a school for their child is very high. Thus, parents seek these signals to gauge the quality of the school, as an outsider with limited availability of information judging the actual school quality is very difficult (Jacoby et al. 1971; Scheneider and Buckley 2002). The signals that schools send out through branding process can be tangible as well as intangible. Tangible signals include infrastructure, academic results of the school, transport etc. Intangible signals can be teacher quality, imagery of the school, word of mouth etc.

School education has this peculiar distinction of providing both tangible as well as intangible services. In the end school is offering a service, 'education' as service differentiates from product, such that the ownership does not change hands (Lovelock and Wirtz 2011). But the antecedents of the school brand are both, the tangible product (infrastructure) as well as the intangible service (education). The efficacy of the service offered by the school i.e. education can only be gauged after the completion of schooling (post-consumption) (Chen 2008). Brand is not a stand-alone attribute, it is the sum total of various aspects like attributes, features, experience, communication, positioning etc. (Jobber and O'Reilly 2011; King 1991). Similarly school brand is a sum total of infrastructure, academic performance, systems & processes, teacher and staff quality, culture etc.

Traditionally parents have wanted their children to get educated, have a stable income and build a career. In order to provide all this to their children they tend to push their child to the best (branded) preparatory and secondary school, followed by education from a reputed university (Napompech 2011). Brand in itself is not a standalone attribute; it is an amalgamation of features, communication, positioning, experience etc. (Jobber 2011; King 1991). Similarly the school brand is a function of infrastructure, teacher quality, marketing, academic results etc.

Problem Definition

A good school brand not only attracts quality students but also attracts and helps in retaining quality teachers. The schools in developed countries are largely state-run and branding primarily

becomes a function of results of the school, as other variables like infrastructure, curriculum, extracurricular activities etc. are pretty standardized. On the contrary in Indian context the quality schools i.e. top ranked schools (Education World, Outlook surveys) are primarily the private schools; school administrators in the government run schools does not have much say in revamping the infrastructure, faculty and student selection etc. The private schools want to attract best talent which is a function of the school brand, however, the literature on the antecedents of school branding in context of developing countries in general and India in particular is very scant. This paper attempts to identify the factors contributing to the school brand and to explore the linkages among those factors.

Research Methodology

Focus Group Discussions were conducted to identify the factors that contribute to the overall brand of the school. The factors identified were designed in the form of a structured questionnaire to seek responses from the experts on the impact of one factor on other and vice-versa. Total of 11 responses were received on the questionnaire and the data collected through the questionnaire was used to identify the inter-linkages among the factors.

Focus Group Discussions (FGDs) were conducted to identify the factors that drive the school brand. These discussions were conducted with school principals and administrators i.e. stakeholders who are the decision makers in the brand building activities from the school end. Four FGDs were conducted comprising of 10 participants each at 4 different locations i.e. Delhi, Muzaffarnagar, Kolkata and Coimbatore. Each FGD lasted for 45-60 mins. The discussions were moderated by an expert from the education sector and the techniques used were direct open questioning by the moderator at the beginning of the discussion followed by self-administered questioning between the participants, with occasional moderating from the moderator to direct the group towards the set goals of the FGD.

The key questions that were open for the group to discuss were:

1. Is branding important for k-12 schools
2. What are the elements of school ecosystem that contribute/impact the school brand

1. Is branding important for k-12 schools

Majority of the participants were of the opinion that branding is important for k-12 schools. They opined that the branding is/should be one of the focus areas of the school. A school should focus on the activities that create a positive brand image in the minds of the customers (parents) and society. Depending on the vision and mission of the school, a school can focus on the brand image that they want to create for themselves.

"*School brand is the name that school earns over a period of time"*

"Parents do look at brand image of the school before sending their child to a particular school"

"A good school brand helps in attracting good students as well as good teachers"

"School brand is created over a period of time by doing right things right"

Few participants were of the opinion that branding is not something that a school can control or should focus upon, it happens on its own as a school focuses on academics, extracurricular, build infrastructure; branding happens on its own. However, others opined and argued that knowingly or unknowingly these activities do develop a certain brand image of the school, and if right things are done in the right manner than schools can create the desired brand image for themselves.

2. What are the elements of school ecosystem that contribute/impact the school brand

Participants in all the groups had long discussions on the elements of school branding, there were numerous aspects that came up from the discussions. Majority opined that the schools' performance in the board results and number of selections in the competitive examinations were the key elements, whereas there were substantive number of participants who opined that the extra-curricular and co-curricular activities along with the international tie-ups is important for the overall branding of the school as now days parents also focus on the holistic development of the child and see these aspects as antecedents to an all-round development. The major elements that emerged out of discussions were following:

- **Academic Performance**: this element included both board examination results as well as the performance of the students in various competitive examinations like IITJEE, Medical entrance and law entrance examinations.

  "Academic performance of children is an indicator of the quality of education imparted by the school. It also reflects the quality of leadership and teachers in the school"

  "Academic performance is a key driver of schools' brand image, other aspects can be an add on, but academic performance remains at the core of the school brand"

- **Physical Infrastructure**: this element comprised of the infrastructure available at the school i.e. how big is the overall school, what type of school building is there, what are the various labs that are available in the school and their corresponding infrastructure, playground size and various sports facilities etc.

  "Having good physical infrastructure in place is a prerequisite for the quality education nowadays"

  "Physical infrastructure is the first interface of the school with the parents and society, and hence plays a vital role in the overall brand development of the school"

- **Extra and Co-curricular activities**: what are the extra-curricular and co-curricular activities that the child is subjected to in the school, what is the infrastructure available to undertake those activities

  "Extra and co-curricular activities aids the overall learning of the child and improves all round performance in academics as well as in other activities"

  "Extra and co-curricular activities have emerged as key factors in the holistic development of the child. There are schools who wants to be seen as the ones focusing majorly on the extra-curricular activities. A set of parents are also seeking schools that focus on other aspects of learning than the academics, with a belief that it will prepare them for a challenges in life"

- **Information Technology (IT) Infrastructure**: this element included the information technology infrastructure such as smart classes, online presence, mobile/internet connectivity with the parents, how much real time data can be shared with the parents and how to keep them in loop with continuous information sharing to complete the feedback system.

  "With almost every parent having access to internet at home or through phone they want information about child's progress on the go"

  "Parents come to school and say that they want their ward's marks and other details on phone, through internet or message, as other 'good' schools are doing so"

- **Teacher and Staff Quality**: the groups opined that the quality of teachers and the support staff is one of the key elements in developing a strong school brand. It is the quality of the teachers that impacts the performance of the students, and in turn the teacher quality is impacted by their own skillsets along with the support they get from the school.

  "Quality of education in a school cannot exceed quality of teachers and the support staff"

  "Quality teachers develop quality students and hence the brand of the school"

  "Brand of a school is hugely impacted by the teacher quality and leadership (head of the school)"

- **Marketing and Promotion**: this element focused on the promotional activities that the school does to brand itself. Various activities were mentioned by the participants that comprise this element i.e. notice boards, hoardings, cultural/academic events etc.

  "Apart from academics and the holistic development, marketing and promotion activities help in creating a strong school brand"

  "Doing right things right is not enough, the good work done by the school needs to be spread to all stakeholders (parents, children, society and media) to create a positive brand image of the school"

Interpretive Structural Modelling (ISM) is a process of formulating mental models into well-defined visible models encompassing multiple viewpoints and bringing subjectivity to the model (Warfield 1974; Sage 1977). ISM is based on hierarchy and establishes relationship between multiple elements (Warfield 1976). ISM is a strong modelling tool, however the interpretation of links established between components is comparatively weak. Interpretation is ISM is restricted to relationship between elements and direction of relationships in paired comparisons. Total Interpretive Structural Modelling (TISM) incorporates interpretation of links in ISM (Sushil, 2012), thus making the structured model interpretative and open to interpretative logic at each relation (Sushil, 2005). TISM makes a model more transparent by interpreting every logical relation; instead of leaving it open for multiple interpretations. TISM interprets both nodes as well as links in the structural developed model.

TISM Development

Step 1: Identifying the key elements

Identifying the elements impacting the overall school brand. The elements of school branding model has been identified using Focus Group Discussions (FGDs).

Step 2: Define contextual relationship between elements

Defining contextual relationship is an integral part of TISM to structure themodel relating various elements. The contextual relationship explores relations between identified factors i.e. "Factor X will influence/enhance factor Y". For example, "Extra-curricular activities will influence/enhance Academic performance".

Step 3: Interpreting Relationships

This step gives TISM an edge over ISM as this seeks interpretation of the relationships. The key issue explored here is "In what ways factor X will influence/enhance factor Y"

Step 4: Interpretive logic of pair-wise comparison

Interpretive knowledge base is created by conducting a pair-wise comparison of the elements,

thus establishing the relationship between the elements. The response to each comparison can be either Yes (Y) or No (N). Directional relationships are established among elements in this step. If the response to the relationship is Yes (Y), it is further explored.

Step 5: Reachability matrix and transitivity check

The reachability matrix is prepared by putting 1 for 'Yes' and 0 for 'No' from the pair-wise comparison in previous step. Further the matrix is checked for transitivity (if X-Y and Y-Z, then X-Z). For each transitive link established the reachability matrix is updated with 1 (Yes), and the interpretation column is updated with 'transitive'. If some meaningful relation can be established then it is written along with transitive entry.

Table 1: Reachability Matrix

	C1	C2	C3	C4	C5	C6	C7
C1	1	1	0	1	0	0	0
C2	1	1	0	1	0	0	0
C3	0	0	1	0	0	1	1
C4	0	0	0	1	0	0	0
C5	0	0	0	0	1	1	0
C6	0	0	0	0	1	1	0
C7	0	0	1	0	0	0	1

Table 2: Post-iterative matrix

	C1	C2	C3	C4	C5	C6	C7
C1	1	1	0	1	0	0	0
C2	1	1	0	1	0	0	0
C3	0	0	1	0	0	1	1
C4	0	0	0	1	0	0	0
C5	1	0	0	0	1	1	0
C6	1	0	0	1	1	1	0
C7	0	0	1	0	0	1	1

Step 6: Level partition on Reachability Matrix

Level partition in TISM is carried out in the similar manner as in ISM. This step helps in identification of placement of elements level-wise (Warfield 1974; Saxena et al. 2006). The

elements in the top level of the reachability matrix will consist of the element itself and other items that lie within the same level.

Step 7: Developing Diagraph

All elements are arranged graphically as per the relationship in the reachability matrix. The information from the interpretive knowledge base is examined to revise the transitive relationships between the elements. Only those transitive relationships are retained whose interpretation emerge out to be crucial in the overall model.

Step 8: Interaction Matrix

Diagraph is converted into an interaction matrix using 1's to indicate direct and significant transitive links. Further interpretations are drawn from the interpretive knowledge base to develop an interaction matrix.

Table 3: Partitioning Matrix (Iteration 1)

	Reachability	Antecedent	Intersection	Level
C1	1, 2, 4	1, 2, 5, 6		
C2	1, 2, 4	1, 2		
C3	3, 6, 7	3, 7		
C4	4	1, 2, 4, 6	4	**I**
C5	1, 5, 6	5, 6		
C6	1, 4, 5, 6	3, 5, 6		
C7	1, 3, 6, 7	3, 7		

Table 4: Partitioning Matrix (Iteration 2)

	Reachability	Antecedent	Intersection	Level
C1	1, 2	1, 2, 5, 6	1, 2	**II**
C2	1, 2	1, 2	1, 2	**II**
C3	3, 6, 7	3, 7		
C5	1, 5, 6	5, 6		
C6	1, 5, 6	3, 5, 6		
C7	1, 3, 6, 7	3, 7		

Table 5: Partitioning Matrix (Iteration 3)

	Reachability	Antecedent	Intersection	Level
C3	3, 6, 7	3, 7		
C5	5, 6	5, 6	5, 6	**III**
C6	5, 6	3, 5, 6	5, 6	**III**
C7	3, 6, 7	3, 7		

Table 6: Partitioning Matrix (Iteration 4)

	Reachability	Antecedent	Intersection	Level
C3	3, 7	3, 7	3, 7	**IV**
C7	3, 7	3, 7	7	**IV**

Table 7: Interaction Matrix

	Teacher and Staff Quality	Physical Infrastructure	Extra and Co-curricular Activities	Overall Brand of School	Academic Performance	Marketing and Promotion	IT Infrastructure
Teacher and Staff Quality	X	1	0	1	0	0	0
Physical Infrastructure	1	X	0	1	0	0	0
Extra and Co-curricular Activities	0	0	X	0	0	1	1
Overall Brand of School	0	0	0	X	0	0	0
Academic Performance	1*	0	0	0	X	1	0
Marketing and Promotion	1*	0	0	1*	1	X	0
IT Infrastructure	0	0	1	0	0	1*	X

Direct Link

Significant Transitive Link

Step 9: Total Interpretive Structural Modelling (TISM)

The connective information derived from the diagraph and interpretive information from the interpretive knowledge base is utilized to come up with Total Interpretive Structural Modelling (TISM). Interpretations are shown as the directive links between the nodes which are formed by the proposed elements in a hierarchical structure as identified by the model.

Table 8: Interaction Matrix (Interpretive Matrix)

	Academic Performance	Teacher and Staff Quality	Physical Infrastructure	Overall Brand of School	Marketing and Promotion	Extra and Co-curricular Activities	IT Infrastructure
Academic Performance	X	Academically strong school attracts better teachers	0	Board Results and IITJEE Medical Selections	0	0	0
Teacher and Staff Quality	Better teachers lead to better results	X	0	Teaching Pedagogy	0		0
Physical Infrastructure	1	0	X	1	Tangible Infrastructure enhances Marketing efforts	Infrastructure boosts EC activities	Smart Classes and ERP
Overall Brand of School	0	0	0	X	0	0	0
Marketing and Promotion	Marketing and promotion pushes schools to put impetus on Academic results	0	0	1	X	Marketing efforts pushes schools to introduce more Extra and Co-curricular activities	0
Extra and Co-curricular Activities	Holistic development and positive impact on Academics	0	0	Parents consider schools focusing on holistic development as better brands	Extra and Co-curricular activities enhances the marketing pitch	X	0
IT Infrastructure	1	0	Directly Relevant	1		1	X

Direct Link
Significant Transitive Link

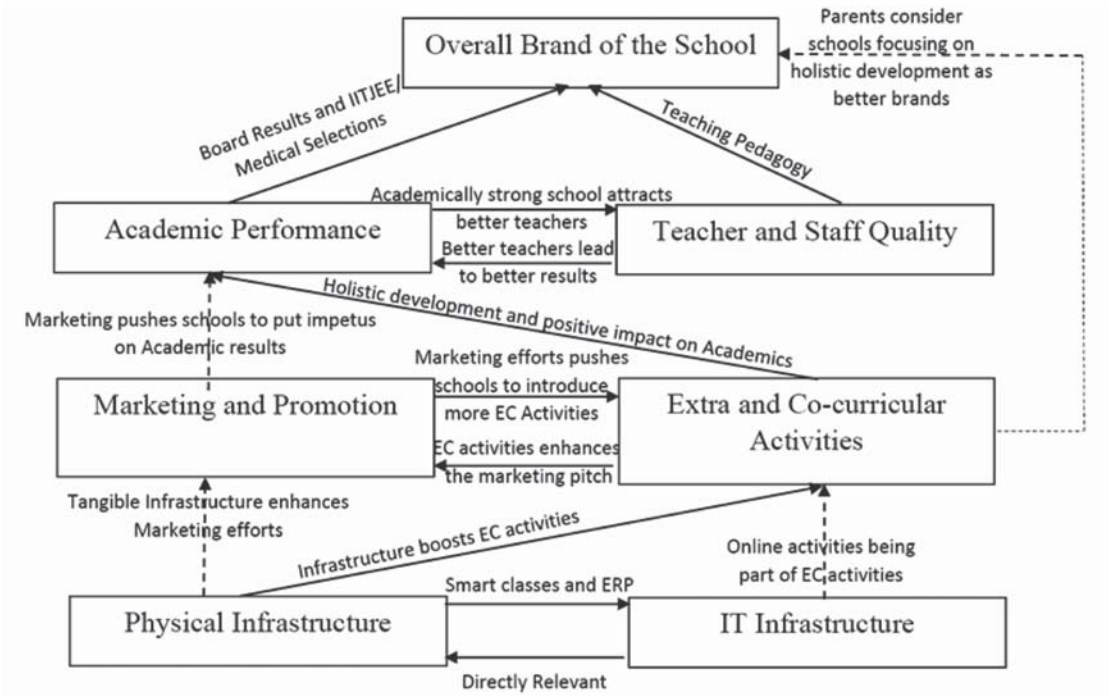


Figure 1: TISM Model for School Brand Development

Findings and Conclusions

This paper explores various factors that contribute towards the branding of k-12 schools in India. Focus group discussions among the experts i.e. school principals and owners with more than 10 years of experience in the leadership role, were conducted. Six factors emerged from the focus group discussions, whose impact on the overall brand of the school has been identified in this paper. Further the linkages among these factors were identified using Total Interpretive Structural Modelling. Academics was found to be directly impacting the overall brand of the school, indicating that the board exam results and the number of selections in the IITJEE and Medical competitive examinations impacts the school brand favourably. Also Infrastructure (both physical and IT) was identified aspre-requisites for developing a school brand. The tangibility of the school brand arises from the quality of the infrastructure. Also the Information Technology related infrastructure i.e. Smart Class rooms and ERP systems were found to be impacting the brand image of the school positively. Extra and co-curricular activities were found to have a significant transitive impact on the academic performance of the school, indicating that contrary to the general belief, extra and co-curricular activities positively impacts the academic performance too. Marketing and promotion efforts by the school were identified to be significantly linked to both Physical Infrastructure and Extra & Co-curricular activities. Teacher and staff quality evidently has direct impact on the overall brand of the school as well as significant direct impact on the Academic performance of the school.

Schools can use the proposed model to brand themselves as the preferred brand among the parents, with focusing on the broad factors and understanding their inter-linkages. Findings like impact of extra and co-curricular activities on the academic performance of the school along with the impact of teacher and staff quality can be used to improve academic performance of the school and hence develop and enhance overall brand of the school.

Appendix I: Interpretive logic-knowledge base questionnaire

S. No.	Element Nos.	Element Statement	Y/N	Brief Explanation
1	C1-C2	Academic Performance will influence or improve Teacher and Staff Quality		
2	C2-C1	Teacher and Staff Quality will influence or improve Academic Performance		
3	C1-C3	Academic Performance will influence or improve Physical Infrastructure		
4	C3-C1	Physical Infrastructure will influence or improve Academic Performance		
5	C1-C4	Academic Performance will influence or improve Overall Brand of the School		
6	C4-C1	Overall Brand of the School will influence or improve Academic Performance		
7	C1-C5	Academic Performance will influence or improve Marketing and Promotion		
8	C5-C1	Marketing and Promotion will influence or improve Academic Performance		
9	C1-C6	Academic Performance will influence or improve Extra and Co-curricular Activities		
10	C6-C1	Extra and Co-curricular Activities will influence or improve Academic Performance		
11	C1-C7	Academic Performance will influence or improve IT Infrastructure		
12	C7-C1	IT Infrastructure will influence or improve Academic Performance		
13	C2-C3	Teacher and Staff Quality will influence or improve Physical Infrastructure		
14	C3-C2	Physical Infrastructure will influence or improve Teacher and Staff Quality		
15	C2-C4	Teacher and Staff Quality will influence or improve Overall Brand of the School		
16	C4-C2	Overall Brand of the School will influence or improve Teacher and Staff Quality		
17	C2-C5	Teacher and Staff Quality will influence or improve Marketing and Promotion		
18	C5-C2	Marketing and Promotion will influence or improve Teacher and Staff Quality		
19	C2-C6	Teacher and Staff Quality will influence or improve Extra and Co-curricular Activities		
20	C6-C2	Extra and Co-curricular Activities will influence or improve Teacher and Staff Quality		
21	C2-C7	Teacher and Staff Quality will influence or improve IT Infrastructure		
22	C7-C2	IT Infrastructure will influence or improve Teacher and Staff Quality		
23	C3-C4	Physical Infrastructure will influence or improve Overall Brand of the School		
24	C4-C3	Overall Brand of the School will influence or improve Physical Infrastructure		
25	C3-C5	Physical Infrastructure will influence or improve Marketing and Promotion		
26	C5-C3	Marketing and Promotion will influence or improve Physical Infrastructure		

27	C3-C6	Physical Infrastructure will influence or improve Extra and Co-curricular Activities		
28	C6-C3	Extra and Co-curricular Activities will influence or improve Physical Infrastructure		
29	C3-C7	Physical Infrastructure will influence or improve IT Infrastructure		
30	C7-C3	IT Infrastructure will influence or improve Physical Infrastructure		
31	C4-C5	Overall Brand of the School will influence or improve Marketing and Promotion		
32	C5-C4	Marketing and Promotion will influence or improve Overall Brand of the School		
33	C4-C6	Overall Brand of the School will influence or improve Extra and Co-curricular Activities		
34	C6-C4	Extra and Co-curricular Activities will influence or improve Overall Brand of the School		
35	C4-C7	Overall Brand of the School will influence or improve IT Infrastructure		
36	C7-C4	IT Infrastructure will influence or improve Overall Brand of the School		
37	C5-C6	Marketing and Promotion will influence or improve Extra and Co-curricular Activities		
38	C6-C5	Extra and Co-curricular Activities will influence or improve Marketing and Promotion		
39	C5-C7	Marketing and Promotion will influence or improve IT Infrastructure		
40	C7-C5	IT Infrastructure will influence or improve Marketing and Promotion		
41	C6-C7	Extra and Co-curricular Activities will influence or improve IT Infrastructure		
42	C7-C6	IT Infrastructure will influence or improve Extra and Co-curricular Activities		

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Effect of Brand Loyalty on Brand Equity: The Mediating Role of Brand Extension

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Abstract

Brand loyal customers are fundamental for the growth of any firm. Every marketer strives to attain a large base of loyal customers. Brand loyalty helps in enhancing brand equity; it also affects the attitude of consumer towards brand extension. The understanding of brand equity helps to gather the reason of dominance enjoyed by the known brands in the market; therefore brand equity is a key concept in branding and has been studied with the help of diverse approaches. The study has proposed a framework to understand the impact of brand loyalty on brand equity and further the effect of brand equity on the purchase intention of the customers. It has also identified the mediating role of attitude towards brand extension with respect to brand equity. Research design utilized is cross sectional in nature and non probability sampling is used to gather data from Delhi/NCR region. Since the study has taken brand extension as a mediating variable, the findings of the study are crucial for the literature in the aforesaid subject.

Keywords: Brand Equity, Brand Extension, Brand Loyalty, Purchase Intention

Introduction

Researches done in the area of branding provides vital inputs to marketers it helps them to strategize their actions for the decisions related to brand. It has been identified that brand equity gives value to the brand and helps the customer to recognize a particular brand in the clutter of several competitors. Marketers use several strategies to strengthen brand equity; one of them is brand extension which helps firms to explore new segments and markets. Brand extension is practiced by almost every marketer after getting itself established in the market. Marketers today have realized that it's important to grab a significant and visible position in market and for extension into new product categories can help to gain sustainability in market share.

Literature Review and Theoretical Framework

Brand Loyalty

Brand loyalty refers to the tendency to consider a particular brand as a primary choice (Yoo and Donthu, 2001).The phenomenon related to brand loyalty was first discussed by Copeland (1923), he called this occurrence as "Brand insistence", further to it the consistencies in the

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purchasing patter were observed by Cunningham (1956) and he defined it as brand loyalty. It is an important element for evaluating the brand since it helps in generation of profits for a firm (Aaker, 1991). Brand loyalty influences customer decision to purchase the same brand and refuse to accept competitors brand (Yoo, 2000). Brand loyalty helps to provide value to the brand and thus influences brand equity.

Brand Extension

Brand extension is a strategy which helps in utilization of credibility of the brand and it lowers the costs associated with advertising (Joshi and Yadav, 2017). In a highly competitive market introduction of new brand is difficult and it requires resources in the form of time and money. Managers therefore, choose to use well known and established brand names with specific associations. Consumer evaluation of the brand extension changes the associations of the parent brand and such evaluation if positive will enhance the brand equity of the core brand (Dwivedi, Merrilees, & Sweeney, 2010).

Brand Equity

Brand equity is an important concept for the researchers, it has been viewed from two different perspectives - customer based brand equity and financial brand equity. Financial brand equity is defined with the help of stock value of the brand and not much emphasized in studies. Customer based brand equity is subject matter of various researches since 1990's. In the existing literature it has been defined with the help of different constructs i.e. brand loyalty, brand association, brand awareness, perceived quality and other proprietary assets (Aaker, 1991), the added value endowed by the brand name (Farquhar et al., 1991), brand knowledge such as brand awareness and brand associations (Keller, 1993). Keller (1993) and Aaker (1991, 1996) have collectively defined four dimensions of brand equity i.e. brand loyalty, brand awareness, perceived quality of brand, and brand associations, as proposed by Aaker and Keller (1993). Judgment of an individual about purchasing a designated brand is one of the most important behavioural consequences of brand equity (Aaker 1991 & Chang and Lui 2009).

Purchase Intention

Probability of the buying intention of a consumer for a particular brand is defined as purchase intention (Grewal, Monroe, and Krishnan, 1998). It is the likelihood on the basis of interaction between needs of customer, perception and attitude towards the brand or product (O'Cass and Lim, 2002). The goal of all form of marketing communication is to create the intention purchase the marketed product (Keller, 2008; Kapferer, 2008). High brand equity promotes brand preference and therefore stimulates purchase intention (Cobb-Walgren et al., 1995).

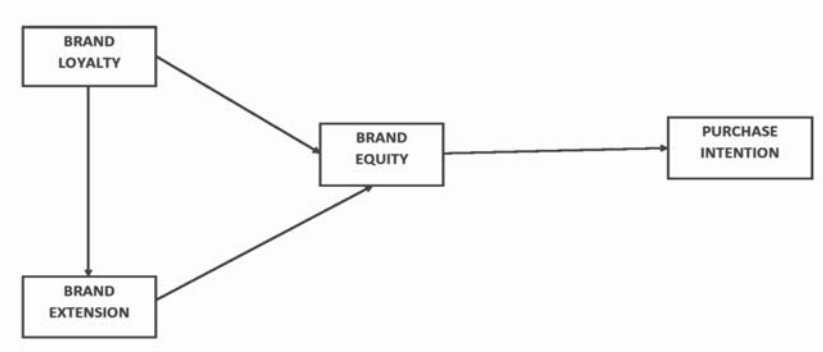


Figure 1: Framework of the study

Research Hypotheses

On the basis of existing literature, we have proposed a framework (Figure 1) and following hypotheses are developed –

H1: Brand loyalty has direct positive effect on brand equity.

H2: The effect of brand loyalty on brand equity is mediated (indirect effect) by brand extension.

H2a: Brand loyalty has direct positive effect on brand extension.

H2b: Brand extension has direct positive effect on Brand Equity.

H3: Brand equity has direct positive effect on purchase intention.

Research Methodology

Research Design: Research Design is cross sectional in nature which involves the collection of information from any given sample of population only once (Malhotra and Dash, 2016). The data for this research has been collected through online mediums. E-copies of questionnaire were prepared through Google docs and they were circulated via emails and facebook to the respondents.

Stimulus: The stimulus for the study is real apparel brand BIBA and its latest brand extension in the category of jewellery called BIBA jewellery. The extension is launched in October 2017. The price of jewellery is starting from 299. It is a famous ethnic clothing brand for women.

Respondents: The respondents are working women chosen through Snowball Sampling covering different sectors like IT industry, Education, BPOs/KPOs etc. The sample size is of 371 respondents.

Instrument and Measures

Scales used in the study has been formed by revisiting the existing scales in the available literature of relevant area. Three items for brand loyalty are taken from Ailawadi et al. (2001). Brand equity is measured with the help of three items taken from Yoo and Donthu (2001). Brand extension is measure by taking two items from Dwivedi Abhishek (2010) and one item from Keller and Aaker (1992). Three items are used to measure purchase intention are taken from Shukla (2010).

Data Analysis

Outliers and Normality: Mahalanobis distance (D2) is calculated for each case. The result doesn't indicate any major deviation from the regular pattern or distinction of any case at large. This clearly indicated the absence of multivariate outliers (Byrne, 2010). Skewness and kurtosis values for variables were within range of $\pm$ 1 (Ranaweera and Prabhu, 2003) therefore no such deviation from normality is observed .

Construct reliability and validity

Reliability of scale is assessed through values of cronbach alpha and composite reliability. Table 1 indicates cronbach alpha values of brand loyalty, brand equity, brand extension and purchase intention i.e.835,.851,.890 and .817 respectively. All the values are above the recommended level of 0.7 (Hair, et al., 2013) and (Garver and Mentzer's, 1999). Table 2 shows the average variance extracted values of all the four variables the values lie above 0.5 this shows convergent validity is established. The values of MSV (maximum shared variance) are less than AVE (average variance extracted) this indicates discriminant validity is established (Hair, et al., 2013).The square-root of AVE for a given construct is greater than the absolute

value of standardised correlation of the given construct with all other constructs. It shows discriminant validity is also established (Fornell and Larcker, 1981).

Table 1: Factors used in the study

Construct/ Items	Source	Cronbach Alpha
Brand Loyalty		.835
I would rather stick with a biba brand I usually buy than try something I am not very sure of	Ailawadi et al. (2001)	
I consider myself to be loyal to biba	Ailawadi et al. (2001)	
I feel confidence in brand biba that I always buy	Ailawadi et al. (2001)	
Brand Equity		.851
Even if another brand has the same features as biba, I would prefer to buy biba. (1 strongly disagree to 7 strongly agree)	Yoo and Donthu (2001)	
If there is another brand as good as biba, I prefer to buy biba. (1 strongly disagree to 7 strongly agree)	Yoo and Donthu (2001)	
If another brand is not different from biba in any way, it seems smarter to purchase biba. (1 strongly disagree to 7 strongly agree)	Yoo and Donthu (2001)	
Brand Extension		.890
I am very positive to extension biba jewellery.(1 strongly disagree to 7 strongly agree)	Keller and Aaker (1992)	
According to me extension biba jewellery is great.(1 strongly disagree to 7 strongly agree)	Dwivedi Abhishek (2010)	
I admire extension biba jewellery a lot.(1 strongly disagree to 7 strongly agree)	Dwivedi Abhishek (2010)	
Purchase Intention		
I would buy biba rather than any other brands available	Shukla (2010)	.817
I am willing to recommend others to buy biba	Shukla (2010)	
I intend to purchase biba in the future	Shukla (2010)	

Table 2: Statistical results

	CR	AVE	MSV	ASV	BEQ	BL	BE	P
BEQ	0.854	0.594	0.342	0.200	0.770			
BL	0.837	0.633	0.154	0.129	0.393	0.795		
BE	0.900	0.751	0.342	0.175	0.585	0.341	0.867	
P	0.839	0.647	0.117	0.096	0.320	0.342	0.260	0.805

Indices: CR= Composite Reliability, AVE = Average Variance Extracted

Measurement Model Results

The measurement model indicates the GFI - .942 and CFI-.958 this indicates that the model is good fit (Hair et. al, 2013). Badness of it is measured using RMSEA the value for RMSEA is .07 which lies in the acceptable range of .03 to .08 (Hair et. al, 2013).

Table 3: Hypothesis testing

Direct relationship tested	P value	Results
Brand loyalty ⟶ Brand Extension	.001	Significant
Brand loyalty ⟶ Brand Equity	.001	Significant
Brand Extension ⟶ Brand Equity	.001	Significant
Brand Equity ⟶ Purchase Intention	.001	Significant

Table 4: Indirect relationship test

Indirect relationship tested	P value	Results
Brand Loyalty ⟶ Brand Extension ⟶ Brand equity	.000	Significant

Table 3 & 4 shows the path estimates of both direct and indirect relationships which are tested. Table 3 shows the direct relationship of brand loyalty and brand extension is significant i.e. brand loyalty does affect brand extension positively since $p<0.05$ therefore H1 is accepted. Brand loyalty has direct positive affect on brand extension since $p<0.05$ hence H2a is also accepted. Brand extension positively affect brand equity since $p<0.05$ therefore H2b is also accepted. The affect of brand equity on purchase intention is also positive and significant since the $p<0.05$ hence H3 is also accepted. Since direct and indirect effects both are significant the mediation model is partial mediation model.

Discussions and Implications

The research has expanded the existing literature in the area of branding. The frameworks discussed in available literature has focussed on factors which are relevant for brand extension and the effects of brand extension on brand equity are examined , but the role of brand extension as a mediating variable with the important dimensions of brand equity i.e. brand loyalty are not analyzed till now. Also the studies have focussed more on brand extensions in FMCG market,

the latest extension of apparel brand called BIBA has reinforced that brand extension is a successful strategy for clothing brands too.

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pp. 511-522

Channel Collaboration in E-Commerce: A Study on Channel Relationship from the Perspective of Vendors Selling on Online Platforms: The E-Retailers

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Abstract

Channel collaboration has always played a pivotal role in value creation in any distribution supply chain. Marketers today,are exploring all possibilities of inter or intra organizational collaborations with the sole objective of creating customer value. One such collaboration which has transcended all business boundaries and is changing the very landscape of the business in the twenty first century is that of e-commerce. Fuelled by convergence of communication and information technologies, e-commerce has come about as an important distribution channel which firms no longer can ignore. According to an Ernst &Young report, the Indian e-commerce market is pegged to reach a staggering US $35bn by 2020. Amazon Flipkart, Snapdeal and many others have collaborated with a huge set sellers/vendors across the country for supplying goods and services.Amazon and Flipkart have more than 1,00,000 registered sellers in January 2017!!In this context, this research paper attempts to investigate the nature of collaboration between the sellers and the online portals and analyse the important elements of their channel relationship which positively influence trust, satisfaction and creates value for all its stakeholders.

Keywords: Electronic distribution channel, channel collaboration, e-retailers, sellers, vendor relationship management.

Introduction

Information technology is now the backbone of any firm's strategic infrastructure. Managers are now looking up and increasingly paying attention to the amazing role information technology can play in linking firms to their suppliers and their distribution chains. Electronic Commerce is one such avenue which is gaining immense popularity not just with consumers but also sellers and e-retailers Some shop online, others make payments of their bills and some transfer money via electronic medium. E-commerce in India is witnessing an unprecedented growth, particularly in the last five years. Consider this, Amazon has pumped in another Rs 2,900 crore into Amazon Seller Services, making its single-biggest infusion into its India market place in the year when rival Flipkart garnerednearly $4 billion (about Rs26,180crore)in funding. Amazon's third capital infusion into its India business this year takes its total investment in Amazon Seller Services to Rs 17,840 crore ($2.6 billion), more than double Flipkart's Rs 8,349 crore investment so far in its marketplace. (Economic times, Nov 2017. Amazon Seller Services will also be increasing the authorized share capital from Rs 16,000 crore to Rs 31,000 crore or $4.7

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billion. The move indicates that including the investment in other units like cloud services and payments business, the Seattle-based online retail giant is expected to go past investment commitment of $5 billion in India.

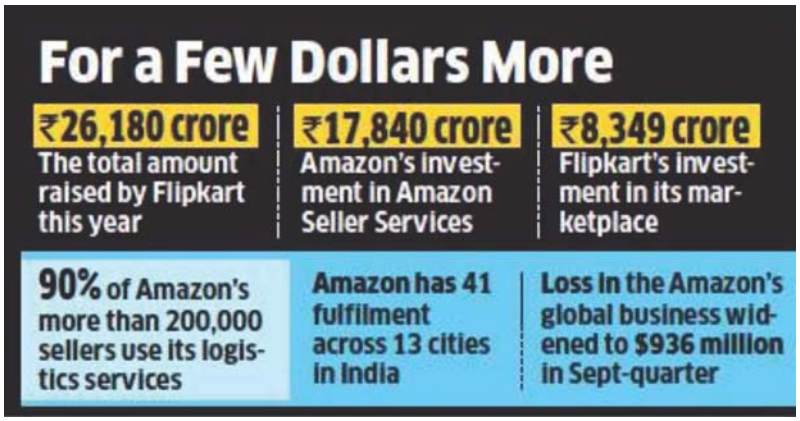


Figure1: Key statistics
Source: Economic Times

If one were to go by statistics India has the second largest number of internet users which is about 345 million and is expected to cross 550 million by the end of 2017. The future of e-commerce industry is glorious because according to Internet and Mobile association of India, Indian e-commerce industry is adding 6 million new customers every month. In its recent report IMAI also stated that the industry is about to reach revenue of Rs. 211,005 crore by 2017 and that by the end of 2020, Indian e-commerce industry will generate $100 billion online retail revenue. Almost 35% of it will be from fashion and the apparel industry which will grow four folds in the coming years. As of now Indian e-commerce is the fastest growing in the Asia-Pacific region at a CAGR of over 57%.

This shift in consumer shopping experience is partly because competition in Indian telecom industry has made high speed mobile internet available at affordable prices to the masses.The inception of technology has given birth to new services such as Digi-payments, Hyper-local Logistics. It has also led to the growth of MSMEs by providing essential facilities such as finance, technology, training and development. The e-commerce sector is also witnessing a string of merger and acquisitions. Some of the major deals took place in segments such as food technology, hyper-local and real estate listing. There were 930 mergers and acquisitions to be precise amounting to a total of 26.3 billion dollars. Snapdeal.com entered into the most numbers of mergers and acquisitions in the last 2 and 3 years as a strategy to rebrand and reposition themselves in the Indian e-commerce space.

With this pace of development in the e business space it becomes imperative to study how will the roles and responsibilities of the vendors change and importantly how is their collaboration with the e-retailer structured? Are the vendors able to secure their position in this new distribution channel? Thus this study will unveil the important elements of the channel relationship and the possible areas of improvement in the e-retailer and vendors relationship.

Literature Review

E-commerce has fundamentally restructured business relationships and has caused a paradigm shift in channel power as information technology continues to invade businesses.

Gates(in Adelaar, 2000) opined that electronic trade will bring about a structural change in the market such as disintermediation however Sarkar *et al* (1995) disagreed stating that differnet outcomes are possible such as reintermediation or cyber-mediation.

Palacios Juan J., (2003) discussed that in a developing country there are many factors that inhibit and push the growth of E-commerce and all of them must be observed with diligence as some of them manifest in the long run. The very basic of them is the creation of the legal framework that regulates the e-commerce industry, followed by improvement in the country's telecom infrastructure and the emergence of e-banking and e-governance that makes it more efficient. Once all of this is done large multinationals get attracted and the e-commerce industry unfurls. This gives rise to an economy that's largely based on the internet and helps in the development of various new technologies. These trends were seen in Mexico and similar trends were seen in India as well, back in 2000s. In Mexico banking and finance industry were the most advanced sector to adopt the e-commerce to discharge their businesses, and the least advance was the manufacturing sector. But the picture in Indian context is quite different. The sector that adopted e-commerce in India very aggressively is the retail sector and is still growing in a rapid pace. However, now almost all the sectors of Indian economy are embracing e-commerce. Five propositions were stated in this literature;

i) Global forces are more powerful for the diffusion of e-commerce when compared to domestic forces, this was stated true in Mexican economy, however no such evidence of it is found in Indian economy, as the major e-commerce players are all Indian firms, global firms entered late.Infact eBay was the first to enter the Indian market way back in 2000s but it could not meet success. ii)Micro and Small enterprises are least likely to use e-commerce-this didn't prove to be true, as they are the ones who are most flexible to adopt new business strategies to counter the stiff competition they face from the multinationals, the same holds to be true for India as well. Majority of small and micro small enterprises find it very easy to sell their product online via online platforms as it is relatively cheap and has a nationwide access when compared to a brick and mortar store. iii) B2C e-commerce spreads rapidly than B2B e-commerce this is true in Indian context but wasn't proved in Mexico as a major chunk of Mexican population is poor and is scattered all around and the diffusion of internet wasn't that rapid, however firms used e-commerce in a relatively great extent, so in Mexico B2B e-commerce was topping the charts in the initial stages .iv) Government policies are essential for e-commerce growth this is true in both the countries as government pushes the level of technology, provides the required infrastructure for mobile telephony and other communication services, it also aids various telecommunication service providers v)Lastly, a legal framework should exist so that progress and shortcomings are continuously monitored this also reduces the incidents of malpractices and saves all the stakeholders of the industry from any type of harm.

Gawady, (2005) found out that the factors that push the development of e-commerce in a country whether developed or developing, is taxation, security of assets, privacy, profitability, content and participation in new international standards development. In recent years, U.S. marketplace has been the hotspot of e-commerce growth despite the period of recession and firms are entering and expanding their stand in e-commerce industry on a continuous basis.This has resulted in a rapid increase in the incidents of buying by consumers online. E-commerce currently represents a significant share of the overall economy. The primary route by which e-commerce will have a major impact on the economy is by way of its reliance on productivity

and inflation. Business and consumers use e-commerce because it is beneficial as it reduces costs to a major extent in terms of hours spent and work done to make the products and services reach the end consumer and finally complete the transactions. The result of this exercise increases the productivity and lowers the cost. As the e-commerce firms work diligently towards its goals all the other firms that are not a part of e-commerce industry will work to escape competition and the productivity of the whole economy will increase. Prolonged expansion of electronic commerce may also result to reduced pressure on inflation through greater competition, saving cost, and changes in price-determining behaviour of sellers. It was examined that these factors have contributed to the rapid growth of e-commerce and help in assessing how the trends are going to shape up in the future and how this may affect the overall economy.

But the scenarios are a bit different when it comes to a developing country as the challenges they face are numerous and hinders the smooth expansion of e-commerce and these challenges continue to stay in spite significant growth in internet usage and increase in the number of internet users and other value add services.

Javalgi, Ramsey, (2001) in their study stated that e-commerce and internet has linked nations, organizations and people operating locally, regionally and nationally. At this colossal rate of technological advancements, global e-commerce embraces almost every country of the globe. E-commerce is all about tremendous speed, seamless connectivity and sharing or exchanging goods, services and information. E-commerce can prove very beneficial as it can improve the allocation of resources, enhance the relationships between various stakeholders, increases competitiveness, cuts costs and increases the overall efficiency of the economy. For e-commerce to flourish in a country there are four sets of variables that should be there these are 1) Computer and telecommunication infrastructure. 2) Commercial infrastructure. 3) Social/Cultural infrastructure. 4) Government/ legal infrastructure. Further there are certain marketing/distribution implications which play a crucial role and both e-commerce and virtual distribution channels empower the consumers. It makes them proactive, assertive, more predictable and less brand loyal. Channel structure and channel length (number of intermediaries involved in the transfer of goods, services and information) is a function of market structure. Authors suggest that intermediaries add significant costs to the transactions and such costs are borne by the consumers but e-commerce setting minimizes and eliminate the unnecessary number of intermediaries, and this direct connection will lower the cost of transactions and the final prices of the product get reduced. This phenomenon is known as “disintermediation” wherein benefits are transferred to the consumers by involving internet.

Luk Sherriff T.K., (1998) discussed that channel structure forms the basis for market entry in the target overseas market. The most common problem that all the MNCs face while they try to tap the Chinese market is the selection of a proper type of distribution channel that is to be used. The most widely present factor is the diversities that exist between markets in terms of size and geography a firm must use permutation and combination to a very large extent to come up with the most efficient distributive network

According to Rosenbloom and Larsen,1993 view once a distribution network is devised that is effective it will be able to solve the issues that emerge out of a nation’s environmental idiosyncrasies

Coelho, Easingwood, (2008) in their study discussed thatMarketing channels seldom change or if put in other words they react very slowly to the changes. Various factors come in play explaining this particular behaviour of the distribution channels. The place mix is an integral aspect of a firm’s positioning strategy and gives it a competitive edge. For a firm to retain its competitive edge it should examine the mix of channels continuously so that changing customer

needs can be accommodated. Distribution can be regarded as the most lethal weapon of a firm's arsenal. Numerous external factors have resulted in making it more significant, these factors are continuous pressures on competitive advantage, distributor's ever increasing power, low distribution costs is, stress on growth, and new technical advancements. It has been asserted that "channel design should be used as an integral part of a ûrm's attempts to gain a differential advantage in the market" and in order to attain this, numerous firms have made radical changes to their marketing channels and reorganized them by way of investments in new electronic channels. The magnitude of channel transformation is based on: consumer's needs that are increasingly volatile; level of sophistication of the targeted customer; minimalist nature of the product; rapid changes in the external environment; force of competitors' strategies that might make the firm vulnerable; economies of scale; and company size

Tuominen M, (2004) in their study on "Efficient Consumer Response" discuss that the same has replaced prior management fads and rules of the competitive landscape in the ûeld of grocery trade. This initiative is based on creating value for the end customers through a supply chain value system that is efficient, and simultaneously provides appropriate value to the channel members involved. The results indicate that by way of a strong positive association between channel members and the ûrm the overall value increases and further that the relationship develops an ability to counter various contingencies. In managerial terms, business executives must carefully design a match between the strategic channel posture the ûrm possesses and its value creating and appropriating capability proûle in managing collaborative channel relationships.A fundamental premise of channel collaboration is managing relationships based on long-term relational exchange as opposed to more traditional transaction-based exchange

Harvey and Speier (2000) suggest that channel partnering and supply chain collaboration has been explained in part, as a result from trust between parties and relationship commitment. Channel strategy is concerned with creating sustained competitive advantage leading to superior ûnancial performance. According to Mizik and Jacobson (2003), two processes, which combine and interact, are fundamental behind this rationale: one involves the creation of (customer) value (i.e. innovating, producing and delivering products to the market), while the other focuses on appropriating value in the marketplace. Kiran, Majumdar, Kishore, (2012) advocated that relationships in distribution channels tend to be long-term oriented and members of the channel rely on each other to jointly realize their goals by serving buyers. Despite the channel's focus on serving buyers, conflicts often arise between channel members because of each member's self-interest. When conflicts arise, the perceptions of a channel member based on normative, rational/instrumental, or emotional reasoning will influence relational norms like trust and commitment that characterize the relationship between members. Understanding how relationships are damaged is a critical component in building and preserving strong distribution channels. A theoretical framework to study conflict resolution in distribution channels and its impact on channel relationships is developed by identifying the variables to represent channel member perceptions, relational norms, conflict resolution strategies, and relationship quality. Propositions linking these variables are developed and indicate how these variables influence one another when conflict occurs.

Jain, Khalil, (2012) discussed that glocalisation cannot be achieved by a single or any unique formula because the element of localization makes it different every time. A firm can go inter-decision or intra-decision glocalisation or it can choose to combine both. However, the choice should be made on the grounds of comprehensive assessment of the ûrm's global philosophy, the channel decision involved, and ground realities in each market as they differ a lot. The study presents evidence on how global localisation is applicable to channel strategies prevailing on a global scale. The study ûlls the gaps that were found in previous researches by bringing

into light "global dimension" of a glocal strategy that were less understood. The study is the most effective till date and provides information about the unexplored facts of global-localisation. The study also acts as a value add to the limited knowledge on the practical application of the concept of global-localisation among both academics and practitioners.

Mulky, Avinash (2013). One inimitable source of strategic competitive advantage for a company is an exclusive distribution channel. However, to get a pitch perfect distribution design is something only a few Indian firms have gotten a hang of. The same is achieved after years of experience and trying out various combinations to check as which combinations will suit the best. This research is divided into two parts. First part of this presents an overview of distribution channels, particularly their constituents and structure, with a special focus on distribution channels in India. The second part gives and account of the challenges that companies in India face in designing, constructing, and managing distribution channels on the ground with the help of a panel discussion with eminent academic and industry experts.

Shah, (2016) in his study analysed that in the last 40 years or so there has been a humongous change in the patterns of distribution worldwide. In 70s the retailers used to obtain their supplies directly from suppliers or wholesalers then came the 80s this was the era of stores which were involved in centralised deliveries. Global sourcing and import were on the rise in the early 90s and then came the glorious era of e-commerce and e-fulfilment. E-retailers have to make an intelligent decision and weigh all their options of employing a courier company, or hiring a specialist third-party logistics provider and lastly they can develop an in-house logistic department. At the end of the day, whichever means they use to get to their end, there are certain key points that are of immense importance to company and should be executed these are 1) Delivery that is pitch perfect and involves low cost. 2) Cost-effective service. 3) A cutting edge enterprise resource planning software or ERP that organizes product planning, manufacturing, inventory management, cost and development, marketing and sales, shipping and payment. For an e-retailer who trades goods across-border, all these process are planned by specialist logistics handlers who are experts in their respective fields as international rules and regulations come into picture. All the functions of procuring the supplies, storing them, generating invoice and delivering the goods to the end user all these are determined by four factors - speed (so the delivery is 'on time, every time'), accuracy of orders (so people get what they ordered for), analytics (so growth is monitored continuously and competitive edge is maintained) and surge (the traffic Vs fulfilment graph). The amount of transparency in the entire supply chain is an inimitable resource through which the e-retailer wins the faith and favour of the customer. This study indicated that shoppers give more weightage to delivery time and facilities like free shipping etc over anything else, when it comes to shopping online.

The intensity of relationships between manufacturers and retailers in a distribution channel depends on the bargaining power of both parties. The authors have developed a comprehensive framework to evaluate bargaining between channel members and make it evident that the process of bargaining affects the magnitude of coordination between one manufacturer–one retailer channels. The results were put to test in the field and theory and for the same both the author had to lower the degree of the empirical assumption that the product being exchanged is bound to be exchanged in a contractual realm. The results indicate that the institution of bargaining is formidable, and has numerous effects on channel coordination when the complexity of non-specifiability of the product exchange is present. The scholars also uncovered a fact that if a retailer exercises more power in a channel this automatically promotes channel coordination. This in turn gives rise to multiple situations where in the presence of a powerful retailer might actually be beneficial to all channel members' interest. Another major finding that emerged out in the course of this research that the standard double-marginalization take-it-or-leave-it offer is

the end result of a specific type of bargaining process. Furthermore the impact of early delivery and late delivery that is the product being delivered to the retailer before or after the actual demand arises and the effects of returns and competition existing among the retailers have been evaluated**.**

Szopa P., Pekala W, (2012) A distribution channel performs various functions these are physical movement of completed products and services, actual transfer of ownership, transfer of information, risk bearing, negotiation and realization of orders. The most important part is that these functions flow in both the directions that it manufacturer to the customer and from customer to the manager, for instance the product, its ownership and risk flows to the customer and payments, information of market flows towards the manufacturer, further this paper explains about the types of Distribution Channels that exist there are two types of distribution channel Vertical Channel and the Horizontal Channel the former consists a channel structure where in a large number of intermediaries are associated closely with the manufacturer, the latter on the other hand consists various number and types of intermediaries at different level for different kind of distribution task based on their previous work record and their efficiency.

Snapdeal and its current crisis, (Economic Times, 2017) Desperate measures undertaken by the e-commerce giant of India in the last 12 months did not prove very fruitful. Industry experts have been continuously arguing that there never existed any business model at Snapdeal. As a strategic and calculated move in order to be the most profitable e-retailer of India, it had decided to revamp its business model. However, there wassnot much scope in that realm as out of the two models that have been working effectively in India i.e. marketplace and inventory based model, Snapdeal had tried both the models. However, it was just a perfect illustration of desperate times, desperate measures. Foxconn Softbank and Alibaba group firm's chief executives stated that they had pledged not to take salary for an unspecified period. This was attributed to large number of losses that got piled up for a long period. Not only this, Snapdeal's top management was not very stable. With a very high turnover rate, and increasing competitive pressure from Amazon, the e-commerce giant had streamlined their goals which involved reorganizing the company into a lean focused structure. They were combining teams, eliminating noncore projects and had a razor sharp focus on profitable growth by reducing layers. The firm planned to achieve this by laying off 1000 of its employees from all the stages in the hierarchy. This strategic lay off regime was not limited to the firm only but, its logistics partner," Vulcan Express" was also a part of this move.

After analyzing the secondary data exhaustively, the objectives for this research were laid out as follows:-

i. To study the distribution design/framework of the various E-commerce companies of the Indian E-commerce industry.
ii. To evaluate the nature of relationship between E-commerce companies and their vendors.
iii. To suggest areas of improvement for better relationship management of e-commerce firms and their vendors.

Research Methodology

This research used Descriptive research design and consists of both quantitative and qualitative research. The base of this research comes from an exhaustive study of various research papers on this particular topic by various scholars. The primary data has been collected with the help of questionnaire after an exhaustive and judicious secondary data study,as well as personal observation with contact of vendors. The questionnaire was pilot tested. A total of 30 vendors were chosen who are currently registered with the online portals (Flipkart, Snapdeal, Amazon etc). The questionnaire was rated using a five point Likert Scale.

Results and discussion

The internal consistency of the measures was ascertained via reliability tests. The reliability of the questionnaire is checked by way of Cronbach's Alpha coefficients. There are certain assumptions based on which the researcher can assess if the questionnaire will generate reliable responses or not, these assumptions are as follows:

- 10% of the total sample size should be exposed to the questionnaire in order to conduct an effective test of reliability. In case of this research the sample size is 30 vendors i.e. 3 vendor's responses should be considered for the same.

The value of alpha should be between 0.65 to 0.8. This would mean that the data generated by the questionnaire is reliable, but if the alpha value comes out to be 0.5 this means that the data is unreliable and a few changes should be made to the questionnaire. If the value of alpha is very high i.e. >0.95 it indicates that the data is redundant. The gathered data has been tested for correlation between various factors and then all the factors that were more significant were tested for regression, and the results are as follows.

Table 1: Reliability Tests

Case Processing Summary

		N	%
Cases	Valid	3	100.0
	Excluded[a]	0	.0
	Total	3	100.0

a. Listwise deletion based on all variables in the procedure.

Table 2: Reliability Statistics

Cronbach's Alpha	N of Items
.688	4

The results in Table I depicts that for the test of reliability the alpha value comes out to be 0.688 which indicates that the construct measures are reliable.

Channel relationship in terms of Finance & Profit, Conflict & Price setting

After analysis of the data, three main factors emerged as the major elements of channel relationship.Table II a depicts the correlation between the dependent factor i.e. Relationship (meanrel) and the independent factors which are 1) Finance and Profit(meanfp), 2) Conflict (meancon) and 3) Price setting(meanpr).

Relationship of E-retailers with vendors and Finance and Profit factor have a moderately positive correlation which is 0.297. Since this is a positive correlation it means that as Finance and Profit in this collaboration increases the relationship is bound to get better .This fact is also

supported by the level of significance which is marginally higher than the accepted significance level of 0.1. The same is due to the limitation of sample size which happens to be small. As the sample sizeshall increase the results will improve too.

The Relationship of E-retailer with vendors and their Conflict have a low positive correlation i.e. 0.065. Since this a positive correlation it means that as conflict increases the relationship is bound to get better. This may be regarded as a "Functional Conflict" with useful consequences however as the level of significance (0.735) is greater than theaccepted level of significance, we don't have much evidence that will prove what has been stated above .

Relationship of Online portals and Price Setting have a high positive correlation i.e.0.512. This clearly indicates that as the efficiency in Price Setting increases, the relationship between the vendor and the E-retailer will strengthen. This is also supported by the level of significance (0.004) which is very low and thus validates the above fact After applying correlation, it was clear that only two factors qualified for regression: Finance and Profit(meanfp) and Price Setting(meanpr). Thus the impact of these two parameters on the channel collaboration and relationship of e-retailers with the vendors was much more significant as proved by correlation results. Analysis of regression (Refer Table III) further reveals that the value of R square is 0.264 or 26.4%. This implies that 26.4 % change in the dependent variable i.e. Relationship is the end result of changes in the independent variable which are Finance and Profit and Price Setting.

Table 3: Correlation between channel relationship, finance & profit, conflict and price setting

		meanrel	meanfp	meancon	Meanpr
Meanrel	Pearson Correlation	1	.297	.065	.512**
	Sig. (2-tailed)		.111	.735	.004
	N	30	30	30	30
Meanfp	Pearson Correlation	.297	1	.285	.506**
	Sig. (2-tailed)	.111		.126	.004
	N	30	30	30	30
meancon	Pearson Correlation	.065	.285	1	-.016
	Sig. (2-tailed)	.735	.126		.933
	N	30	30	30	30
Meanpr	Pearson Correlation	.512**	.506**	-.016	1
	Sig. (2-tailed)	.004	.004	.933	
	N	30	30	30	30

**. Correlation is significant at the 0.01 level (2-tailed).

The second thing that is evident from regression analysis is that the significant value (p) is 0.016 which is less than the value of alpha (a) 0.1 i.e. p<a .Thus the results are insignificant and the null hypothesis that Finance and Profit and Price Setting has no impact on the relationship between the Vendors and the E-retailers stands rejected.

Table 4: Regression analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.514[a]	.264	.210	.54873	.264	4.853	2	27	.016

Managerial Implications: E-commerceis witnessing an unprecedented growth in India and the recent implementation of GST in India has opened up all the more new markets for these online retailers. In this regard, this study will be useful to the e- commerce industry on how can channel relationship be further enhanced and what strategies can be used to develop win-win situations for all the stakeholders: online retailers, vendors as well as customers. This paper addresses the research gap as not much work has been done particularly in India in the area of relationship management in e- commerce. Ofcourse, the balance of power as of now appears to be tilted towards the e-retailer as they gain acceptability in the urban and suburban areas, but the e-retailer should also be conscious that both of them need each other and should be mindful of the policies so that the partnership continues to add value to all the stakeholders in the supply chain. The ultimate objective of the e-retailer and the vendors should be to what extent they can integrate their operational activities in order to achieve a higher efficiency level which shall eventually benefit all the parties in the supply chain. Vendors need to understand that they will have to deliver solutions and not just products in order to survive in this electronic channel. On the other hand, e-retailers should invest in capabilities to provide vendors market intelligence which otherwise is difficult for the vendors to acquire. The good part is that the e-retailers are already working in this direction by investing in data analytics and artificial intelligence. This is one of the methods of value creation in this new business model which mangers in e-retailers can incorporate in their strategies.

Conclusion

This study is all about evaluation of relationship between the e-retailers and the vendors. E-retailers are majorly following the Marketplace model of online retail and are associated with numerous vendors selling variety of goods for instance electronic goods, fashion and apparels, household products etc. All of these vendors provide a certain amount of stock to the E-retailer but since the business model is marketplace the E-retailer doesn't store any of these products with itself rather that stock is with the vendor only. However, that stock will be sold online via the E-retailer because they have agreed on doing so. Once a customer selects a particular product that is being sold by the vendor the E-retailer records that request and that request is initiated to the vendor, the vendor then sends the exact same product to the E-retailer once the product reaches the E-retailer it is then handed over to the logistics department of the E-retailer, most of the retailers have their own logistics firms while others have outsourced it to a professional logistics firm. The logistic department then packs the product and make it transit ready and then the product moves out and reaches the customer. The customer may choose to pay once he/she receives the product i.e. cash on delivery or the payment can be made online.

Once the payment has been received, the E-retailer keeps its part of commission and gives the rest to the vendor. The commission is obviously as per the agreed terms of the contract that's between the retailer and the vendor.

As far as relationship between the buyers and vendors are concerned we have arrived to the conclusion that Finance and Profit sharing and Price setting are the two determining factors that may strengthen or break a relationship between the vendors and the E-retailers, However conflict too has its effects on the relationship but those effects are not so significant. Most of the vendors are satisfied with their relationship with their E-retailers and feel that they are given the exact amount of space and are always heard but they don't disapprove of the fact that the E-retailer is in a more commanding position because of their network with numerous vendors thus losing one or two may not do much harm to a big E-retailer. Commission charged by the E-retailer is perceived high and the services provided against it are once again considered insufficient. Another area of discontent is when a customer returns a particular product. The E-retailer charges commission on return of sale resulting in a loss to the vendor. At times the product which are returned are often counterfeit for which the vendor has already paid the commission. Due to the absence of checks on the product by the end of the E-retailer such lapses ends up escalating the cost for the vendor. So technically the vendors are more vulnerable but they dust this off by saying that they get demand from the entire country instead of just regional sales. Vendors don't have much say in the profit sharing decision; price setting is based on mutual consent most of the time. These prices are a set keeping in mind all the legal and taxation norms because any violation will lead to heavy penalties on both the retailer and the vendor. Vendors also feel that they will sell on a lower margin if their customer base is increasing. Most of the vendors feel contented in their relationship, conflicts are not common and vendors generally have to let go of their goals to accommodate E-retailer's goal. Vendor and E-retailer relationship is a two way street and sooner or later E-retailers should accept that they should treat this collaboration as a symbiotic one in this dynamic world of technology.

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Proceedings of GLOGIFT 17
December 11-13, 2017
Delhi School of Management, Delhi Technological University, Delhi
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Electric Mobility Adoption in India: Emergence, Challenges and Implementation Roadmap

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Abstract

The purpose of this research is to develop an integrated framework for promoting e-mobility in India. Although the concept of e-mobility is in the nascent stage, its importance in reducing emission of greenhouse gases and making environment sustainable couldn't be over emphasized. Literature review on key drivers and challenges related to e-mobility in India reveals that former outweighs the latter comprehensively. The article delves deep into various aspects of e-mobility using various secondary data sourcesin order to propose an integrated framework emphasizing upon the development of holistic e-mobility ecosystem in the country. It traces the policy initiatives taken by the government of India and suggests the various efforts further need to be put in this regard. Study finds that close coordination between different government departments along with the striking a fine balance with the industry holds the key for e-mobility success in India.

Keywords: *Automobile, Electric vehicles, e-mobility, Environment, Government, Innovation, Strategy, Sustainability*

Introduction

Leaving behind the initial disappointment, electric mobility (E-mobility) has gained unprecedented momentum in the last 5 years (acatech 2010). In this research paper, we trace the development and trajectory of electric mobility and analyse the various factors which have helped the electric mobility to cross its threshold and emerge as a preferred option for sustainable transportation. The principal thesis in this research is the fact that there are many factors both from within the automobile industry and in the larger socio-economic domain that is coming together to provide a new impetus to the electric mobility. Even the government policies and support is playing an important role in widening the scope of electric vehicles across the countries (Hoogma et al., 2002; Geels and Schot, 2007). In order to analyze the supporting factors, this research adopts socio-economic perspective as this approach does not priorities one factor over another (Rip and Kemp, 1998; Geels, 2002,). Another advantage of using this approach is the fact that it considers interrelation between social and economic actors and respects their inexorable relationship (Geels 2005). In fact, this is a kind of approach that is needed to study the emerging area of electric mobility where it is difficult to account one technological or market factor responsible for the change but rather a number of interrelated factors existing mutually are responsible for incremental evolution.

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The research also takes into account the actor-based approach and the various stakeholders involved in the process like customers, dealers, automobile manufacturers, governments, the public at large has also been considered and given full vintage so as to reach conclusive evidence about the evolution of electric mobility. Another advantage of adopting socio-economic perspective is its ability to explain incremental evolution on the one side and accounting radical and innovative changes on the other.

Literature Review

The spurt in the financially sound middle-class across the globe has led to the rise in demand for the cars. These people are willing to spend for individual mobility and owning a car also constitutes a part of their social status. Globally the car ownership rises from 59 million to78 million with China alone registering unprecedented growth from 2 million to 18 million between 2001 and 2010 (OICA, 2010).

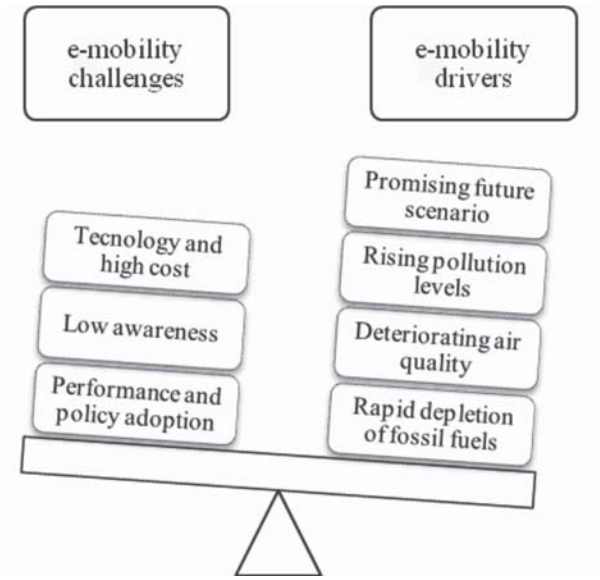


Figure 1: Drivers and challenge for e-mobility

In India too, the flourishing middle-class has catapulted the status of auto industry from nascent to major sector which now contributes 7.1% to overall GDP. Further Indian auto sector accounts for 26% of industry and 49% of manufacturing GDP (SIAM, 2016).In order to substantially reduce the pollution levels, large part of vehicles featuring internal combustion engine (ICE) has to be substituted and it's exactly where electric vehicles comes into picture allowing conventional mobility with ultra-low emissions. As observed by Perez (2004), transition from ICE based mobility to e-mobility requires techno-economic shift which will ultimately replace the older ideas in the interest of more productive and modern practices. In Indian context too, this paradigm shift is absolutely essential and has to be achieved under strict timeline. Leading such a shift and that too under the enormous uncertainty warrants a comprehensive policy framework from government. It's very much evident that well-coordinated efforts are required to establish an integrated e-mobility ecosystem in India. Given the fact that major investments and technological innovations are driven considerably by nature of assumptions policymakers has about present and future, success of e-mobility policy depends significantly on establishment.

Challenges for E-mobility in India

Considering the overarching theme of e-mobility, the complexity of the situation in Indian context is even more evident (refer fig 2). The shining example of the city of Amsterdam which has established electric charging network of over 400 stations can be a guiding example for the indian policy Framework. The principle obstruction in the wide adoption of e-mobility not only in India but across the globe is the poor battery performance of the electric vehicles. Despite years of innovation and Research and Development, the output is not something that is very much desirable and still requires considerable improvement before the electric mobility becomes a mainstay in the transportation sector. Small and lightweight batteries quickly run out of the charge and in order to overcome the range anxiety, use of the heavy battery is required which in turn increases the gross weight of the car and blunts the performance. Researchers are still to arrive at the optimum combination of battery weight and range which will bring together best of both worlds.

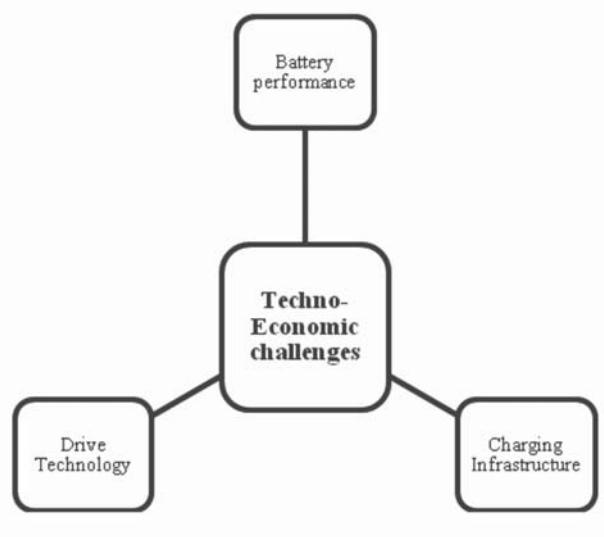


Figure 2: Techno-economic challenges for E-mobility

The second main challenge manifests in the form of lacking charging infrastructure and although charging can be done at home or workplace, there is absolute need of strong public charging infrastructure system across the country. The shining example of city of Amsterdam which has established electric charging network of over 400 stations can be a guiding example for the Indian policy Framework. (Van den Hoed et al., 2013). In India however the charging stations are almost non-existent at public place and owners of e-vehicles have option of only private, in-house charging.Public charging can be offered at public places like fuel stations, airports, public parkingalthough the provision requires considerable investment and has many implications for already inhabited areas (Bundesregierung 2009; Buttner 2012). Besides, the public charging stations, more sophisticated technique involves the creation of magnetic field for wireless energy transfer. The technique known as electromagnetic induction creates magnetic field through the use of induction loops (e-on 2016). Although very efficient in charging, the method is out of feasible options in Indian context owing to high cost and complex technology involved (EPRI 2011). The concept of e-mobility calls for entirely new interface between e-vehicles and mobility planning which goes beyond the incremental improvements. The evolution of such interfaces

require radical alterations in both policy and business domains. Further, this will also affect the attitude of masses towards concept of mobility. Drive technology is the third main challenge which is although not as complex as the battery issue but still requires considerable innovations to layout a new Framework for driving the electric vehicles. In fact, when compared to the conventional vehicles electric drive requires less moving part and accordingly, the cost required for transferring the drive from the motor to the wheels will be less than the ordinary vehicles. However, the development of electric drive Technology depends squarely upon the evolution of battery Technology which is far more difficult and requires some more time before we reach an optimum combination of battery performance and drive Technology.

Roadmap for E-mobility adoption

Electric vehicles are getting more attention and prominence from both policymakers and consumers owing to variety of reasons including emergence of innovative technology, encouraging government policies, and overall support for pouring in to help owners purchase and maintain electric vehicles. Having said that, scaling up of electric vehicles penetration in India requires dealing with four major barriers - infrastructures, market and competitiveness, technology, and policy related issues (refer fig 3).

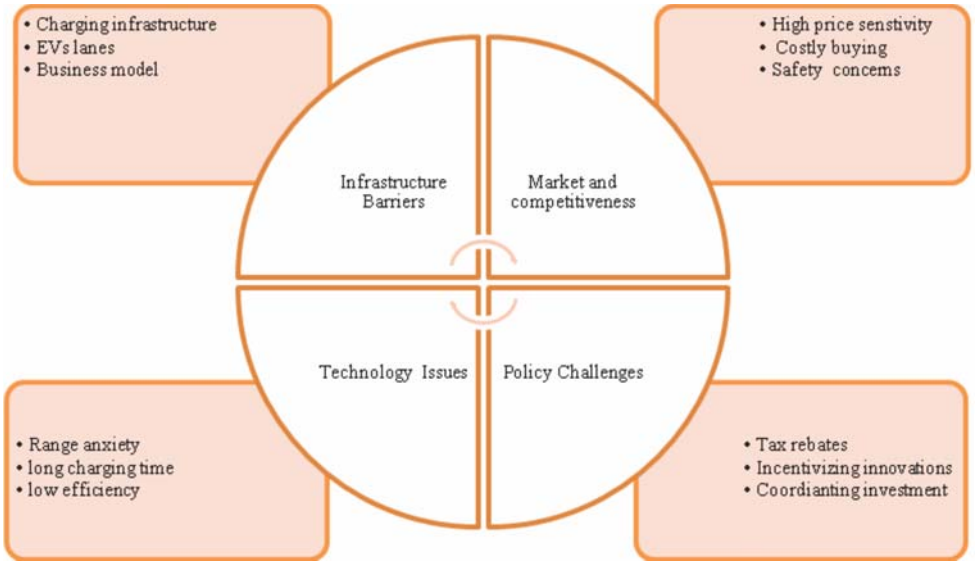


Figure 3: Four key areas for roadmap implementation

Issues related to infrastructure barriers largely include absence of charging infrastructure, lack of dedicated electric vehicles lanes, and non-existent electric vehicles business model. There needs to be a big push on the front of developing charging infrastructure which will act as solid bedrock for enhancing appeal of electric vehicles. Dedicated separate lanes for electric vehicles, especially for slow moving two-wheeler and bicycles will be helpful in facilitating electric vehicles movement on the road. Similarly in order to ease charging anxiety, battery charging stations and swapping points must be made available at various commercial and public places. A business model in this regard which facilitate renting of electric vehicles and swapping of fully charged battery for discharge ones will also prove helpful in expanding base of electric vehicles in India.

High price sensitivity of the Indian market present a biggest challenge for the electric vehicle manufacturers as the initial cost of electric vehicles are 30-40% more than their fossil-fuel

powered counterparts. Safety concerns are also big hindrance as Indian customers are still sceptical about overall security of driving and maintaining electric vehicles. Further the perception of poor performance and impracticality need to be tackled before electric vehicles can enjoy same respect as their fuel-powered counterparts in the eyes of prospective buyers.

On the technology front, electric vehicles needs to evolve holistically as the current rate of innovations are not able to keep up the pace with the users' requirements. Limited range of electric vehicles and long time to charge the battery are the major concerns manufacturers have to address before these vehicles can become part of mainstay line-up. Also, there is pressing need to make batteries more efficient and cost-effective while keeping the overall kerb-weight as low as possible. The Challenges of the policy front are multi-pronged. Not only the government need to proactive and institute practices for promoting electrical vehicles in India but also has to work as a catalyst for stimulating various technical and innovative solutions related to e-mobility. Accomplishing all these challenging tasks within the framework of constitution and competing interests is indeed a tasking goal and requires a firm commitment on part of government.

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Moderating Effects of Gender on Online Shopping of Wooden Handicraft Items

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Abstract

Handicraft is one of the many productive sectors for developing countries. It contributes significantly towards economic growth. This study seeks to investigate consumers' perception (gender moderated) towards purchase of wooden handicraft items through e-commerce platform. The proposed model investigates the role of trust, website quality, service and product perception on consumers purchase intention towards wooden handicraft items online. The effect of website quality, service and product perception was analyzed for the Technology Acceptance Model constructs namely: Perceived ease of use and perceived usefulness. 234 respondents were surveyed and data was analyzed using Structural Equation Modelling technique. The results depict that gender is a crucial moderating variable for e-commerce customers. Identification of differences between male and female genders enables better understanding for practitioners towards online shopping behaviour. This allows development of efficient marketing strategies.

Keywords: Technology Acceptance Model; E-commerce; Online Shopping; Trust; Gender; Handicraft.

Introduction

Handicraft is an unorganized and essential segment of Indian economy. By definition, it is useful and decorative domestic items fully crafted by simple tools and hand. Operational instruments and techniques vary somewhat because of regional differences in craftsmanship. Industry employs skills of artisans like wood carving, weaving, leather work etc. This sector is growing annually at 20% growth rate and it also provides huge employment opportunities to local artisans (Yadav and Mahara, 2016). Despite being an essential component of Indian economy, it comes with added constraints of capital deficiency, lack of marketplace, lack of trained staff etc (Bhat and Yadav, 2016).

Wooden handicraft includes manufacturing and carving of wooden items. These include furnitures, gift and kitchen items and antiques. It has been acclaimed due to increase in customer base seeking novelty and appreciation. Manufacturing zones of wooden handicraft items are spread across India in places like, Saharanpur, Jaipur, Mysore, Jodhpur, Ernakulam and Cochin (Yadav and Mahara, 2016). Majority of wooden handicraft items are hedonic in nature. Hedonic utilization is experience of a product through touch, feel, visual image, sound and task (Hirschman &

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Holbrook, 1982). With ever increasing competition this sector has to innovate its sales techniques to keep going and stay competitive. A study by Paige & Littrell (2003) recommended that handicraft organizations must strategize their marketing and sales activities to supplement reach of offerings to plausible buyers. E-commerce holds potential to amend this situation by offering a fitting sales platform. Offline stores provide wooden handicraft buyers with ability to feel and touch a product prior to its purchase and it lacks in online shopping. On the other hand, ecommerce provides better product information and variety; multi-attributes comparison that leads to decline in buyer-search cost (Alba et al., 1997).

For the online sales strategy to succeed, it is essential to understand the purchase behaviour of Indian consumers towards handicraft items. Numerous researchers have studied concepts like retail practices in e-commerce (Batchelor & Webb, 2010), crafts knowledge progress (Nedelcheva et al. 2011; Klein, 2000), how to market handicraft products (Nagori & Saxena, 2012), how handicraft products in rural areas empower women (Ericsson, 2001; Wilkinson-Weber, 2004), tourists tendencies towards handicraft products (Müller & Pettersson, 2001), value chain analysis of wooden handicraft manufacturing from Saharanpur, India (Yadav & Mahara, 2016) and many more. However there is little literature on customers' purchase behavior towards wooden handicraft items, especially on Indian customers. Hence, this paper investigates the underlying factors affecting the intention to purchase wooden handicraft items online.

Recent time has seen significant increase in the number of Internet users in India with an increase of 30.5% since 2015 (internetlivestats) and specially people purchasing online in India. The number of online shoppers have increased from 20 million in 2013 to 40 million in 2016 and this number is expected to rise close to 240 million by 2019 (Indian Express. (2016). This number is showing a steady growth because of the extensive mobile e-commerce penetration (Indian Express. (2016). Although number of internet users is high overall, more males engage in online activities as compared to females (Bakshi, S., 2012). The distribution of female Indian shoppers is 35% as compared to 75% for male shoppers (Indian Express. (2016). Thus, gender difference in online shopping attracts researchers to understand consumer's behaviour towards online shopping (Gupta et. al, 1995; Sanchez-Franco, 2006; Rodgers & Harris, 2003; Van Slyke, Comunale, & Belanger, 2002; Haque et. al, 2007).

Role of gender has been examined nested with numerous viewpoints like website design and its usefulness (Cyr & Bonanni, 2005), risk in online shopping (Garbarino & Strahilevitze, 2004), acceptance of technology (Sanchez-Franco, 2006), online shopping behavior (Sharma S., Gupta B. & Sharma V., 2014), favourable likeness of a destination (Sharma, S., Shah, M. & Shukla, R.K., 2014) and organizational commitment of employee (Gupta B. & Sharma S., 2014). Thus, to better target customers and build better models for assessment of consumers' attitude, gender differences can help bring out more insights that will provide more focus and research it deserves (on topic and factors associated). Hence, this study aids by supplementing insights into gender moderated consumers' purchase behaviour towards wooden handicraft items.

Proposed Model

TAM (Davis, 1989) is one of the widely used models for assessment and explanation of technology behavior usage. In this section, an adoption of original TAM model is proposed to evaluate consumer's intention to purchase wooden handicraft items online with gender as a moderator. Along with the original constructs of TAM (Perceived Ease of Use, Perceived Usefulness), four constructs namely Product Perception (PP), Service Perception (SP), Website Quality (WQ) and Trust are proposed and evaluated for e-commerce adoption of wooden handicraft items.

Role of Gender

Many studies have been conducted on gender and its role in computing and technology like perception of website features (Cyr & Bonanni, 2005), risks of online shopping (Garbarino & Strahilevitze, 2004), acceptance of an email system (Gefen & Straub, 1997), Computer self-efficacy and system usage (Hartzel, 2003), acceptance of communication technologies (Ilie, Van Slyke, Green, & Lou, 2005), Computer ability, attitude, and use (Kay, 2006), E-learning acceptance (Ong and Lai, 2006), perceptions of website usage (Sanchez-Franco, 2006), Satisfaction with website design(Simon, 2001), Patterns of Internet usage (Teo & Lim, 2000), Perception of online shopping (Van Slyke et al., 2002), Technology use (Venkatesh & Morris, 2000) and Students' computer attitude (Young, 2000). Despite usage of many internet and commercial applications, males and females harbor different perception and attitude towards usage of online platform for shopping. Study by Dittmar et al. (2004) shows that male attitude remains fixed whereas female attitude can shift drastically and can become unfavorable towards shopping online.

Another viewpoint to the discussion is differences in style of processing. First one is item-specific processing by genders where attributes exclusive or distinct are more stressed. Secondly, relational processing where emphasis is laid on similarities in theme among different piece of information (Hunt and Einstein, 1981). Both genders socialize differently where male are taught or learn to prioritize strong sense of socialization (agentic sentiments) whereas women learn to value sense of unity (communal sentiment) (Eagly, 1987). Males are more concerned about self focused (agentic sentiments) goals, whereas females are driven more by sense of unity (communal sentiment). Therefore, processing by females is relational and by males is item specific (Putrevu, 2001, 2004). Studies conducted on gender specific role in offline shopping shows that females spend more time in shopping than males as they appear to enjoy it more than males and indulge in bargaining hunt and comparison amongst products (Wood, 1998). Study by Cho (2004) shows that difference in online shopping attitude exists as females enjoy and prefer physical assessment of products like view and touch a product prior to purchase. Although with better image enhancement tools sellers provides clear image and animation of items on website, still there is lack of feel or touch. In comparison, males tend to keep their information gathering limited to issue or relevant context and they end their search once information gathering for relevant context is finished. Thus, it is important to evaluate the role of gender for consumer's perception.

Therefore, the proposed extended TAM model is evaluated to investigate the factors that facilitate or impede intention of Indian consumers to shop online for wooden handicraft items with gender as a moderator.

Perceived Ease of Use and Perceived Usefulness

In this study, Perceived Usefulness (PU) is characterized as the degree to which a customer believes that e-commerce will enhance the efficiency/productivity to buy wooden handicraft items. PU is measured in regards of time, cost and exertion required to buy wooden handicraft items on the website. Perceived Ease Of Use (PEOU) is characterized as customer's belief that purchasing wooden handicraft items online will be free of effort. PEOU is measured as process easiness to search items, comparisons, transactions and finally purchase of wooden handicraft items. Past studies on e-commerce affirmed the positive impact of PU and PEOU on behavioral intention. PU and PEOU both impact Attitude toward usage (ATU) and this thusly positively impacts Intention to Use (ITU) (Zhang & Prybutok, 2003).

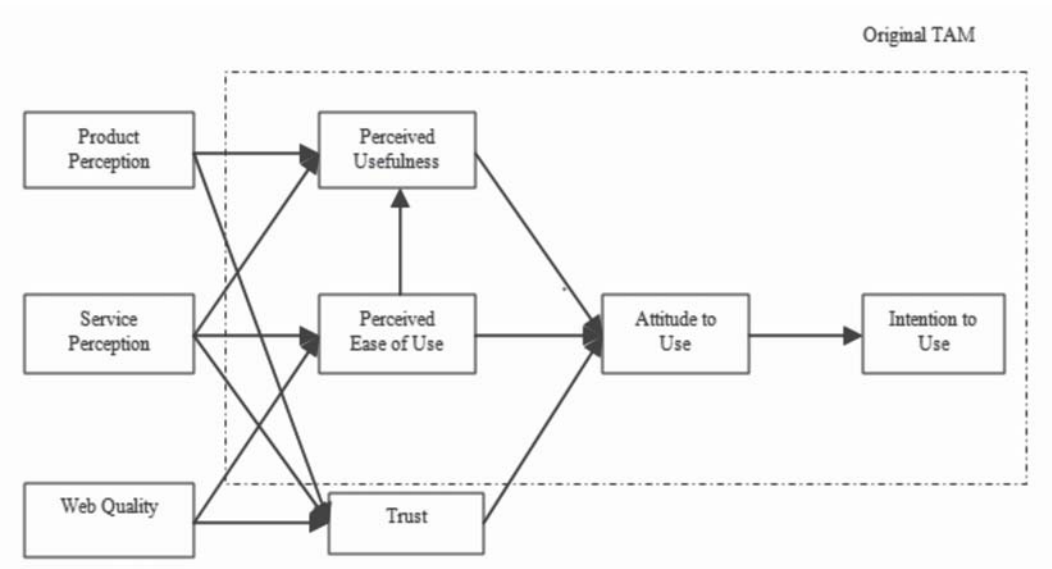


Fig 1: Proposed Model

The constructs of the proposed model are defined and explained further.

Trust

McKnight & Chervany (2001) define trust as the point of reliability and credibility on new technology by people. It remains one of the key effective tools to reduce uncertainty and risks (Suh & Han, 2003; Pavlou, 2003) and generate a sense of safety. As uncertainties exist in online transactions, numerous researchers agreed upon the role of trust in influence over customer to successfully adopt e-commerce (Gefen, 2000). Jarvenpaa et al.(2000) assessed relation between perception of internet retail stores reputation on customers trust on store. Failure to directly see and touch a product customer feels greater uncertainty and risk in their decisions. Trust remains one of the key effective tools to reduce uncertainty and risks (Suh & Han, 2003; Pavlou, 2003) and generate a sense of safety. Previous studies understood the role of trust in development of consumer intention and attitude to use new technologies (Chen & Tan, 2004; Childers et al., 2002; Davis et al., 1992; Gefen et al., 2003; Gefen, 2004; Pavlou, 2003). Hence, it can be said that consumers' trust on online retailers and Internet is understood to play a pivotal part in consumers' online shopping behavior. Therefore, in the present study, we attempt to examine the direct impact of trust on consumers' attitude.

Website Quality

It is defined as the degree of user friendliness in using a website (Kim & Lee, 2002) and is considered one of the important factors for online store (Lee & Lin, 2005). Numerous studies have assessed relationship amongst website quality and users' acceptance. Most consumers agreed that this factor influences perspective of consumer as it is the portal through which transaction can be directed. In this study, website quality is assessed as nature of website's user interface (UI) alongside features given to pursue search, operations and deliver helpful information in regards to wooden handicrafts items on the web.

Product Perception

Product/Item perception additionally termed as product value contains understanding an item towards price, quality and variety (Lee et al., 2009). Item Price is characterized as the cost paid for an item by the purchaser and it ought to be practically identical with costs accessible for a similar item at other option sources (online or offline). Product Variety is the quantity of choices that is accessible to the customer to pick an item. Long tail phenomenon influences the assortment of items accessible offline, yet numerous choices are accessible on the web (Hinz et al., 2011). Perception of quality of item is capacity to satisfy customers' need. Through purchase made online, a customer can't touch and feel the item; consequently perception of quality plays a fundamental part in deciding the item's perception and trust towards vendors.

Service Perception

Benefit Perception otherwise called E-Service Quality is characterized as general customer's assessment and judgments in regards to the nature of items/services (Santos, 2003). In this study, service quality assesses quality of service given by website to the customers. Rendered services incorporate reliability and receptivity of website. Reliability is measured as time of delivery and ease in return and refund while receptivity measures how quick the website reacts

Table 1: Proposed Hypotheses

	Hypotheses
H1	Perceived Usefulness will positively impact consumers' attitude to use e-commerce for purchase of wooden handicraft items.
H2	Perceived Ease of Use will positively impact consumers' attitude to use e-commerce for purchase of wooden handicraft items.
H3	Perceived Ease of Use will positively impact Perceived Usefulness towards adoption of e-commerce for purchase of wooden handicraft items.
H4	Consumers' attitude to use will positively affect intention towards use of e-commerce for purchase of wooden handicraft items.
H5	Trust will positively impact consumers' attitude to use e-commerce for purchase of wooden handicraft items.
H6	Website Quality will positively impact Trust towards adoption of e-commerce for purchase of wooden handicraft items.
H7	Website Quality will positively impact Perceived Ease of Use towards adoption of e commerce for purchase of wooden handicraft items.
H8	Product perception will positively impact Perceived Usefulness towards adoption of e commerce for purchase of wooden handicraft items.
H9	Product perception will positively impact Trust towards adoption of e-commerce for purchase of wooden handicraft items.
H10	Service perception will positively impact Perceived Usefulness towards adoption of e commerce for purchase of wooden handicraft items.
H11	Service perception will positively impact Perceived Ease of Use towards adoption of e commerce for purchase of wooden handicraft items.
H12	Service perception will positively impact Trust towards adoption of e-commerce for purchase of wooden handicraft items.

to the worries of shoppers (Parasuraman, 1985; Kim & Lee, 2002).

The hypotheses for various constructs of extended TAM are proposed for the study and will be evaluated for significance.

Methodology

Questionnaire based study was conducted. Survey was designed in a structured and non-disguised manner where respondents were clearly told purpose of the survey and respondent's information will not be shared with anyone until they agree upon. Different e-commerce websites and websites of sellers were found out to gain understanding on the items included in the questionnaire. 8 variables (website quality, service perception, product perception, trust, PEOU, PU, attitude and intention to use) with 26 items were included in survey apart than general demographic questions. Variables were measured on a 5-point Likert scale, except demography related questions. Each measure was drawn from earlier studies and was adapted for current research. For questionnaire please refer to appendix.

Sample description

1000 people were sent e-mails of the questionnaire and 236 replied back out of these 234 were considered as usable, which comprises of 74 females and 160 males. Demography of respondents is mentioned in table 2.

Table 2: Respondents Demography

Measure	Item	Frequency	Percentage (%)
Total		234	100
Gender	Male	160	68.4
	Female	74	31.6
Age	Below 20	42	17.9
	20-30	132	56.4
	31-40	48	20.5
	Over 40	12	5.1
Occupation	Student	158	67.5
	Part Time Employee	7	3.0
	Business Owner	23	9.8
	Services	41	17.5
	Retired	5	2.1
Purchased wooden handicraft online	Never shopped	173	73.9
	Have shopped	61	26.1
Length of Internet experience	Under 1 year	2	0.9
	1-2 years	7	3.0
	2-3 years	19	8.1
	3-5 years	43	18.4
	5 years or more	163	69.7
Frequency of Internet Experience	1-3 hours/week	13	5.6
	3-10 hours/week	37	15.8
	10-20 hours/week	62	26.5
	More than 20 hours/week	122	52.1

Results and Analysis

Preliminary test

Table 3 depicts the results of exploratory factor analysis. Items with poor loadings (loadings < 0.50) were removed from analysis. Remaining items were assessed using principal component analysis (PCA) with promax rotation. PCA resulted in 8 factors (eigen values >1) which accounted for 71% variance. Reliability scores of all factors were found between 0.77 -0 .88 and are acceptable.

Complete latent model was created using results of exploratory factor analysis and tested with the help of AMOS to know relational as well as measurement properties of the model. Acceptable relative, comparative and absolute model fit indices were ensured using Bentler (1992) and Taylor and Todd (1995). 8 factor structures was confirmed by first order confirmatory factor analysis (CFA). Indices resulted in good model fit to data. Convergent validity was confirmed by average variance extracted (AVE $\geq$.50) for all the factors individually. AVE varies from 0.51 to 0.77, confirms convergent validity. Further confirmation of convergent validity was given by path analysis through structural equation modelling (SEM), and all path coefficients were found statistically significant. Discriminant validity is confirmed if AVE is greater than the squared correlation coefficient between factors, which was true for all the factor pairs (Fornell & Larckers 1981).

Structural Model Test

SEM was used to test causal relations amongst variables for the proposed model for complete data (N=234). Fit indices of the model were a good fit (χ^2/df=2.14; CFI=.97; RMSR=.04). Figure 2 depicts the path analysis model. These results gave strong support to the proposed model (Hair et al., 1998). Table 4 summarizes path analysis results with t-values. Relationships amongst all the causal paths were tested and confirmed resulting in acceptance of all hypotheses except PU$\leftarrow$SP. Other relationships proved significant like PEOU is positively influenced by website quality (WQ) (β = .532, p< .00) and it is the strongest of all relations. SP positively and significantly influences PEOU (β = .151, p<.005). Perceived Usefulness is positively influenced by product perception (β = .192, p< .003) and PU is significantly influenced by PEOU (β = .199, p< .002). Trust is significantly and positively influenced by PP (β = .208, p< .001). Results shows strong relation between TRU and SP (β = .152, p< .002); relation between TRU and WQ is one of the strongest (β = .523, p< .001). TRU on other hand acts as mediator and positively and significantly affects consumers attitude to use (β = .322, p< .001). ATT is strongly and positively influenced by PEOU (β = .489, p < .001) and PU (β = .151, p< .001) (Davis 1989). Lastly, relationship between Intention and ATT was found significant and positive (β = .252, p < .001).

Further analysis requires usage of advanced multivariate analysis method (Hayes, 2009) in SEM to perform model invariance test amongst female and male respondents data. Before invariance test is applied it is necessary to set up different models for both groups. Byrne (1994) recommended use of structural and measurement constraints to assess model equality. Two models are assessed, females (N=74) and males (N=160). Goodness-of-fit indices for both the models were found significant i.e. male (χ^2/df=1.7; CFI=.99) and female models (χ^2/df=1.9; CFI=.94). All causal paths were found significant in structural path analysis.

Table 3: Results of reliability and convergent validity

Constructs	Factor Analysis (PCA)	Cronbach's Alpha	Standardized Factor Loadings(λ)	Composite Reliability	Average Variance Extracted(AVE)
Product Perception 1	.686	0.773	0.762	0.799	0.571
2	.797		0.806		
3	.764		0.753		
Service Perception 1	.614	0.878	0.605	0.724	0.508
2	.754		0.738		
3	.815		0.756		
4	.737		0.499		
Website quality 1	.743	0.862	0.671	0.711	0.582
2	.733		0.628		
3	.710		0.573		
4	.725		0.596		
Trust 1	.707	0.838	0.590	0.859	0.611
2	.816		0.927		
3	.818		0.874		
4	.524		0.695		
Perceived Ease of Use 1	.867	0.872	0.816	0.874	0.698
2	.853		0.889		
3	.756		0.798		
Perceived Usefulness 1	.725	0.873	0.686	0.772	0.531
2	.846		0.811		
3	.757		0.686		
Attitude to use 1	.852	0.843	0.826	0.799	0.571
2	.851		0.739		
3	.811		0.699		
Intention to Use 1	.871	0.861	0.941	0.874	0.777
2	.880		0.819		

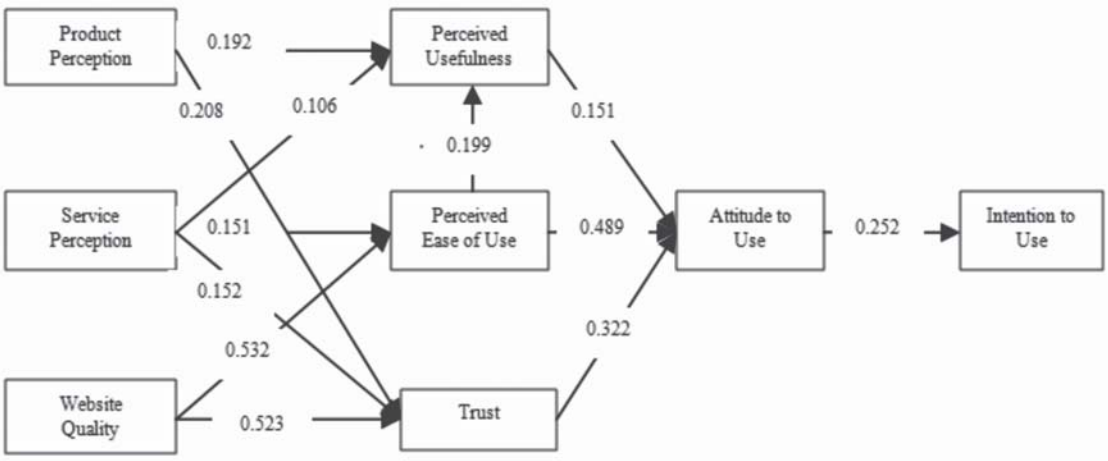


Figure 2: Path analysis

Invariance Test

One of the requirements of model test is difference in strength and nature of relationships amongst male and female groups. In consistency with expectations, six asymmetric paths originated from the baseline models (significant for females but not for males and vice-versa). PU⟵SP, PU⟵PEOU, ATT⟵PU and TRU⟵SP were found significant for males but not for females. PU⟵PP was significant for females but non-significant for males, rest all were significant for males and females both. These results will prove inconclusive if both genders do not perceive the results in same way. Inefficiency in establishment of invariance leads to rejection of scale as it is erroneous (Steenkamp and Baumgartner, 1998). Consecutively, model invariance tests are adopted prior to assessment of structural paths invariance. Model invariance tests includes all under mentioned models from Model 1 to 4 (Byrne, 1994).

Model 1: Configural invariance⟶ Factor loadings **(Z),** factor covariance (**¥**), and error variance matrix **(€)** all belong to same order, and are freely estimated without any restrictions in groups.

Model 2: Metric invariance⟶ **Z**(males)= **Z**(females), but **¥** and € are freely estimated.

Model 3: Factor covariance invariance ⟶ **¥** (males) = **¥** (females), but **Z** and € are freely estimated.

Model 4: Error variance invariance ⟶ € (males) = € (females), but **Z** and **¥** are freely estimated.

Model 5: Model 2 and 3 ⟶ **Z**(males)= **Z**(females), and $(males) = **¥** (females), but € is freely estimated.

Model 6: Model 2 and 4 ⟶ **Z**(males)= **Z**(females) and € (males) = € (females) but **¥** is freely estimated.

Model 7: Model 2, 3 and 4 ⟶ **Z**(males)= **Z**(females), **¥** (males) = **¥** (females) and € (males) = € (females).

Model 1 i.e. unconstrained or baseline model (least restricted) is nested with Model 2 to Model 7 as they are constrained at different levels, results are shown in table 5. Results were interpreted using Chi-square test which further helped in identification of best model with common dimensional properties. Model 2 ($\chi^2(18) = 32.79$, $p = .018$), Model 3 ($\chi^2(28) = 45.08$, $p = .022$) and 5 ($\chi^2(38)$

Table 4: Hypotheses Test

Hypothesis				Path Coefficient (β)	Error	t-value	p-value	Supported (Yes/No)
H 7	Perceived Ease of Use	←	Website quality	.532	.052	9.822	***	Yes
H 11	Perceived Ease of Use	←	Service Perception	.151	.059	2.786	.005	Yes
H 8	Perceived Usefulness	←	Product Perception	.192	.064	2.999	.003	Yes
H 1	Perceived Usefulness	←	Perceived Ease of Use	.199	.063	3.160	.002	Yes
H 10	Perceived Usefulness	←	Service Perception	.106	.067	1.715	.086	**No**
H 9	Trust	←	Product Perception	.208	.057	3.699	***	Yes
H 12	Trust	←	Service Perception	.152	.054	3.112	.002	Yes
H 6	Trust	←	Website quality	.523	.053	9.556	***	Yes
H 3	Attitude to use	←	Perceived Usefulness	.151	.039	3.469	***	Yes
H 2	Attitude to use	←	Perceived Ease of Use	.489	.045	9.788	***	Yes
H 5	Attitude to use	←	Trust	.322	.044	6.521	***	Yes
H 4	Intention	←	Attitude to use	.252	.081	4.080	***	Yes

*** means p-value = 0.000

= 37.83, p = .011) gave similar results to baseline model i.e. Model 1. Amongst these Model 5 was nested with Model 2 and Model 3. Comparison of these models show that Model 5 represents best common dimensional properties for both groups giving suggestion that factors have same patterns on factors, structure and covariance across groups. As shown in table 6, it was only during additional comparisons amongst models resulted in non-significant differences amongst them. Model 1 on metric and factor levels represented best properties for both groups, which suggests that both groups have nearly same factors patterns and structure covariance's for samples of groups. Invariance models were a good fit to the data, at χ^2/df = 1.17, CFI = .97.

Table 5: Test of measurement invariance between males and females (Multi-sample CFA)- Goodness-of-fit-indices

	Model	χ^2	df	p-value	CFI
Model 1: M1	Unconstrained	510.711	428	0	0.97
Model 2: M2	Factor Loadings Invariance	543.506	446	0	0.96
Model 3: M3	Factor Covariance Invariance	555.793	456	0	0.96
Model 4: M4	Error Variance Invariance	534.140	436	0	0.97
Model 5: M5	M2 and M3	548.550	466	0	0.97
Model 6: M6	M2 and M4	593.865	454	0	0.95
Model 7: M7	M2, M3 and M4	646.316	482	0	0.95

Table 6: Model Comparisons results

Model	Difference		
	Δ df	Δ χ^2	Δp
M1 vs. M2	18	32.795	0.018
M1 vs. M3	28	45.082	0.022
M1 vs. M4	8	23.429	0.003
M1 vs. M5	38	37.839	0.011
M1 vs. M6	26	83.154	0
M1 vs. M7	54	135.605	0
M2 vs. M3	10	12.287	0.026
M2 vs. M5	20	5.044	0.043
M3 vs. M5	10	7.243	0.030

To test equality of causal paths, invariance test requires stringent hypothesis testing with multi-group analysis of causal paths using structural model as shown in table 7 and figure 3. Equality constraints are imposed on the coefficients of both models (Byrne, 1994). PU←PEOU, where causal path is significant for males (β = .267, p <.001) but non-significant for females (β= -.027, p <.09) with negative relation and chi-square difference is also high. PU←SP, where causal path is significant for males (β = .191, p <.012) but non-significant for females (β = -.28, p <.344) with negative relation and chi-square difference is also high. PEOU←SP, where causal path is significant for males (β = .1, p <.013) but non-significant for females (β = .159, p <.16). PU←PP, where causal path is significant for females (β = .141, p <.53) but non-significant for males (β = .345, p <.003). As shown in table 6 these models were found different on different

constraints. In table 7 one tailed t-test shows relation PEOU⟵WQ asymmetric path significantly differs for both groups ($\Delta \chi^2$= 8.061, p <.05) i.e. groups considers relationship differently. Similarly One tailed t-test shows TRU⟵SP shows asymmetric properties ($\Delta \chi^2$= 4.833, p <.028), shows both groups considers relation differently. One tailed t-test revealed that groups considers TRU⟵WQ relation differently with chi-square difference ($\Delta \chi^2$= 13.398, p <.01).

Table 7: Invariance test across gender

H:Causal Paths	Standardized beta values (β) **		Path differences: Chi-square (p-value)
	Males	Females	
PEOU ←WQ	0.578(0)	0.418(0)	8.061(0.05)*
PEOU ←SP	0.100(0.013)	0.159(0.166)	0.04(0.95)
PU ←PP	0.141(0.53)	0.345(0.002)	0.116(0.733)
PU ←PEOU	0.267(0)	-0.027(0.819)	1.975(0.160)
PU ←SP	0.191(0.012)	-0.280(0.344)	2.192(0.139)
Trust ←WQ	0.581(0)	0.255(0.033)	13.398(0.0)*
Trust ←SP	0.171(0.003)	-0.050(0.634)	4.833(0.028)*
Trust ←PP	0.158(0.013)	0.388(0)	2.192(0.139)
Attitude ←PU	0.206(0)	0.231(0.006)	0.546(0.460)
Attitude ←PEOU	0.427(0)	0.489(0)	1.794(0.180)
Attitude ←Trust	0.360(0)	0.209(0.016)	0.829(0.363)
Intention←Attitude	0.480(0)	0.599(0)	0(1.000)
	χ^2/df = 1.17, p<.05; CFI = .97	χ^2/df = 1.18, p<.05; CFI = .96	χ^2/df = 1.17, p<.05; CFI = .97

** Asymmetric paths are shaded (which are no n-significant in one but significant in the other category).

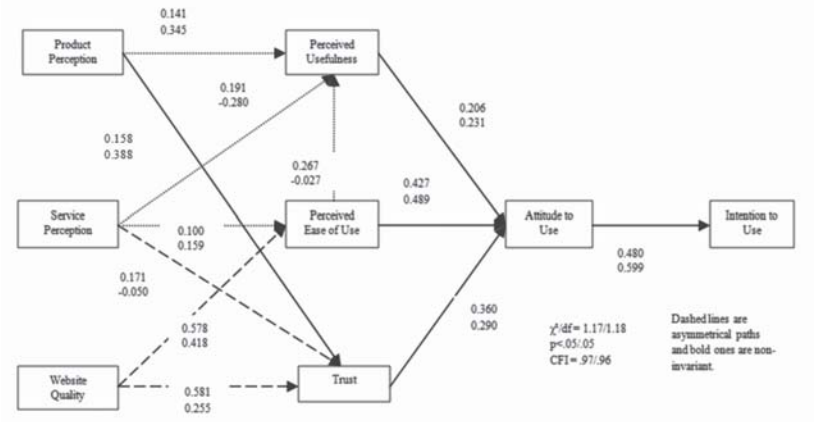


Figure 3: Invariance test across gender

Results and Findings

Website quality, product perception and service perception had a positive influence on intention as predicted in hypothesis. Relation between PU and PEOU was found significant and positive. Trust acted as a mediator in the model and was affected positively and significantly by website quality, product perception and service perception in return trust significantly affects attitude. Table 8 discusses results of invariance test between gender groups towards purchase of wooden handicraft items through online shopping.

Table 8: Description of relations

Description of relations		
Relations	Male	Female
PEOU←WQ	Website quality has positive and significant effect on PEOU for both the groups. Effects of useful description of items, good interface of website, easy navigation and better search mechanism adds to higher sense of ease in search, compare items and make final purchase decision.	
PEOU←SP	Customer's perception towards services rendered by e-commerce websites was found to be significant in path analysis. Both male and female group perceive better services by website and vendors leads to reduced effort in purchase of product on website. Better return, refund, customer-company communication and on-time delivery services leads to decrease in ease in search, compare items and make final purchase decision.	
PU←PP	Effect of detailed product information like product quality, availability and price of items leads to increased efficiency and productivity in online shopping of wooden handicraft items.	As per results females considered product features, quality, price and availability an important attribute while considering usefulness of e-commerce to purchase wooden handicraft items.
PU←PEOU	As per Davis (1989) ease in usage of a technology leads to increased usefulness. In case of male customers ease in usage of e-commerce towards online purchase significantly and positively affects sense of system usefulness. For male customers, better navigation, search and ease in transaction leads to reduced effort and time.	On the same lines, female group members perceives that ease of use of e-commerce system towards wooden handicraft items does not lead to increased usefulness perception of system.
Trust← WQ	Website features has different effects on both genders and presumed differently. Effect of website quality on increase in trust amongst females is lower than that of males i.e. effects of good interface of website, easy navigation and search mechanism adds to higher sense of privacy, security and purchase decision for males as compared to females. This result is in consistency with previously published results of Putrevu (2001, 2004).	
Trust← SP	Similarly relation between TRU←SP causal path was found asymmetric as chi-square difference was too high. Thus male group trusts a website and vendors/sellers more when better services are provided to them. Better return, refund, customer-company communication and on-time delivery services for males leads to higher sense of privacy, security and purchase decision.	In this relation, female group consider that better services does not leads to increase in trust on website usage and adoption. Instead females consider higher sense of privacy, security and purchase decision is not reliant upon better return, refund, customer-company communication and on-time delivery services.

Trust← PP	Both groups perceived better product features and product variety leads to increase in trust on vendors/sellers and website, therefore increase in shelf space towards wooden handicraft items with specifications leads to higher trust gained amongst users.
Attitude← PU	Similarly higher levels of PU and PEOU is assumed to bring positive change in attitude of usage of a technology and results have proved the same where both male and female groups considers that higher usefulness leads to increase in usage attitude of e-commerce towards purchase of wooden handicraft items.
Attitude← PEOU	
Attitude← Trust	Both male and female groups considers that increase or decrease in trust leads to similar change in attitude towards usage of e-commerce website for purchase of wooden handicraft items which leads to increased intention towards future purchase and recommendation of website usage to friends.
Intention← Attitude	

Hypotheses related to impact of website quality and psychological attributes towards consumers' online behavior for further recommendation and future purchase intentions towards wooden handicraft items were well supported by survey data. According to expectations independent variables drove website attitude and intention towards purchase decision of wooden handicraft items through online platform. Gender has proven to be a moderator to the model across all the variables and paths, as hypothesized.

Conclusions and implications

Product perception, service perception, website quality and trust are the constructs that most determined the intention of customer to purchase wooden handicraft items online. Further intention to use was driven by attitude that was driven by trust, PEOU and PU. Therefore most effectual websites are those which are trustworthy, have good product information, and are simple and easy to use for customers.

As wooden handicrafts are more of hedonic art and craft products, it was crucial to consider customer behavior towards product quality, availability and price for the study. As per results females considered product features and availability an important attribute while considering usefulness of e-commerce to purchase wooden handicraft items. These outcomes were reliable with past research recommending that females attempted more definite elaboration of product while shopping (Meyers-Levy and Maheswaran, 1991; Putrevu, 2001, 2004). Once they are satisfied with the wooden handicraft product information, trust, perception of usefulness of e-commerce website and its services which ultimately leads to recommendation and future purchase intention. Male group also found platform useful but less than female group when wooden handicraft items are available in abundance over e-commerce platform. Other studies acclaim the same, male customers take quick decisions, whereas female require detailed information when shopping online Wolin and Korgaonkar (2003).

As inferred from the results, it is crucial for males to trust website, services and product before making their final purchase. Trust plays a crucial as it escalates with increase in ease in navigation, better web content, better search, layout of webpage, delivery time given by vendor, ease in return and refund, vendor and website response, order timeliness. Higher trust means more purchase of wooden handicraft items by male group members. Also analyzed higher perception of services like delivery time given by vendor, ease in return and refund, vendor and website response, order timeliness leads to higher ease in usage of website and services

which affects usefulness of website and also attitude of customer towards final purchase and recommendation of wooden handicraft items.

As shown by results, males and females differed in their perception of website quality. Males only absorb information which is relevant to issue or need of the hour whereas females require detailed information before making their final say. Trust gained by website definitely means customers will purchase wooden handicraft items from websites. Males once trust a website with easy navigation and simple features they will definitely make their purchase. In case of females websites must be crafted to support exploratory behavior and allow access to detailed content information with attributes that stimulates attitude of the females as once attitude of female customer is made that leads to future purchase and recommendation intentions. As per the study, it can be concluded that a website for wooden handicraft items must be customized on the basis of gender. This is important as it affects both attitude and future purchase recommendations from both males and females.

Limitations of the study

The sampling procedure was a snowball test which restricted generalizability and external validity. Just like other Internet based studies, this study was skewed towards younger, more educated respondents. Reason being, such customers are primary crowd for online purchase. Although results were consistent with hypotheses, a bigger sample size may have lead to better results.

Future research

Future research must conduct more brand differentiation studies for handicraft and other products. This study can be utilized further to assess different culture, moods and cognition. As internet has become key channel for both information emission and sales of products, marketers will gain by understanding consumers' responses to content available on websites and effectiveness of channel.

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Appendix

Constructs	Items
Product Perception	PP1: Wooden handicraft items are available at competent prices. PP2: It is difficult to judge the quality of wooden handicraft items online. PP3: Large varieties of wooden handicraft items are available online.
Service Perception	SP1: It is easy to return wooden handicraft item purchased online. SP2: It is easy to get refund of wooden handicraft items purchased online, if an item is returned. SP3: A product is delivered on time. SP4: I get a quick response in case of a query.
Website quality	WQ1: User Interface of the wooden handicraft items page is well organized in appearance. WQ2: It is easy to navigate the website. WQ3: It is easy to find wooden handicrafts items on a website. WQ4: Useful description about wooden handicraft items is provided on a website.
Trust	TRU1: Privacy affects my decision to purchase wooden handicraft items online. TRU2: Payment security mechanism of a websi te affects the decision to shop wooden handicraft items online. TRU3: Reviews available online affect my decision to purchase a wooden handicraft item online. TRU4: Ease in payment of a website affects decision to shop wooden handicraft items online.
Perceived Ease of Use (PEOU)	PEOU1: It is easy to search for the wooden handicraft items online. PEOU 2: It is easy to compare wooden handicraft items online. PEOU3: It is easy to buy wooden handicrafts items online anytime.
Perceived Usefulness (PU)	PU1: The cost to buy wooden handicraft items reduces online. PU2: It saves time to buy wooden handicraft items online. PU3: It requires less effort to purchase wooden handicraft items online.
Attitude to Use	ATU1: It is a good idea to purchase wooden handicraft items online. ATU2: It is a wise idea to use e - commerce to purchase wooden handicraft items online. ATU3: It is interesting to purchase wooden handicraft items online.
Intention to Use	ITU1: I will make online purchase of wooden handicrafts items in next two months. ITU2: I will recommend online purchase of wooden handicraft items to others.

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Understanding Consumers' Inclination Towards Pepsi® Facebook Brand Page (FBP) Posts: A Sentiment Analysis Approach

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Abstract

The paper aims to study the sentiment of consumer towards the Facebook Brand Page (FBP) promotional campaign by FMCG brand Pepsi®. The study is first of its kind to use sentiment analytics on Facebook brand post in FMCG as most of the researches in the field are done on twitter sentiments. Sentiment analysis is an analytical approach for classifying pieces of text into clusters of text containing opinions on a certain topic/post/new etc. The purpose of the study is to determine the customer sentiment towards the posts by examining the emotional inference of the content on the targeted population. The data was collected from Pepsi®'s FBP using data mining tools, and sentiment of the consumers were analysed using various offline and online analytical tools. It was found that the individual sentiment of the posts was found to be fairly positive but when the overall results were estimated the combined sentiment of the posts were found to be negative. This study will help the marketers to understand the customer's emotional engagement and their inclinations towards the promotion/ brand.

Keywords: Sentiment Analysis, Facebook Brand Page, Social media, Customer Engagement.

Introduction

The role of social media platform has increased during the past few years as the buying behaviour of the consumer has been influenced by online brand communities, reviews about the product on social media platform and word of mouth (Eisenberg and Eisenberg, 2007; Cheung et al., 2012). Trust in a company or brand depends on communities and peers through social media and other digital channels and is no longer dependant on company-controlled, traditional, mass channels. Therefore, to reach and market products to these customers, brands have to allocate a significant marketing budget to digital and social media marketing.

This paper aims to study the effectiveness of social media campaign run by companies, it involves the study of various customer engagement practices followed by the company. The study focuses on attitude and behaviour of the consumer for evaluating the success and effectiveness of the campaign. The same was measured by using Sentiment analysis to assess the opinion of consumer towards a particular post or the brand. For the purpose of the study, food and beverage industry was focused upon, and social media activities of the leading beverage player Pepsi® were explored.

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The study is divided into four sections. The first section discusses brief introduction and overview of the social media and its utilization by marketer along with a basic introduction to Sentiment Analysis. The second section discusses the methodology followed in this study. The third section caries the Sentiment analysis and further discussions. The next section concludes the study with managerial implications and limitations.

Digital Media Landscape

Digital Media is defined as audio-visual media contents and applications that are distributed directly over the Internet. This includes digital video contents (e.g., movies, series and TV shows), digital music provided as download or internet-stream as well as digital games for different devices and electronically published content such as e-Books, e-Magazines or e-Paper (Statista, 2016). The Indian media & entertainment sector is expected to reach US$ 100 billion by 2025, from its estimated size of US$ 17.85 billion in 2015, due to its large capacity to consume new products and businesses. ScoopWhoop, an Indian digital media and content start-up, has raised US$ 4 million from Kalaari Capital and plans to use the funds for expansion of its video production unit called ScoopWhoop Talkies (ibef, 2016). Revenue in the "Digital Media" market amounted to 2,306.7 million USD in 2016. (Statista, 2017).

Numbers of Internet users are expected to grow much faster than TV viewers in the next five years. Internet Penetration in India is being driven by mobile internet usage (Tiruwa et al. 2016). High-speed internet connectivity across the length and breadth of the country is expected to enable more Indians to join the e-commerce and social media bandwagon and create a positive network effect for further growth. (mmaglobal, 2017). Digital ad spend is a collection of multiple marketing strategies ranging from search and display advertising, to e-mail, mobile and video ads, social, sponsored content and more recently SMS based advertising. As marketers continue to increase the focus on technologies to effectively reach the customer through a mix of these online platforms, digital spends are projected to increase too. Further, mobile advertisement spends, and social media aided digital video advertisement spends are expected to grow at 50.9% and 40% annually between 2016 and 2021 respectively (Brand Equity, 2017). Therefore, marketers need a way to measure the repercussions of these digital ad campaigns on various digital media platforms or to assess the need of deploying any such ad campaign by listening in on what consumers are saying about them.

Marketers at Social Media

A few years back, customer engagement was not a key focus area as brands were more focused on building their communities. But currently the marketers and brand have shifted their focus to Building Brand Awareness, Building a Community and Customer Engagement on social media platforms. (Anderson, C. 2006; EY, 2014). About 81% of the brands considered Facebook to be the most important platform, while almost 48% of surveyed brands think that Twitter is the second-most important platform to be on, closely followed by YouTube (43% surveyed brands considered it to be the third–most important channel) (EY, 2014). Businesses are also establishing their own YouTube channels while actively producing and distributing video content for promotional material and showcasing new developments for the brand. Most of the marketers prefer creating a 360° integrated campaign and then extending the mainline campaign on social media. To add to this change in thinking, media-savvy social brands also prefer campaigns exclusively designed for social media. Designing a campaign just for Facebook and Twitter is on a major decline at just 10.53%. (EY, 2014).

With increasing awareness of the social media as a platform to engage, new business models which have integration of social media with a focus on interactivity and customer connectivity

and their objective being influencing current and potential customers, through content conjoined with the technology of Web (Kietzmann et al., 2011, Yadav, 2015; Tiruwa et al., 2016). Marketers are now aware of the benefits of integrating social media into their businesses and are currently using social media strategies to reach the masses. Marketers have recognized the need to keep a close watch on such brand communities and have started to integrate the use of brand communities owned by them on various SNSs (Constantinides et al., 2008). Such sites provide tremendous opportunities to marketers so that they can understand the customers' attitude and keep them engaged with the brand and its products.

Sentiment Analysis

Including Social media platforms as part of the integrative promotional business strategy is not enough, but measuring its effects is important too. Social media like Facebook comprises of user data in the forms of comments, likes, and shares. This big data can be utilized to understand whether the social media marketing or engagement is having some effect on engaging users or not. Sentiment analysis is one such field that analyses people's opinions, sentiments, evaluations, appraisals, attitudes, and emotions towards entities such as products, services, organizations, individuals, issues, events, topics, and their attributes (Lexlative, 2017). It refers to the general method to extract subjectivity and polarity from the text. Sentiment analysis is also known as opinion mining, and it refers to the use of natural language processing, text analysis, and computational linguistics to identify and extract subjective information in source materials. It also encompass the extraction, identification, or characterization of the sentiment content of a text unit. It is widely applied to reviews and social media for a variety of applications, ranging from marketing to customer service. (Mozetiè et al., 2016). Opinion mining can be useful in several ways. It provides companies with a means to estimate the extent of product acceptance and to determine strategies to improve product quality. The sentiment found within comments, feedback or critiques provide useful indicators for many different purposes (Condliffe, 2010). It facilitates policy makers to analyse public sentiments concerning policies or public services. (Cambria et al., 2013).

It can help marketers evaluate the success of an ad campaign or new product launch, determine which versions of a product or service are popular and identify which demographics like or dislike particular product features. For example, a review on a website might be broadly positive about a digital camera, but be specifically negative about how heavy it is. Being able to identify this kind of information systematically, gives the vendor a much clearer picture of public opinion than surveys or focus groups do because the data is created by the customer (Ramarjun et al., 2016). Sentiment analysis evaluates statements found across various social platforms to determine whether they are positive or negative with respect to a particular brand. A firm might track sentiment analysis over time to: 1) determine whether their actions improve or damage sentiment; 2) track brand reputation; 3) test how marketing efforts affect attitudes toward the brand; 4) attitudes toward new products (Hausman, 2013).

Research Methodology

Significance and Scope of Study

The significance of the study is to examine the importance of brand sentiment analysis. The focus is to analyse various posts and campaigns initiated by Pepsi® on Social Media Platform Facebook. The study aims to understand the sentiment of the population engaging on these posts from the lexicon based sentiments analysis on the user comments on the different types of posts on the Pepsi® Facebook Brand Page (FBP).

Research Design

Research design specifies a framework for conducting the research work. Kozinets (2009) proposed two options for data collection: collecting online posts for sentiment analysis, or observing group interactions occurring within the online community and taking notes from the observer's perspective. For identifying customer sentiment about the campaign of Pepsi®, a food and beverage company, publicly shared Facebook posts and users comment on the same were collected and processed.

Research Technique

Sentiment analysis was conducted by analysing the different type of content posted by companies on their Facebook page, and a set of commonly used set of positive, negative and neutral words were identified. Collected data is cleaned in excel using Sementria®, a plugin for Microsoft Excel®. Visualization and the analysis of the comment sentiments were done on Tableau®. Further, Word dictionary is created which depicts the words or the phrases used frequently and are categorized as positive and negative words.

Population and Sample Size

Population under study includes all the males and females who follows the Pepsi® FBP and the entire friend list or followers of these users. Sample size includes the active users who posted content on the various posts of the brands.

Data Collection

Online posts were collected using the online tool provided at www.84code.com and is exported into .csv format. The unstructured data content was cleaned and processed for the further analytical purpose. The comments of users who have liked the FBP were captured. Data was collected from September to October 2017. During this period Pepsi® posted content relating to India-Australia Cricket Tournament and encouraged users to post pictures with Pepsi® to win a chance to meet the Indian Cricket Team Captain Virat Kohli. Since the duration of this tournament was overlapping with the festive season of Diwali, the brand page also posted content relating to the festive season.

Research Tools

The Research Tools used for conducting the study includes Facepager®, Microsoft Excel®, Sementria® for Excel® and Tableau®

1. **Facepager®** - Facepager® was made for fetching publically available data from Facebook, Twitter, and other JSON-based APIs. All data is stored in an SQLite database and may be exported to .csv format. The data was extracted from Pepsi® by providing username provided in the URL which acts as object for Facepager®.
2. **Microsoft Excel® -**Microsoft Excel® is a spreadsheet developed by Microsoft for Windows, Mac OS X, Android, and iOS. It features calculation, graphing tools, pivot tables, and a macro programming language called Visual Basic for Applications. The data exported to CSV format is cleaned using Microsoft Excel®.
3. **Semantria® for Excel® -** Sementria® for Excel is developed by Lexalytics®. It provides a fast and accurate categorization of data into the positive, negative or neutral tones embedded in content. It attaches sentiment score to each theme, phrase, and entity. Sementria® plugin was installed to analyse the sentiment of consumer towards the social media campaign and the brand.

4. Tableau® - Tableau®, developed by Tableau® Software, is software used for business intelligence and analytics. It produces a family of interactive data visualization based on data. The structured result produced after processing data using Sementria® was analysed in Tableau®.

Data Analysis and Findings

Sentiment analysis was incorporated by analysing posts of various kinds posted by companies on their Facebook page. Content posted by company on their respective pages can be classified as of type- photo, video, status, link, and event. Post of each category was selected, and analysis was performed by capturing the comments by the users who have liked the Pepsi® FBP. Pepsi® was able to grab the attention of its targeted audience by posting the content frequently, and most of the content posted used hash tag and was related to contests. The analysis of various posts shows that customer engagement was done very well and can also gain no of followers and likes in future.

Post 1

The post analysed was of the type- photo; it received 73K no of likes and was shared by 154 users. Table 7.1 shows the calculated value of sentiment for each comment. Document sentiment indicates the value of the sentiment and document sentiment +/- indicates the polarity.

Table 7.1: Sentiment Score and Polarity for Users Comment- Pepsi®- Post 1

Document Sentiment	Document Sentiment +/-	User Comments
0.510517299	positive	#IndVsAus i hope to win. I love Pepsi
0.600000024	positive	#WithPepsi i I love Pepsi
0.522114933	positive	Don't worry be happy, drink Pepsi® and feel good
0.470775872	positive	Drink Pepsi feeling happy nd win d match virat
0.465775877	positive	#IndVsAus I HOPE ME WIN AND MEET VIRAT
0.441551745	positive	won with Pepsi..hahahaaha
0.600000024	positive	#WithPepsi...i love Pepsi
0.441551745	positive	won with Pepsi
0.650000036	positive	excellent..outstanding…lovely Pepsi
0.600000024	positive	love virat
0.514800012	positive	best of luck to u and ur team for next match against Aussies
0.49000001	positive	Best wishes to one and all #Pepsi
-0.050000012	negative	bad for health
0.52125001	positive	nice nicely
0.5	positive	#With Pepsi. feeling happy
0.5	positive	Nice pic virat kohli superrrrrrr
0.5	positive	Good
0.441551745	positive	won with Pepsi
-0.600000024	negative	Nonsense
-0.600000024	negative	Pepsi is bad

Figure 7.1(a) depicts the average value of the positive and negative value of comments. Tableau® was used to plot the box plot. The plot represents that consumers have neutral opinion but with alignment towards positivity for the post. The post has average sentiment value of 0.095.

Frequently used phrases and keywords used in comments were identified and classified as positive and negative based on the opinion of the consumer on the post. Table 7.2 represents the keywords as per the sentiment category.

Table 7.2: Classification of keywords as positive and negative sentiment

Sentiment	Keywords
Positive	love, win, hope, win, won, best, good, happy, awesome
Negative	Bad, unhealthy, nonsense, damages

The consumers had slightly positive opinion about the campaign and posted their selfies with Pepsi® bottle in the comments. #IndVsAus was used with along with the photos posted. Although few consumers did not find it good, overall sentiment was positive.

Post 2

The post analysed was of the type - status; it received only 93 no of likes and was shared by only 3 users. Table 7.3 shows the calculated value of sentiment for each comment. Document sentiment indicates the value of the sentiment and document sentiment +/- indicates the polarity.

Table 7.3: Sentiment Score and Polarity for Users Comment- Pepsi®- Post 2

Document Sentiment	Document Sentiment +/-	Comments
0.5	positive	feeling happy with Pepsi
0.60000002	positive	#SayItWith #Pepsi love #Pepsi #WithPepsi..
0.54946554	positive	Pepsi mojo what a nice game i hope i win a chance and have fun with virat kohli
0.60000002	positive	#Pepsi I love it #WithPespi. my first selfie
0.60000002	positive	#Pepsi love
0.5	positive	Yo Pepsi is #feeling_happy
0.44155175	positive	#WithPepsi drink Pepsi and win

The box plot represented in Figure 7.1(b) indicates that consumers had positive opinion for the post. The sentiment value for the post analysed was 0.54. No negative keywords were identified. Frequently used phrases and keywords used in comments were identified and classified as positive based on the opinion of the consumer on the post. Table 7.4 represents the keywords as per the sentiment category.

Table 7.4: Classification of keywords as positive and negative sentiment

Sentiment	Keywords
Positive	love, win, hope, win, won, best, good, happy, awesome

The consumers had positive opinion about the campaign and posted their selfies with Pepsi® bottle in the comments. Comments showed excitement towards the campaign. It can be inferred that contest would be able to attract and engage customers.

Post 3

The post analysed was of the type - video; it received 1.9M likes and was shared by 800 users. It received 439K views. Table 7.5 shows the calculated value of sentiment for each comment. Document sentiment indicates the value of the sentiment and document sentiment +/- indicates the polarity.

Table 7.5: Sentiment Score and Polarity for Users Comment- Pepsi®- Post 3

Document Sentiment	Document Sentiment +/-	Comments
0.584438503	positive	creative advertisement
0.49000001	positive	This always make me smile
0.600000024	positive	#HappyPepsi #Pepsi
-0.600000024	negative	nonsense
0.564999998	positive	loved it
0.800000012	positive	#HappyPepsiToYou #HappyDiwali
-0.75	negative	Poison is out.
0.588333368	positive	I liked cool can
-0.600000024	negative	nonsense
0.600000024	positive	Nice ad
0.564999998	positive	loved it
0.5	positive	nice song

Figure 7.1(c) depicts the average value of sentiment of comments. Even though positive comments were more as compared to negative in number, the presence of an almost equal number of neutral comments diluted the positive comments. Also, the phrases and the words used in negative comments were more negative as compared to the positive comments. Therefore, consumers have slightly negative sentiment towards the post as also depicted by box plot. The post has sentiment value of -0.09.

Table 7.6 represents keywords categorized as per the sentiment category. Frequently used phrases and keywords used in comments were identified and classified as positive and negative based on the opinion of the consumer on the post.

Table 7.6: Classification of keywords as positive and negative sentiment

Sentiment	Keywords
Positive	love, enjoy, nice, super
Negative	Nonsense, poison, bad, not good, confusing

The consumers had slightly negative opinion about the campaign.

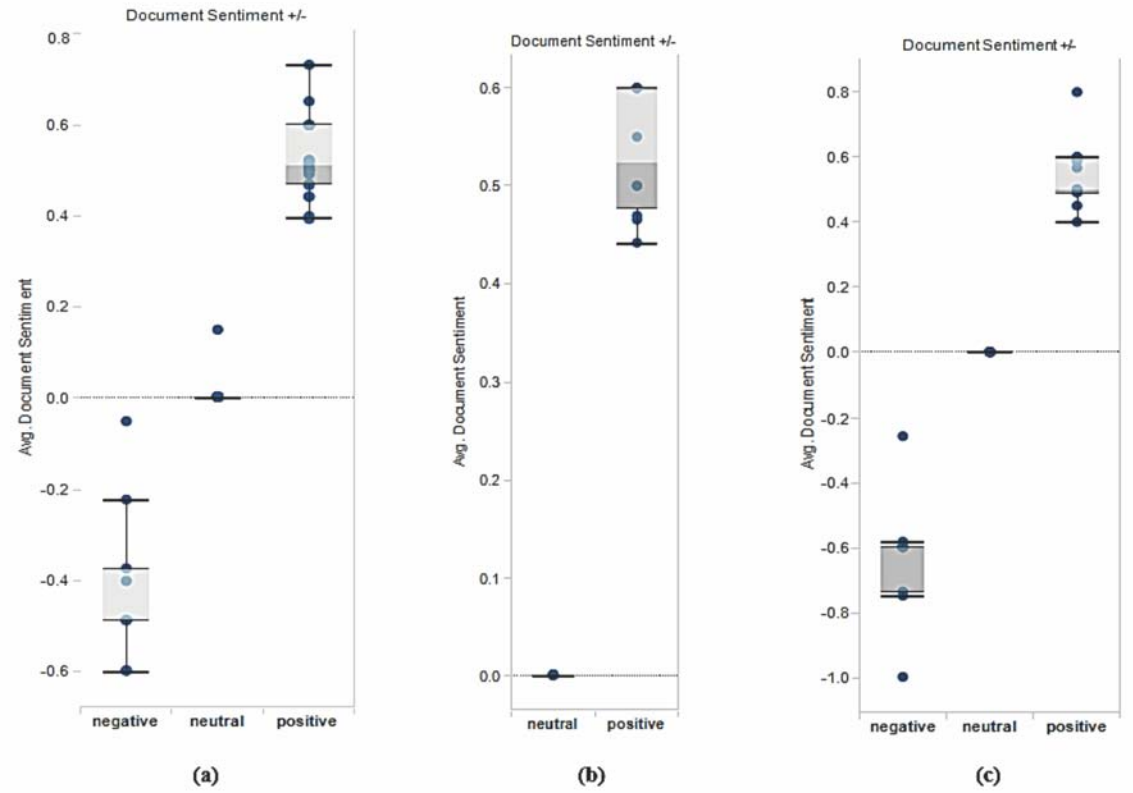


Figure 7.1: Box Plot for he analysed posts – Post 1, 2 and 3

Overall Analysis

Pepsi® had been able to manage the promotions and campaigns very well; the reason for the same being its association with Indian Cricket team during the India-Australia Series and the no of contests and customer engagement activities (Pepsi® India, 2016). Pepsi® keeps the campaign alive by posting content about the same campaign for few days continuously in various forms. Introduction of a new product like a mini can or pet bottle with emoji label was done through various activities and contests. This promotes the sales of the new product; target audience increases as friends of the followers see the activity in their respective Facebook feeds.

On analysis of 3 posts of Pepsi®, posted during the month of September-October, the overall performance in engaging followers of Pepsi® appears to be good. The attitude of consumer remained positive in maximum cases and negative only in case. The comprehensive sentiment calculated comes out to be slightly positive with a value of 0.022. Entities that occurred frequently includes- Pepsi, PepsiCo, #WithPepsi, #IndVsAus, #HappyPepsiToYou.

Table 7.7: Summary of the analysis of the posts

S.No.	Measure	Pepsi®
1.	Polarity	Positive
2.	Sentiment	0.022
3.	Max liked post	Photo
4.	No of likes	73K
5.	Max shared post	Video
6.	No of share	800
7.	Most positive post	Status
8.	Value	0.54
9.	Max commented post	Photo
10.	No of comments	198
11.	Video	-0.09
12.	Photo	0.095
13.	Status	0.054
14.	Link	0.15
15.	Frequency of Positive keywords	76
16.	Frequency of Negative Keywords	27
17.	Top positive keywords	Love, win, hope, nice, loved, awesome, enjoy, happy, best, super
18.	Negative keywords	Bad, hate, nonsense, mad, poison, confusing, damages, not good, irritating, unhealthy
19.	Entity identified	Pepsi, #Pepsi #WithPepsi, #IndVsAus, #HappyPepsiToYou
20.	Entity sentiment	-0.52

Figure 7.4 represents Word Cloud; it indicates the positive, negative and neutral phrases. The size indicates the average value of phrase sentiment and colour indicates the polarity, green being the positive and red being negative.



Figure 7.2: Word Cloud for the most frequently used words in the Facebook posts

As per the analysis of the posts, an observation made indicates that user does not comment on the content related to posts; instead, in most of the cases express an opinion about the product or the theme. Indian Cricket Team or player or a Bollywood actor featuring in the advertisement could be an object for discussion. The attitude towards the post holds valid only in the case where marketers promote the post as a contest. Some people relate the product as an unhealthy drink which should not be consumed. While some consumers find it as a source of happiness and fun. In case of Pepsi®, the average value of sentiment for the post is positive. On analysing, entity sentiment which depicts the true opinion of consumer towards the product, the value comes out to be negative for Pepsi®.

Discussion and Conclusion

The study indicates the opinion of consumers for FMCG sector with FBP of Pepsi® as the subject of study. The analysis of the posts indicates that followers comment on the content is not directly related to the topic of the content in most of the time, the comments relate to the celebrity featuring in the post or old jingles of the brand were used. Negative attitude mostly concerns with ill-effect of product on health and based on that users show displeasure. Similarly, the consumers who finds the product tasty, indicates the love for the brand, hence a positive opinion was observed. Only few users post content related to the post. The opinion about posts is mostly reflected in case of contests and videos followed by events. Out of all types of post-status, photo, video, link and event; sentiment related to the content was observed in case of video. Finally, the majority of the negative comments were related to Pepsi® being unhealthy and not fit for consumption. The brand needs to address the same with better campaigns to restraint customers perceiving their product and brand as not harmful to health. Pepsi® could post some content related to the product in the form of info-graphic educating people about the product and brand. Also, with that, some campaign showing social responsibility towards the society.

The study indicates the sentiment towards each post and company as an overall entity. It was observed that the Pepsi® received positive sentiment in most of the cases. It was noted that Pepsi® posted inter-related content frequently which continuously engaged the customers Pepsi® also received negative sentiment at the entity level, therefore, as per the recommendations Pepsi® can work on customer interaction more, converting the negative sentiment into a positive one.

Managerial Implications and Limitations

The information from sentiment analysis help to gain useful insights about the product like the product seems to be unhealthy. Therefore, the company should position itself accordingly. The marketers should build content to encourage users to engage and participate. The focus should be on the contest and videos, as videos and content attract the audience and the comments made relates to the topic of content. Different type of content for the same campaign should be updated on the page more frequently, as it increases the follower engagement with the brand. Another important understanding from the study is that consumers should be encouraged to use hash tags to be eligible for the contest. This would motivate followers to comment related to the post and not their individual random thoughts and also create buzz for the brand as a tending topic on the internet.

The study was focused solely on FMCG sector, and only one FMCG brand was considered for data collection and analysis. There is a plethora of social media platforms where both people and brands are actively participating; this study was limited to SNS Facebook. Software tool Facepager® has a limitation that it cannot retrieve 500+ comments at a time for a given post

thus we can say that analysis was based on the limited data. The software which analysed the comments was restricted to analyse only English language so there might have been instances where comments written other than English were not considered fit for analysis. The demographics of the users cannot be established and taken into consideration while analysing the data. There is future scope for the study regarding a comparative study between two similar brands in different social media platforms.

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Factors Affecting Adoption of Digital Payment Systems: A Case Study on Allahabad City, Uttar Pradesh

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Abstract

After the demonetisation of currency in India, there has been rapid change in the area of payment systems. The purpose of this paper was to investigate on the factors that influence adoption electronic payment systems in Allahabad City and recommend a model for effective adoption of digital payment systems. A mixed research approach was used to fulfil the objective of the study, that emerge through the review of existing literature and Expert opinion from the related area of digital payment systems in Allahabad. The study was conducted on the basis of Technology-Acceptance-Model (TAM) and Porters' Five Force Model. At the end of the study it is concluded that, the effective factors of digital payment systems are; lack of ICT infrastructure, security, lack of trust, lack of digital literacy and habit of use traditional approach of payment. The study suggested a series of measure which could be taken by the experts of the related area as well as the related review. These measures provide the recommendation for effective adoption of digital payment systems.

Keywords: Digital Payment System, Technology Acceptance Model (TAM), Critical Success Factor (CSF), Electronic Commerce.

Introduction

A payment system is set of banking procedure, instruments and fund transfer between two banks or financial institutions that ensure the virtual circulation of currency. The Bank of International Settlements (BIS) indicates that, "Payment system is a set of instruments, principals and procedures for transfer of funds among the user of the system. It is an agreement between a defined group of users and the operator of the system and the transfer of fund is made through a digital infrastructure". Whereas, a cashless transaction refers to the circulation of currency over the internet, with the help of electric devices. It is a hypothetical stage or situation in favour of alternative means of exchange. All the transactions are done with the help of plastic cards, mobile wallets, and other digital medium with minimal or no physical circulation of currency. Cashless transaction discussed widely especially after demonetization because the world is experiencing a rapid and increasing use of digital methods of transaction. The transactions which would historically have been undertaken with goods (in barter system), and cash are often now undertaken electronically through electronic devices and medium like, credit cards, debit cards, money wallets, IMPS, RTGS, NEFT etc. The effectiveness and reliability of the payment systems contributing in the economic efficiency as transfer of fund from customers' account to beneficiary account. According to (Shon & Swatman, 1998) an exchange of funds

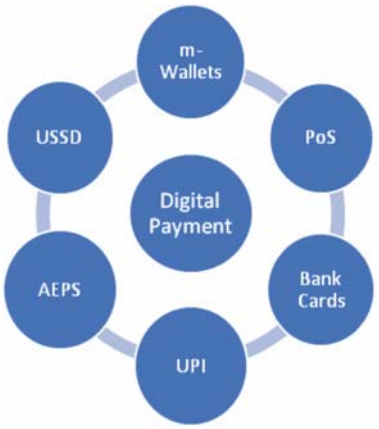
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initiated via an electronic communication channel, or payment through signals linked directly to deposit or credit accounts (Gans & Scheelings, 1999). However, with the help of literature review we can addressed that the term payment system is a complete set of instruments, intermediaries, rules and regulations, procedures, and a system which facilitate the circulation of currency in the country or country area.

Payment system facilitating the economic transactions and circulation of funds becomes an important factor for the development of economy. The payment system also helps in the effectiveness of monetary policy, in the development of goods and services market, and the stability of financial and monetary system. The acceptance of digital payment services has been rapid in many part of the world and around 50 per cent increase in the usage of e-banking in leading countries (Tero Pikkarainen, 2004). According to the study the probability of spending habits increases with the usage of digital payment (Prelec & Simester, 2001; Soman, 2001; Soman & Cheema, 2002) which increases the spending amount also (Prelec & Simester, 2001; Soman, 2001) and the consumer habits also affected by the modes of payment (Chartterjee & Rose, 2012; Prelec & Simester, 2001; Soman, 2001; Soman & Cheema, 2002). Hence, there are huge options of digital payment in India. The government also support with different schemes like, Digital India, Make in India, BHIM App, Bharat QR Code etc. With the new technology and extending variations on the traditional payment system from barter system to mobile payment consumer and organisation have begun to adopt digital payment methods specifically towards digital transformation of the country. But still there is lots of untouched internet area which are lacks of Internet facility due to various reasons. This paper tries to fill this gap with identified factor of digital payment.

This paper is a primary framework for studying the adoption of digital payment systems and analysing strategies of current market actors, such as banks, mobile network operators, merchant etc. Factors were identified with the help of extensive literature review and substantial studies which claims to be useful in this respect. With the help of current study, we aim to integrate different constructs related to methods of digital payment and factors influencing digital payment system in India. This paper also attempted to confirm the implementation of digital payment systems as a means of facilitating online transaction through model.

Methods of Digital Payment Methods in India



According to National Institute of Transforming India (NITI Aayog), Government of India, there are six methods of digital payment systems in India. Payment methods that are not only based on the internet connectivity but also on the basis of basic featured Global System for Mobile communication (GSM) based mobile phone, these methods are: Mobile Wallets (m-Wallets), Point of Sale (PoS), Bank Cards, Unified Payment Interface (UPI), Aadhar Enabled Payment System (AEPS), and Unstructured Supplementary Service Data (USSD). Evolution of Internet banking through Credit Cards in the year 1940 followed by Automated Teller Machine (ATM) (1960) and Debit Cards (1970), plastic cards has been come into picture as a medium of digital payment systems. That was the era of plastic card in India. In late 1980s India achieved another milestone in the history of digital payment systems as online banking and PayPal. PayPal was the US based company which send money through email address from sender to the receiver. With the help of online banking end user doesn't depend

on the plastic card and make transaction through laptops and desktops. Banking through Smartphone comes into picture in the year 2000 where users easily make payment through their internet based mobile phones. During 2002-2015 private competitors come up with new mode of mobile payment called wallets. Mobile wallet is a way to make payment through Smartphone without using physical plastic card. User can make through Person to Person (P2P) mode where customer transfer funds from one account to another account via internet. Near Field Communication (NFC) is an advanced contactless technology that allows two devices like Smartphone and a payment terminal to talk each other within a close environment. User can also make payment through electronic cheques with the help of mobile devices.

Theoretical Framework of Technology Adoption

From the available theories of Technology Adoption we selected Technology Adoption Model (TAM) as a part of our research. TAM is one of the most widely used theories for technology adoption. The criteria of selecting the theory were the ability to represent the true picture of our research on factor identification of digital payment systems. To put user value perceptions into the context of new service and to derive the meaning managerial implications we also create a mode with the help of porters' five force model.

TAM is a theory that explains the user adoption of technology at the organisational level. The theory provides belief about the new technology, use of technology, intention to use, and usage of technology (Heijden et al.,2003). According to Devis (1989) and Devis et. al. (1989), Perceived usefulness and Perceived ease of use are the beliefs that helps to predict attitude which influence intended to use technology. (Dwivedi et al, 2017). The technology which enhances the performance and productivity in the workplace are the perceived usefulness and perceived ease of use is the degree of effort needed to the adoption of technology. The key element of TAM is Behavioural Intent (BI) which leads to the desired actions of the researcher to use IS. TAM is a vigorous model that is frequently used to study acceptance of information communication technology (ICT) (Forman & Goldfarb, 2006). According to Gibbs et al. (2007), TAM is information theory which is used to understand the adoption and use of technology. This theory also helps to understand the policy maker and adopters come to accept and reject the use of ICT in business.

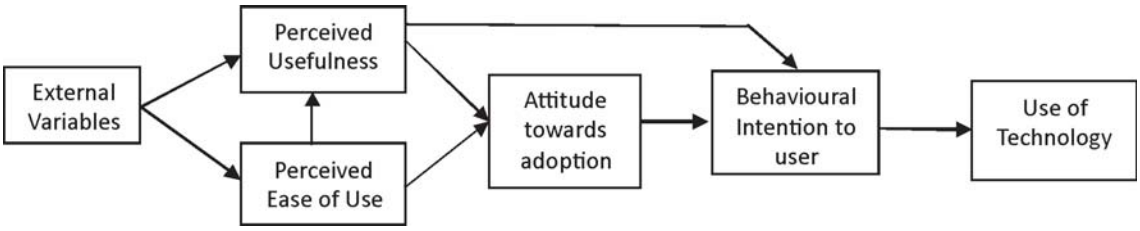


Figure 1: Technology Adoption Model (TAM)

According to Jayawardhena & Foley (2000), changes in factors like technology, culture, commercial and legal with the commercial forces of services market drives the development of financial services. Whereas, Javalgi & Ramsey (2001) proposed that IT & telecommunication, socio-cultural, commercial and legal (government) factors impact the diffusion of global e-Commerce. We made the modified model, so that framework describes the better meaning of adoption of digital payment systems. In the given model fig. 2, Merchant involve in promoting the digital payment systems through various Government policies are the "supplier power", consumer power are the (buyer power), alternate payment services ie. Traditional services are

the "barriers to entry", and new e-payment services are the "substitutes" of the model. Thus, the resulting model incorporates the contingency factors with the five force model of Porter (1998).

Four factors in the framework, ie technological factor, Socio-cultural factor, economical factor, and Legal (Government) factor are uncontrollable individual market participants. Hence these factors are known as "Contingency factors". Other five factors of the framework are known as the "Competitive factors" which are describing the main competitive forces of digital payment systems.

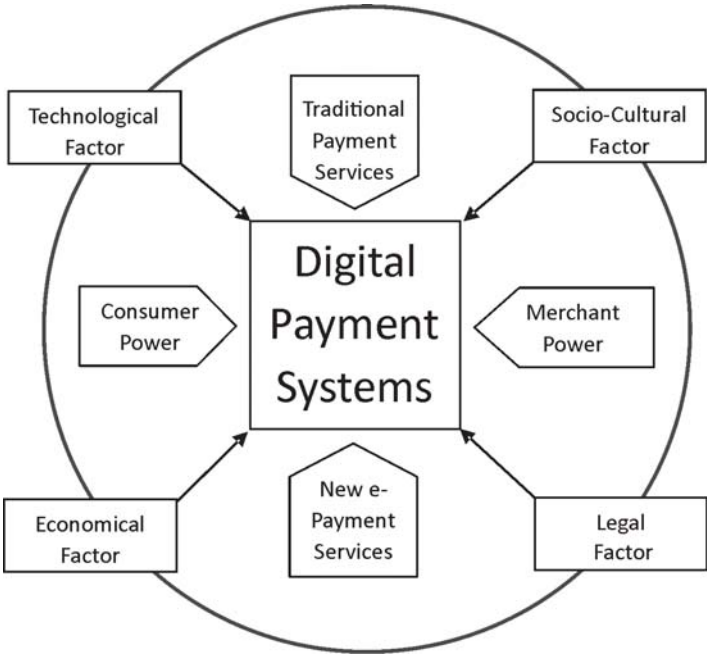


Figure 2: Factors framework impacting the Digital Payment Systems

From the figure 2, it is evaded that the overall framework of digital payment model covers all major aspect of the market. There are consumer and merchant power which we can say that the controllable/individual power and traditional and new e-payment services as uncontrollable/ organisational power. The four types of factor ie Technological, Socio-culture, Legal and Economical factor affect the system the individual as well as organisational environment of digital payment systems.

Case Study of Allahabad City

According to census 2011, Allahabad has the highest populated city of Uttar Pradesh with the population of 5,954,391. There are total 71 districts in Uttar Pradesh. Allahabad is situated at the confluence of three holy rivers of India namely River Ganga, River Yamuna and River Saraswati. Allahabad is also known for one of the best academic ambience, there are six national level Institutes/Universities including NIT Allahabad and Allahabad Central University. In comparison to Indian literacy 74 percent, it has 72.32 percent of literacy rate. Apart from the academic milestone Allahabad has oldest High Court of India. By interview of the expert from different domain about the digital payment it is observed that, digital literacy play an important role to accelerate the adoption of digital payment system. People on higher position of their

organisation don't use digital mode of transaction due to; lack of digital literacy; security reasons; lack of infrastructure; lack of trust etc.

Finding and Conclusion of the Study

The purpose of our paper was to review the previous study on digital payment systems to analyse different factors that impact on the adoption of digital payment systems, and to give direction to the future research in this emerging field. A framework was proposed with four contingency and five competitive factors used to categorise the literature review.

Contingency factors in the framework represent the external factors that are influence the digital payment systems in the Indian market. On the basis of our findings the four contingency factors influence the major part of the market.

CF1: Socio-cultural factor are the important factor for the adoption of wirelss and online transaction medium (Bohle & Krueger, 2001; Sundqvist et al., 2002; Mahmood et al., 2004). The sub-factors covers under this category are economic conditions of the country, traditional payment culture and trust on payment methods.

CF2: One of the least studied factors in the domain of digital payment systems is legal and regularity factor. Lack of contemporary research in this area keeps this area unexplored.

CF3: The economic structure of the payment system is quite unstructured. There is no tracking system of cash transactions. Hence online payment systems are needed, so that government easily track the currency in the market.

CF4: Innovations and advancement in the technological environment have driven the development the digital payment systems in India. This is the most examined area by most of the researchers (Antovski & Gusev, 2003; Kungpisdan et al., 2004a; Me, 2003; Pradhan et al.,2005).

Competitive factors describe the different players and their relative power to influence the digital payment systems. On the basis on related literature review there are four factors has been listed as a competitive factors of digital payment systems.

CF5: Although consumer has habit to use the traditional payment method however, that consumer easily influence on the development of new technology for digital payment. New payment services contribute to their success and may currently be insufficient.

CF6: Merchants play an important in the area of payment systems both as adopter and the promoters of the new payment system. There are few more studies which are examined the role of merchants as an adopter of new technology (Mallat & Tuunainen, 2005).

CF7: The success of new technology on traditional systems is a positioning of the new systems. Present payment system suffers with the infrastructure and security problems so that the traditional systems easily dominate on the new technology systems. Further, several research show the development trend in the area of digital payment systems and identify the opportunities for digital payment systems in India.

CF8: The factor that is contributing low success on digital payment systems is a market of consumer. Consumer affects the market by its habits, likes and dislikes. Although consumer is an important part of payment market. The main aim of the organisation is to target the ultimate consumer, so the predetermined target of the organisation achieved.

The findings of this paper evident that the importance of digital payment system as an important electronic transformation activity. This paper identified critical success factors and sub-factors which are relevant for effective adoption of digital payment system in India with the help of

porters' five force model. Findings also demonstrate eight factors in which four are contingency factors and others are competitive factors. Factor provides the points which are responsible for success and failure of digital payment system is India. Paper discussed the problem and barriers of digital payment system in India. According to the past studies, demographic variables can have an impact on digital payment (Banerjee et al., 2005) but few studies (Sevgi Özkan, 2010) ignored the impact of demographic variable on e-payment. The authors present their views and recommendations related to key factors and suggested the major barriers among those factors facing by the customers during the transaction process. The research also provides a success model develop on the basis of factors. It also included validation of the model with the help of experts from the academicians of relevant field. There are some unsolved issues which need to be further discussion but due to the limited scope of this study, the issues related to technical as well as political aspect of the country.

Implications of the Study

Globalization and integration of the Indian markets with the growth in the private capital flow have motivated the policy maker/government to revise and reform the payment system with the settlement of security to ensure the effective and opportunely transaction. The study is contended to represent an important contribution related to theoretical deliberations and analysis of factors that gives the value to the system developer and policy maker working with digital environment. The model develops in this study reflect the factor which motivate or make barriers during transaction process of the customer. Research into electronic commerce is still in its infancy but it is believed that the finding contributes the further implementation of digital payment system and also contribute in the study of e-commerce. Further, more research is needed in this domain of digital payment systems. There should be multi-cultural comparison of payment cultures and preferences also needed. However, to identify the specific needs for digital payment services and to examine the cooperation strategies that enable sustainable service development for the market. Future research on this area could take a more holistic approach to develop technology and to compare between the technologies.

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Plastic Currency : Gateway to Cashless Society?

Komal Dhanda[1] and Usha Arora[2]

Abstract

The inception of cashless society is a new phase in the Indian economy. India is on the way of its transformation in to a cashless society. The government is leaving no stone unturned topush plastic currency as the primary mode of transactions. The Plastic currency refers to the usage of all types of credit cards, debit card, ATM cards and smart cards. The prevalence of plastic currency has reduced dependency on paper notes and also given freedom from the outmoded practices of transactions. Now the proneness and enforcement of cashless businessesis not confined to the metropolitan cities but it has also grasped the small cities and towns. Plastic currency is ubiquitous now so itconstitutes an important area of research for studying consumers' outlook towards this changing scenario.This study aims at understanding plastic currency users' perceptions, their preference for the plastic currency over paper currency and their concerns regarding cashless society. The presentstudy has also done extensive review on thevarious variables of plastic currency like consumer behavior, interest rates, frauds and usage pattern.

Keywords: Cashless transactions, Credit card, Debit card, Frauds, Plastic currency.

1. Introduction

Everything on the earth has evolved and transformed with the time. So money is no exception. There used to be a time when no money existed but barter system prevailed, i.e. exchange took place in the form of things. Money has changed its form, shape and size time to time. Some of the major stages through which money has evolved are as follows: 1) Commodity Money 2) Metallic Money 3) Paper Money 4) Plastic currency.

Digitalization andadoption of modern technology has made consumers more challenging and demanding which has paved the way for plastic currency. Moreover, with new technologies, everything can be done faster, so expectations rise for speed and effectiveness from the customer's standpoint also. To put it differently, the demand for plastic currency increased rapidly by the utility grasped by the consumers. Another factor for the growth of plastic currency is due to the wide publicity given to it.

Indian consumers are using plastic cards more than ever before. There are many banks that provide credit and debit cards to their customers in Haryana. Looking at the wide publicity and

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popularity, Plastic currency is gaining reception in rural India. HDFC Bank, the second largest private lender in the country, has started offering credit cards even at its rural branches.

It is pertinent that banking sector plays a substantial role in modeling the economy of a nation. Likewise, the Indian banking sector is adding to the economic growth of the country by providing inventive payment apparatus and has thus brought a significantdifference in the life styles of the people. The Payments Council has made a proclamation that cheques will become obsolete by 2018. Making payments through paper currency is becoming increasinglyunviable in the 21st century. Nowadays, only a very small number of shops readily accept cheques. Compare this diminishing figure to the number of shops that are making arrangements for accepting credit cards as a payment mode. Even local corner shops are implementing card technology.

But the Cashlessness is possible only when all the stakeholders in society like organizations, financial institutions, governments and individuals concede and entrust the plastic currency. People are more appeased by the physical and less likely to put all of their confidence in banks and other financial institutions because of the global blow off and continuing downfall in the financial services industry.

2. Variants of Plastic Cards

Credit Cards

Credit cardcan be defined as a small plastic card issued by a bank, giving right to the holder to make purchases on credit with a credit limit. It is issued by banks or financial companiesand generally carries the logo of the bank card corporation like Visa, Maestro, etc.Credit card may be used repetitively to borrow money or buy products and services on credit. Unlikedebit cards, overdraft facility is provided by credit cards and purchases can be made above the total amount that is available in the customer's saving account and thus it is considered as a credible payment tool (Gaurie, M.2007)[1]. But, the balance that remains unpaid calls for heavy finance charges after the due date. Card users must try to pay off the outstanding balance and sock awaythe charges else that would be levied on them. Bank offers many Equated Monthly installments (EMI) schemes to the users for big purchases so that they can easily pay off the due balance(Vardhaman A, 2008)[2]. Clearance and reimbursements through credit card is a convenient and trustworthy process and banks play a pivotal role in this whole procedure.

Smart Card

It is a plastic card that contains an electronic chip. It enables the card user todo buying and sellingof goods and services, access technical details, medical records, financial statements, etc.enter restricted areas or perform other tasks which require data stored on that chip. For example Smart card was introduced by DMRC (Delhi Metro Rail Corporation) for passengers commuting in the metro rail in Delhi.

Charge Card

A charge card comprises of all the characteristics of a credit card; but the card user need to pay the full amount that has been billed strictly by the due date given. If the cardholder fails in doing so, he willbe treated as a defaulter and will have to pay up late payment charge, which maybe really steep.

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Amex Card

Amex means American Express. Itis one of the oldest and most popular charge card. Amex card works independently among its own merchant establishment tie-ups and has set up its separate network.

Master Card and Visa

MasterCard and Visa are international NPO's (non-profit organizations). Their main purpose is to promote the growth of the card business usage across the globe. A massive chain of merchant establishments has been built by them so that customer's from any part of the world are able to use their plastic cards to make their desired payments.

Debit Cards

It is a kind of bankcard which is used to make a computerized withdrawal from funds deposited in a bank. Debit card subtracts money directly from a user's account to pay for a purchase. Debit cards limit the need to carry cash or physical cheques to make payments. Debit cards are taken as the appropriate and conducivesubstitute for cash and that is why it is considered as the integral part of electronic commerce. Debit card isa plastic card that bears resemblance to a credit card but functions like a cheque. The present debit cards are 'Debit-cum-ATM', that means these can be used as a debit card at a retailer store (deduct the funds in a bank account) as well as an ATM card (to validate and draw away the money from an ATM).

Just like credit cards, for Debit cards also branded networks exist - Visa Electron/Maestro. These logos can be seen (in addition to Visa and Rupay) at some of the ATMs. Unlike a credit card, a debit card does not have any float (Gaurie, M. 2007). It has outplayed the problem of delayed payment process of cheques to a great extent.

Currently debit cards transactions are processedthrough online debit mode based on PIN or through offline debit mode based on signature.

ATM Cards

ATMstands for automatic teller machines.Cash withdrawals,deposits, transferring funds in the accounts, etc. are some of the functions which are performed through ATM cards. The cards are inserted into an automated teller machine and then aPINhas to be entered for security. The account is then checked by the system for adequate availability of funds in the cardholders account before any transaction is permitted.

3. Advantages of Plastic Currency

- **More Purchasing Power:** Need not to mention increased purchasing power at the hands of consumers as easy credit is available on credit cards.
- **Handy: O**ne can purchase anything from anywhere through plastic cards without spending money on fare or cash transactions. Time consuming process has been made easier with the help of plastic money.
- **More Safety:** The potential problems of theft have decreased to a great extent as one need not to carry large amount cash. Plastic currency is acceptable everywhere and any time.

4. Disadvantages of Plastic Currency

- **Limited Vendors:** Some of the shops accept cards of a particular bank only. In that case the cash payment is the onlyoptionleft with the cardusers of another company.
- **Less International Availability:** A large number of cases are there where many companies do not permit the usage of their card in a controversial region.

- **Deteriorated Magnetic Strip:** There is a magnetic strip on the cards which gets worn out because of its heavy use. If such a thing happens at the time of travelling then consumer can be in a big trouble.
- **Piling up of Debt:** Card providing companiesgenerally impose high interest rates (15% to 20%) for the usage of extra money if consumer fails to payoff by the fixed date of the month. So it is like taking loan at very high interest rates.
- **Rising number of Frauds:** Plastic cards can be stolen. In today's world of high technical advancement it is very easy to get a Plastic card cloned, which works like original and it can bring the consumer in a heavy loss. Therefore,consumers have to be careful about these frauds. Otherwise, themoney gets stolen from your pocket without your knowledge.

5. Review of Literature

A literature review is an assessment of a body of research that addresses a research question. In addition, a literature review identifies what is already known about an area of study. Not only this but it also identifies the areas where research might be lagging and scope exists for the researcher to contribute accordingly. Further, a comprehensive review of literature is important because it provides an up-to-date understanding of the subject and finds out the methods used in previous research on the topic. Finally, review of literature enables a worldwide perspective towards the research, by comprehending the work carried out across the globe.

Literature review is conducted under following heads:

- Overview of Plastic Money.
- Plastic Money and Consumer Behaviour.
- Interest Rates and Risk in Plastic Money.
- Credit Cards and Young Consumers.
- Credit Card Frauds.

6. Overview of Plastic Money

With the changing time, money has also got transformed from metallic coins to paper money and now got converted in to e-money with the introduction of plastic cards (Ramasamy *et.al*, 2006)[3]. Plastic currency is the name given to various kinds of plastic cards that are used everyday as a substitute to paper notes (G. Sudhakar, 2014)[4]. Coupled with this, it can be stated that plastic currency is handy and has reduced the risk of carrying bulky cash in the pockets. Further, F R Sumi and Ayesha Binte (2014)[5] defined plastic money as that electronically operated mode in which details of clients and the bank are recorded and this information can be attained by inserting the card into the ATM or at POS. Similarly, Shaukat Ali, (2014)[6] has stated that due to progressive growth in technology sector and quantum jump in the disposable money in the hands of consumers is making plastic currency the money of future besides its limitations like risk involved and huge finance charges. Moreover, the role played by these

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plastic cards as e-payment device is swelling by virtue of 24x7 services catered by the banking industry. There have been many reasons for adopting plastic currency on the place of paper money like Discounts, No botheration of tackling cash, Security, Tension free EMI's, Handy, Personal loan on credit cards (Sushma Patil, 2014)[7]. It got some support from Roger K. Doost (1997)[8] who stated that there is more risk in handling cash and cheques because there are always some bad cheques and some uncollectable accounts. Likewise, Bansi Patel and Urvi Amin, (2012)[9] discussed that now a days plastic currency has become imminent part of the transactions. However, Plastic currency especially credit card was measured a luxury, but now it has become a need. Earlier, plastic cards and e-payments were used only by affluent urban residents but now it is tapping rural area as well. With the advancement in banking and trading arena, the number of users in fixed income group or salaried class has also increased manifolds (P Manivannan, 2013)[10].

7. Plastic Money and Consumer Behaviour

The importance that is being attached to plastic cards is not only because of the fact that it can be used as a tool to boost purchasing power but also as a catalyst for pathological consumer behaviour to encircle credit card as a technology that can be lifestyle facilitating. Likewise, the study of Feinberg, R. (1986)[11] also supported that as more people adopt plastic cards, a sort of mental conditioning might take place, by which card impetus may become correlated to spending. To support this study 4 experiments were conducted to test whether the situational conditioning can affect consumer behaviour and to understand the extractions and outcomes of usage of credit card as a payment mode. Theseexperiments recorded that credit card impetus can increase the magnitude, probability and time taken to make decisions involved in spending. Correspondingly, Bernthal *et.al* (2005)[12] stated that credit cards are capable of moving customers towards a particular lifestyle. The usage pattern of plastic cards depicts particular values and users' lifestyle pattern. Any person's manageable and unmanageable usage of plastic card is dependent on his "Internalization of ideologies of entitlement and frugality". Not only this but other factors that play a momentous role in marketing of plastic cards are Demographic variables and psychographic variables. The perception of Indian consumers towards usage of plastic card can be related to contentment and a sense of gratification. Although, The Indian card users do not associate "status" with the usage of credit cards (Arpita Khare *et.al*, 2011)[13], but it cannot be said so for Chinese (Worthington *et.al*, 2007)[14] and Australian customers (Phau and Woo,

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2008)[15]. However Xiongwen Lu et.al, (2007)[16] pinpointed purchase mobilizing points, which showed that the well-off Chinese consumers in urban areas already use plastics cards for making payment of high value products and such users are mostly the innovators of these products. Whereas Huang and Lee, (2011)[17] claimed that the credit cards are tapping the mass market at a rate of 204.3% in Taiwan. Savings, Per capita income, disposable income and total count of banks are the dominant factors behind this speedily growing credit card market. As a matter of fact the consumers in Malaysia came out as enormous spenders and most of them go on spending aggressively even at the time of soaring prices (Ahmed*et.al*, 2010)[18]. It found some support for the interrelation between influencingcomponents (Policies of Banks, Demographic ingredients and Consumer inclination towards money) and expenditure behaviour through plastic cards in Malaysia.It was also found that consumer behaviours such as Image awareness, Materialism and Compelledspending have a great impact on usage behaviour of plastic cardsamong Malaysian students. The female only study in Korea also gave it strength by explaining the effect of plastic cards on fashion orientation, fashion inducement and compulsive buying (Park and Burns, 2005)[19]. Additionally, a study of Lin Jiang, (2011)[20] exhibit how Attitude variables like Money attitudes, Credit attitudes and Debt attitudes affect the two major causes of plastic cards debt i.e. revolving plastic cards use and negligible installments.Revolving card use mostly gets induced by the personality and attitude variables but trivial installments use was predominately influenced by the risk-returnequilibriumelement of the risk attitude. On the contrary, Brito and Hartley (1995)[21] argued that cardusers prefer to pay the interest amount on the due balance on credit cards rather than paying the negotiation cost related to the scheduling of loans from the banking institutions in spite heavy interest charges. A person's expectations and personal characteristics have an impact on the attitude towards the payment method. In addition to this, Thorson and Horstman (2014)[22] shed light on the ways that generally the family conversation and interaction between parents and young consumers results in discussion of credit card usage behaviour.

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8. Interest Rates and Risk in Plastic Money

Chahal *et al*., (2014)[23] investigated the effect of perceived risk on usage and service experience link. Time risk is the strongest moderator. Sense of security and confidence benefits influence the card usage and service experience respectively. Although this may be true but Hasan*et al.*, (2011)[24] remarked that the consumers tend to acquire a self-risk due to slackness in nonpayment of outstanding credit card bills in due time, which causes a charge of interest on the due payment and that often turns this easy plastic money into risky money. Furthermore, Jose and Wilson (2014)[25] assessed how the short run and long run risk of the users get emulated by the prices of credit cards. There is aninverse interrelationship between annual percentage rates and long run risk. Coupled with this, Foschtet.al (2010)[26] stated that consumers who acknowledged to poor supplications (e.g. credit card offers with a high APR) exhibit defective credittraits and are more prone to insolvency as compared to those who responded to premium offers.

9. Credit Cards and Young Consumers

Students' attitudes toward credit cards appear to come under the "good, if used correctly" class. It seems that the young students have a rational outlook towards the plastic cards usage but still not acquainted with the technicalities of their credit cards. Of course, the majority of students are ignorant regarding the interest charges to be paid by them on their credit cards (Warwick & Mansfield, 2000)[27]. Jill Austin & Phillips M. (2001)[28] claimed that regular users of credit card among the young students pay off the outstanding balance timely and it is because they have been using the cards before entering to college. However, Braun Santos D *et al*. (2016)[29] advised that financial self-tenacity and social comparison have predominance on how credit cards are used and exert an influence on financial health of college going female consumers. In same way, Blankson *et al.* (2012)[30] evaluatedwhat motivates college students for consuming credit cards and credit cards are useful to them. Four major parameters namely : "customer service", "incentives", "need for credit" and "purchasing power", were considered to find decision making criteria of college students. Further, Phau and Woo (2008) suggested that the adults consider money as a tool of impressive and respectable image in search of self-realization. It indicated

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that the relationship between adult's outlook towards money and the compulsive purchases can be strengthened by the increasing usance of credit cards. Although Rutherford and DeVaney, (2009)[31] contradicted it by stating that that squandering is generally an outcome of influence of companion or compeer. On the contrary, Hayhoe *et al.* (2000)[32] warned that the rigorous marketing strategies adopted by the financial companies in colleges are increasing the risk of isolating students in the long run. At the same time, realizing the depth of the problem, as all the corrective measures taken till date to avoid insolvency among the college students have been a big failure.

10.Credit Card Frauds

Frauds through credit card are swelling in numbers as it is an easy way of stealing millions from the accounts of customers, financial companies and business merchants. The techniques like Phishing, Skimming and counterfeit cards are used by fraudsters. Sharma, A. (2012)[33] has also thrown light on the rising frauds and the business merchants are the most suffered parties as they have to bear the full loss arising due to frauds, the banks also bear some part of the cost indirectly. A report of the Association of Certified Fraud Examiners (ACFE, 2007)[34] showed that the mark of frauds has touched $3 billion in the US alone. By the same token, Barkeret al. (2008)[35] gave four recommendations for controlling these growing frauds like implementingsecurity chip based cards, accessibility to skimming and counterfeit toolsshould be made more complex, provide incentives and training to business merchants should be given special training and incentivesfor noticing counterfeit credit cards; and giving an effective remedial measure tosufferers toreturn their credit amount. In the same way, Kathirvel (2013)[36] added some measures like Address Verification Service (AVS), Credit Verification Values (CVV), 3D-Secure, Biometrics, Chip and Pin for preventing credit card frauds in India. To put it in another way, inthose countries where debit cards play dual role as a leading payment card for purchases and international payment card -then fraud on debit is as problematic as fraud on credit/charge cards. It has been observed that the frauds on payment cards, specifically on MasterCard and Visa debit cards, is generally concealed amongst the data for overall frauds on payment card. So,with the augmented usage of these cards i.e. online transactions and international e-payments further contributed to the refinement of the fraudsters (Worthington, S. 2009)[37]. In Addition, Yogi Prabowo (2012)[38] established that practices for prevention of frauds in credit card industry in Indonesia are presently at a lower - level of sturdiness as compared to America, UK and Australia.

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Inadequacy in fraud prevention practices have been specified like unreliable data collection on frauds, poor management and circulation system and the ineffective and incompetent identity check mechanism. Not only this but also Due to increasing menace of frauds, especially triggered by fraudsters operating from outside the country particularly from the developed nations already having strong defense against frauds. Rigorous steps have been taken in six major extents: considering the actual problems, protection based upon technology, fraud precautionary practices, identity check & management, fraud alertness and legal restriction (Yogi Prabowo, H. 2012).

11. Research Methodology

Sample Unit

Plastic Cardusers from urban areas.

Sample Size

Total sample size 100.

Sample Technique

The sampling method used is non-probability convenience sampling. The information has been gathered from respondentswith the help of a semi-structured questionnaire and discussion method.

12. DATA SOURCES

Primary Sources

The data includes both the qualitative and quantitative data. Data is generated through questionnaire as a search instrument. Personal observation and discussion with the respondentshave also been done to extract the maximum information.

13.Data Presentation and Interpretation

Table 1: Plastic currency is the most convenient way of transactions in day to day life

Valid	Frequency	Percentage	Valid percentage	Cumulative percentage
Disagree	1	1	1	1
Agree	79	79	79	80
Strongly agree	20	20	20	100
Total	100	100	100	

Almost 79% of respondents feel that plastic currency provide the convenience for various payment transactions in day to day life.

Table 2: Everybody carries and uses a plastic card

Valid	Frequency	Percentage	Valid percentage	Cumulative percentage
Disagree	16	16	16	16
Agree	81	81	81	97
Strongly agree	3	3	3	100
Total	100	100	100	

Plastic currency has become need of the hour. Almost everybody uses either a debit card or credit card. The use and popularity of plastic currency is on rise.

Table 3: Plastic Currency a Preferred Mode of Payment While Travelling

Valid	Frequency	Percentage	Valid percentage	Cumulative percentage
Disagree	7	7	7	7
Agree	84	84	84	91
Strongly agree	9	9	9	100
Total	100	100	100	

The results exhibit that the plastic currency is preferred over paper currency while travelling as it offers flexibility to the user.

Table 4: Plastic Currency is the Safest Mode of Transactions

Valid	Frequency	Percentage	Valid percentage	Cumulative percentage
Disagree	28	28	28	28
Agree	72	72	72	100
Total	100	100	100	

There are concerns related to the safety of plastic currency in the minds of the users but still majority of respondents consider it as a safe mode of payment.

Table 5: Security and Privacy Risk Associated with the Plastic Currency

Valid	Frequency	Percentage	Valid percentage	Cumulative percentage
Disagree	10	10	10	10
Agree	83	83	83	93
Strongly agree	7	7	7	100
Total	100	100	100	

The above table depicts that majority of respondents are skeptical towards the use of plastic currency. Issues related to security and privacy play a very important role in the adoption of plastic currency. Risk associated with plastic card raises doubts in the minds of the users.

Table 6: Plastic currency is more economical and useful than paper currency

Valid	Frequency	Percentage	Valid percentage	Cumulative percentage
Disagree	4	4	4	4
Agree	89	89	89	93
Strongly agree	7	7	7	100
Total	100	100	100	

Consumers find plastic currency very beneficial and useful because of its 24x7 accessibility and utility. It is also considered economical as one does not have to carry bulk cash and need not to block the money in the pockets. Plastic cards can be used as and when required.

Table 7: Plastic currency will be able to replace paper currency in India

Valid	Frequency	Percentage	Valid percentage	Cumulative percentage
Disagree	4	4	4	4
Agree	92	92	92	96
Strongly agree	4	4		100
Total	100	100	100	

A large majority of respondents see a superior position of plastic currency in India. Seeing the current scenario in the economy, plastic currency stands at a dominant position undoubtedly.

Table 8: Central Bank and Government is taking some mandatory actions for the implementation of plastic currency.

Valid	Frequency	Percentage	Valid percentage	Cumulative percentage
Disagree	14	14	14	14
Agree	86	86	86	96
Total	100	100	100	

Consumers strongly feel that Government and centralbank's policy will be mandating plastic currency in near future as they are focusing on Digital India.

14. Conclusion and Suggestions

It is pertinent that the use of plastic currency in India is booming specially after demonetization drive. It has been found that since November 2016, e-payments taking place in India haveincreased manifolds. This bold move from the government has changed the face of the Indian economy. Digital India scheme of the government is focusing on the cashless transactions and taking all the necessary steps to stream down the hard cash dealings. Therefore, the future prospects of plastic currency in India are bright enough to bring massive growth in its popularity among customers as well as bankers. All types of banks whether public, private or foreign are evidently adding up towards the development of plastic cards in India. Apart from regular shopping, the cards are used for the payment of various bills and thus no wonder that in spite of inherent limitations, risk, and heavy charges, plastic currency is currency of future and could be in much more dominant position. So it will not be inappropriate to state that usage and pertinence of paper money would be marginalized.

The results depicted that the consumers have a favorable outlook towards plastic currency because of the convenience and freedom it provides to its users. Young generation consumers are found more inclined and enthusiastic to move towards cashless society. However, it was also realized that users have a concern for the risk associated with the use of plastic currency. Every time a cashless transaction is made, it leaves a doubt in the mind of the user regarding its security.

Hence, the ubiquity of the plastic currency demands some stringent actions from the government to have a check on the security issues. Therefore, the government must come up with some measures to bring suitable amendments in Cyber Laws. Above all, there is a need for self-responsibility at the hand of public in general.

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Relationship Between Self- Efficacy Optimism, Personal Optimism and Career Planning in Manufacturing Sector

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Abstract

In times of career transitivity, knowledge about the factors that supports a successful career planning is vital, owing to the fact that an individual needs to have a positive futuristic approach. This article concerns the relationship between self- efficacy optimism, personal optimism and career planning. The study included 283 managers from public and private manufacturing sector. Correlation and regression analyses were used to examine the relationship between optimism and career planning. The results indicated that there exist a strong relationship between optimism (measured by self- efficacy optimism, personal optimism) and career planning. The findings and results were discussed and future research recommendations were also addressed.

Keywords: Career planning,Indian Sectorpersonal optimism, Positive Psychology, self-efficacy optimism.

Introduction

Dynamic business environment have brought many changes in the socio- economic environment and poses a greater challenge which needs to be dealt with in a positive manner. In all, a new science of strength and resilience is unfolding, one that will endeavour to make normal people stronger and happier, more productive, masterful and efficacious. Positive psychology and the emotions it entails impact strongly upon physical health, as numerous researchers are beginning to show (Salovey et al., 2000). The notion of optimism becomes pertinent when one considers Eysenck s (1976) statement that the personality trait is comprised of several subtraits, including sociability, impulsivity, and optimism. Various authors supported that an optimistic explanatory style (Abramson et al., 1978; Seligman et al., 1979; Peterson & Seligman, 1984; Seligman et al., 1984) is associated with a wide array of constructive performance deliverables in fields like athletics, academia and other functional domains (Peterson & Seligman, 1988; Peterson & Barrett, 1987; Nolen et al., 1986). According to Kruger and Killham (2005) of Gallup Management, managers significantly impact the employee engagement and well- being at workplace, which at the hind side plays a major role in the performance of an organization (Arakawa & Greenberg, 2007). Further, Fredrickson's (1998) broaden-and-build theory of positive emotions provides a description of how managers might create more engaged employees. An optimistic explanatory style has been linked to a wide range of positive performance outcomes in academic, athletic, and work domains (Seligman et al., 1984).

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Various studies have tried to measure the association of optimism with the performance-related variables. Still, there is a paucity of research in exploring the linkage of dimensions of optimism with the career planning especially under the scenario when there is shift in the concept of careers from traditional to boundary less. Careers are currently seen from the point of view of a progression of ventures in numerous associations (Arthur & Rousseau, 1996).

In the current research, we try to examine the relationship of optimism with career planning. Another particular feature of this study is the adoption of operationalization of career based on Luthans (1981) it is a set of separate but related work events that delivers continuity, order and a meaning in an individual's life. This research encompasses integration of concepts of career planning with positive psychology to explore the effectsof optimism on career planning dimensions in the Indian scenario.

Cultural Context

The present research chose the Indian context to measure the relationship between dimensions of Optimism and Career Planning owing to its cultural diversity which has a huge impact on the management practices being followed (Arora & Rangnekar, 2015). India, being a strong believer in collectivism, display a lot of affection and dependence on one another and all the decisions are taken keeping in mind the prevailing societal norms (Hui & Triandis, 1985). As gathered from the epic of Ramayana, Indians have a positive outlook in general, which is reflected in the work they perform. Also, the survey done by India Today in 2005 revealed that Indians are more focussed and dedicate towards their career keeping in mind that the present generation is a balance- seeker. Considering these particular aspects of culture in Indian sub-continent, the present study seeks to study the role of dimensions of optimism in Career planning among the managers working in the Indian Manufacturing organizations.

Literature Review

Optimism

Optimism can be defined as a general expectation that individuals might experience good outlooks in life (Gillham, 2000). Various studies have shown that Optimism strongly predicts behavior which leads to attainment of the goals. Even when there is anticipation of unfavourable outcomes, Optimism makes an individual to expect for favorable outcome. Further, researchers (Chemers et al., 2000; Gillham, 2000) established that people who are optimistic are likely to have coping behavior in stressful situations. Also, it enhances the adaptability of an individual to face a change in more assorted manner.

Additionally, optimism plays an important role in academics related, work-related, and psychological adjustments. Lent and Heckett (1987) revealed that optimism is associated with higher levels of career exploration, planning, career goals and life goals. As per Carver & Scheier (2002), optimists might be more likely to make efforts to ensure their well-being and engage in productive patterns. Optimism has attracted a large measure of interest from psychological researchers, yet as a construct is still markedly subject to theoretical and applied debate. As we have seen thus far, some researchers (Lockhart et al., 2002) argue that optimismfacilitateslearningandpromotesperseverancean individual,whileothers (Schneider, 1998) argue that it rather endows a degree of naivety that prevents the child from understanding the constraints of reality, and may consequently lead the individual into physical danger. Such arguments as to the adaptive utility of optimism, however, may be premature, since more fundamental issues as to the definition of optimism, and the most accurate and appropriate mode of measurement of this construct, stillremainoutstanding.

The positive influence of dispositional optimism has been largely understood under the auspices of Carver and Scheier's (1989) cybernetic model of regulating self. As per this model, goal-directed behaviours are stronglyinfluenced by people's expectations about what the results of their behaviours might be (Armor & Taylor, 1998; Bandura, 1977, 1986; Seligman, 1975; Rotter, 1954). If prospects for success are favourable, behaviour will be initiated and maintained; if prospects are unfavourable for success, then behaviours will not be initiated, or the person would disengage from existing pursuits (Armor & Taylor, 1998). Actual outcomes from studies support this model favourable expectancies are seen to increase effort, motivation and persistence, even in the face of obstacles that might usually impair performance (Armor & Taylor, 1998). Such observations clearly align with lay or commonsensical understandings of what it means to be "optimistic". Conversely, studies demonstrated that less favourable expectancies for success have been associated with premature, detachment from tasks, and more internal attributions for failure (Armor & Taylor, 1998; Gillham, 1995). The link between expectancy-based cognitions and affect is abundantly clear – where the expectation for success does not exist, then disengagement, anxiety, and helplessness results, the key forerunners of a depressive episode.

Optimism (Carver et al., 2010) may be related to development and performance of an individual owing to his persistence. It deals with the avenues of how an individual, group or organisation flourishes. Objectives are activities, qualities or end-states that individuals perceive as being either alluring or undesirable. Many studies support that Optimistic employees tend to achieve objectives qualities or end-states that individuals perceive as being either alluring or undesirable more effectively and efficiently (Scheier & Carver, 1985). Researchers have characterized the populace as generally optimistic by their estimations i.e. Nes and Segerstrom (2006) asserted that almost of 80% of individuals are named hopeful. In 1985, Scheier & Carver identified Optimism as the cognitive or rational disposition to expect favorable output. Similarly, Srivastava& Angelo (2009) defined Optimism as a propensity to anticipate favorable outcomes or results. Researchers argued that there are various differences at individual level in optimism i.e. some individuals are more motivated than others to assume that good things would occur across different realms of life. Also, Gavrilov-Jerkovic (2013) defined optimism as the general expectation of positive outcome without emphasizing on the agent who controls the outcome.

In addition, Wrosch et al. (2003) and Carver et al. (2010) recognized positive thinking as a variable that can be both particular and general: both an evaluation of life when all is said and done and an appraisal of a specific territory or occasion in one's life. Within this framework, optimism has been defined in a more inclusive way and operationalized to incorporate two parts: Personal optimism & Self efficacy. Personal Optimism is the tendency or penchant to take a look at the brilliant side of any circumstance (Gavrilov- Jerkovic, 2013) and expect the most ideal result from any arrangement of occasions (Srivastava & Angelo, 2009). Also, Personal optimism (Carver & Scheier, 2014), which has been studied with positive effects on motivation, career satisfaction and well-being (Williamson et al., 2005; Lee et al., 2013; Rasmussen et al., 2009; Nes & Segerstrom, 2006; Lounsbury et al., 2003), and comparatively a new construct, self-efficacy optimism (Rottinghaus& Miller, 2013; Rottinghaus et al., 2005), which is conceived of as a characteristic adaptation and defined as an element of a bigger set of optimistic anticipations, encompassing expectations of personal competence as a unique characteristic (Gavrilov- Jerkovic, 2013). Further, Carver and Scheier (2010) have emphasized that optimistic people expect positive outcomes and events throughout the course of life.

The impression of optimism (Granberg& Brent, 1983; Weinstein &Lachendro, 1982; Weinstein, 1980) is expressed in terms that positive upcoming life transitions are more likely and negative future transitions of life are more outlandish for themselves than for other individuals like them.

Further, Drake in 1984 contended that state of mind and the individual's optimism impacts the cortical regions and in-turn the performance of an individual.

While Bandura and Wessels (1994) accepted that conduct is fundamentally more controlled by perceived self-efficacy than by result outcomes, and that outcomes are altogether impacted by possibility convictions, whereas expectancy-value philosophers (Wigfield & Eccles, 2000) express uncertainty in this relationship. In addition, Karademas (2006) supported that self-efficacy envisages satisfaction of life and despair through optimism.

Through various studies it has been established by researchers that the linkages between optimistic explanatory style in correlation with efficacious job performance (Seligman & Schulman, 1986). Kouzes and Posner (1999) that if employees are optimistic, they perform at a higher level and are highly engaged with the organisation.

Career Planning

Career can be defined as a set of separate but interrelated work activities that provide direction, meaning and continuity to an individual's life (Hall, 2002). It does not merely constitute a sequence of job-related experiences, but comprises of accurately sequenced role experiences, leading to a rise in levels of responsibility, compensation, social along with professional status, power and authority. It represents a sorted path being followed by an individual across time and age in his/her professional life. In the words of Hall (2004), Career comprises of a series of jobs and positions held and work accomplished over a period of time, rather than just referring to one job or a position.

Due to altercations in the nature of careers over a period of time, people feel accountable for career management (Hall, 2002). This change has amplified the need to plan and engage in the career behaviors proactively (Thomas et al., 2010). Various measures for distinct career behaviors such as career planning (Gould, 1979), career planning programs (Walker, 1978) and networking/ social support (Wolff et al., 2011) exist. Previous studies (Bolles, 2009; Hall, 2004; Hall, 1976) have pointed to the need for individual career planning for a successful career. Several private and public organizations are looking into different aspects of formal career planning programs (Walker, 1978). The aim of these programs is to enhance the extent of personal career planning, which could lead to more prompt and effective careers and career choices.

"Career planning is the deliberate process through which someone becomes aware of his or her interests, personal skills, motivations, knowledge and other characteristics; acquires information about choices and opportunities available; identifies specific career-related goals; and establishes an action plan to attain the goals" (Dessler, 2008). Also, Career planning gives confidence to take greater responsibility for one's self development. This development also entrenches the shaping of skills measured as significant in the present scenario (Doyle, 1997). Results of the empirical research, which was conducted at the student and employee levels, demonstrated that career planning is of higher importance in order to win a job and for long term achievement of career - goals (Folsom & Reardon, 2003; Broscio&Paulick, 2003). Career planning attitudes are defined as predispositions which try to assess the degree of engagement in career planning (NOICC, 1992). Therefore, there is a need to develop attitudes, interests and skills of career planning which are required for effective and efficient career choices.

The Optimism and Career Planning

Optimism is considered to be a self-regulating mechanism in determining whether an individual will start or continue working towards the desired goals, which is in-sync with the control theory (Carver & Scheier, 1981, 1982). According to the theory, if individuals' expectations of eventual

success are adequately constructive then they have the tendency to remain engaged in efforts to reach anticipated aims and objectives despite of all the roadblocks.

According to a study, Career issues are especially notable for youthful populaces where youngsters should be educated, gifted, and sure to set future objectives and settle on profession related choices. Imperative to this life change from education to work are youngsters' levels of career development, their profession related basic leadership capacities, and the precision of their future work- related objectives. Further, Geers (2000) established the relationship between optimism and academics, health, other outcomes.

Sullivan and Mahalik (2000) assessed the impact of Self Efficacy on the career planning - vocational exploration among 60 women in New England. The authors undertook an experimental study design, in which thirty women received a 6 week career related course that focused on increasing their Career Self Efficacy. In addition, Lent & Hackett (1987) investigated the relation among self-esteem, Optimism, career anticipations, career objectives and career exploration, considering that gender would also impact the career planning, which depicted that male and female both plan for their career. Further, Creed et al. (2006) evaluated the relation between Self Efficacy and Career Decision- making. Also, Bertoch (2010) added to the literature of relationships among goals, career planning, career decision- making and performance in the course of career development.

In 2010, Gunkel et al. assessed the relationship among career planning, personality considered moderator and Career Decision- making. The research established that culture has a significant effect on career planning. As per a study conducted by Murphy et al. (2010) career transitions and other general themes, comprising of the role of anticipations, optimism and resilience in the college-to-career transition. The results from this study also suggested that realistic and well-informed expectations might play a central role in emerging adults' perceptions of both their current Life Satisfaction and experience of their transitions to the working world. In 2011, Duffy established that Optimism or higher the positive outlook in life the more an individual plans the course of his career. Also, the students had positive outlook on their future career related to higher Career Adaptability and Career Optimism. Atta et al. (2013) examined the impact of Self Efficacy on career planning attitude measured by negative career thoughts. The authors estimated that Career Self Efficacy would be negatively related to negative career thoughts. Based on the research reviewed thus far, the dimensionality of the POSO-E (Personal optimism and self-efficacy optimism scale- Extended) remains unclear, also the scale has not been tested on Indian samples, nor has the construct of optimism been studied in relationship with career planning, where a futuristic orientation is the primary concern.

Also, the current study empirically examines the relationship of optimism in terms of subscales i.e. personal optimism and self-efficacy optimism along with career planning. Therefore, within this framework following hypothesis has been formulated:

H1: Personal optimism is positively related to Career Planning

H2: Self-efficacy optimism is positively related Career Planning.

H3: Optimism is positively related to Career Planning.

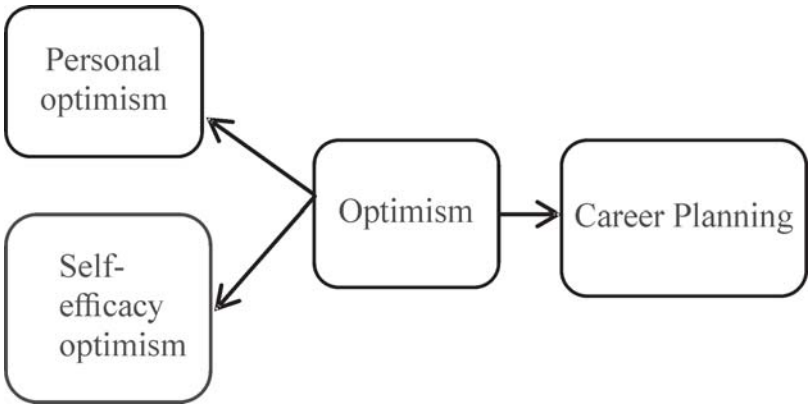


Figure 1: Hypothesised Model

Methods

Participants and Procedures

The sample of the study included middle-level employees working in the Indian organizations. The study adopted a cross-sectional survey-based research design for the purpose of collection of data. Specifically, respondent employees were surveyed via convenience sampling method (Suen&Ary, 2014). The data were collected by conducting personal visits and through training programs from the Public sector organisations. Of the survey questionnaires that were distributed, nearly 301 survey questionnaires were returned from the respondents. After preliminary screening and subsequent processing of the missing data, 25 survey forms were discarded, thereby resulting in overall 283 usable responses.

Respondents consisted of 87.6 percent males and 12.4 percent female middle- level employees from public and private manufacturing sector organizations in North India. The respondents were in four age groups: 21-30 years, 31-40 years, 41-50 years for the current study. The employee's demographic characteristics are shown in Table 1 which includes their tenure in total as well as with the present organization along with their education profile, and they are mainly junior level, middle and higher level employees working in the public and private manufacturing sector of India.

Measures

Optimism

Optimism was assessed by using a 9 item scale where the subscales of personal optimism contains 4 items and self-efficacy optimism consists of 5 items adapted from POSO (Jerkovic' et al., 2013). The responses on the scale items were tapped using the seven-point Likert Scale that ranged from 7 (strongly agree) to 1 (strongly disagree).

Career Planning

The Career Planning was assessed by using a 3 item scale adopted from scale developed by Hirschi et al. (2014). To confirm for the contextual usefulness of the Career Planning scale in the Indian context, we conducted a pilot study on managers from multiple organizations (n=35). The pilot testing was found to be reliable for the variables (Cronbach's á>.7) (Nunnally, 1978). Participants responded to items on a seven-point Likert scale ranging from 1 (Usually) to 7 (Never).

Results

Collected data were tabulated and essential inferential statistical measures were applied. In order to perform quantitative analysis SPSS statistical software (Version 23.0) was used. Also, an Exploratory Factor analysis has been applied to check the validity of the items (Table 2). The factor loadings depicted that the items stands valid in the Indian context, which means the Unidimensionality of the scale have been tested for the current study.

To examine the association between the independent and the dependent variable, coefficient of correlation and regression were calculated and the outcomes were as follows. It can be seen that both the categories of optimism i.e. Personal Optimism and Self-efficacy optimism had positive correlations with Career Planning. Also, Cronbach s á of the all the study variables were found to be more than 0.70 (Nunnally, 1978).

Table 1: Demographic Characteristics

Variables	Number	%	Variables	Number	%
Age, Yrs			**Tenure, yrs**		
<30	179	63.25	< 15	173	61.13
30-40	62	21.90	15-25	48	16.96
>40	25	8.83	> 25	33	11.66
Non- Respondents	17	6.00	Non- Respondents	29	10.24
Gender			**Education**		
Male	201	71.02	Under-Graduate		
Female	69	24.38	Post-Graduate		
Non-Respondents	13	4.59	Non-Respondents		
Experience (Present Organization)			**Ownership**		
< 15	194	68.55	Public sector	149	52.65
15-25	41	14.48	Private sector	134	47.34
> 25	29	10.24			
Non- Respondents	19	6.71			

Table 2: Demographic Characteristics

Item No.	Item	Factor Loading
1	Facing future in optimistic way	.71
2	Something positive in future	.82
3	Don't worry about Future	.81
4	Seems everything is bright	.83
5	For each problem I will find solution	.79
6	I will find a way	.93
7	I master difficulties	.71
8	I can master difficulty	.68
9	I always find a solution	.71
10	Design my future	.84
11	took things to achieve career goals	.96
12	planned goals or my future career	.74

Hypothesis 1: The study resulted in a standardised coefficient â equivalent to .719 and the value is highly substantial (P<0.05). The highly significant and big positive value signifies that Career Planning and Personal optimism are highly related (see Table 3). Thus, the first hypothesis stands valid and is accepted. Especially, the result suggested that 51.6 % of the employees accepted that individuals with high personal optimism tend to form plans for future on a personal as well as career level (Wille et al., 2013). The reason for this may be that in manufacturing sector the individuals need to be optimistic about the situations which need to be inculcated through positive outlook to achieve organisational goals. Further, Optimism is able to predict the mental health along with the physical (Robinson-Whelen et al., 1997). Also, Optimism is associated with career decision making, career planning and other career related variables (creed et al., 2002).

Table 3: Model summary Personal Optimism and Career Planning

Model	R (Standardised β coeff.)	R^2	Adj. R^2.	Std. Error of the Estimate
1	.719[a]	.516	.518	3.46105

Source: Authors'own.

Hypothesis 2: The study resulted in a standardised coefficient â equivalent to .701, and the value is largely positive that implies self- efficacy optimism is positively related to career planning (Table 4). Thus, the second hypothesis stands accepted. This signifies that optimistic people desire to be involved, say finding out job possibilities may be by collecting information from others or by themselves, taking part in activities which could broaden the horizon and help in understanding what kind of work an individual wants to do. The positive links between self-efficacy and performance have been reported extensively (Wolters & Pintrich, 1998; Manstead & Van-Eekelen, 1998; Stajkovic & Luthans, 1998; Newby-Fraser & Schlebusch, 1997; Vrugt et al., 1997; Pajares, 1996; Sadri & Robertson, 1993).Thus, Planning for a career and exploring the potential areas is required to implement one's goals to develop one's career or progress vocational development.

Table 4: Model summary of Self- efficacy Optimism and Career Planning

Model	R (Standardised β coeff.)	R^2	Adj. R^2.	Std. Error of the Estimate
1	.701[a]	.491	.490	2.49112

Source: Authors'own.

Hypothesis 3: The Table 5 depicts that if all the dimensions of optimism are applied togetherthen $R^2$is equivalent to .581, and the value relatively significant (p<.05). This positive value implies that optimism and Career planning are relatedto a significant level but the degree of relationship is not very strong owing to the other factors (networking, career satisfaction, interpersonal relationship, resilience, hope, life satisfaction, positive affect and negative affect) which affect the relationship (Manstead& Van-Eekelen, 1998). Thus, the third hypothesis is accepted. Specifically, the result (R2 = .581; p<.05) suggests that 33.7 %. In other words, the results shows that if the two dimensions of Optimism are applied together, career planning i.e. tendency to plan ahead to achieve a goal in life is amplified by 33.7 %. Employees advocated that individuals having belief in themselves tend to perform better and that too for a long period of time indicating that there is a need to attain the goals they have set for themselves (see Table5). Under such circumstances, they will work with more passion and enthusiasm, resulting in a better productivity.

Table 5: Combined results of the inter-correlation among all dimensions of Optimism and Career Planning

Model	R^2	Adj. R^2.	Std. Error of the Estimate
1	.581	.337	1.65262

Source: Authors'own.

These findings also indicate that optimism may have a key role to play in an individual's career orientation (Creed et al., 2002). If positive anticipations of the forthcoming times for an individual can be nurtured then they are likely to exhibit higher levels of career planning and exploration, more confident about their choices of career, and have new career - goals. Thus, when developing interventions or programs that focuses on career orientation in individuals or employees of an organization, an important component will be to include methods to increase the participants' levels of optimism (Aspinwall & Taylor, 1992; Scheier & Carver, 1992).

Conclusion and Future Scope

Owing to a lot of competition due to globalization, the business environment puts a lot of pressure on how well the organizations structure and what practices they follow to motivate and retain their employees. The findings revealed that a higher level of optimism is positively and largely demonstrate a higher level of career planning (Creed et al., 2002). Further, the implication inherent in this finding is the importance of investigating optimism and pessimism independently when conducting further research in this area. Obtaining a single score for optimism is no longer appropriate, and it is recommended that two scores be obtained, one for optimism and one for pessimism (Seligman et al., 1984).

As per the present findings, a number of areas need to be further examined. Study needs to inspect the developmental course of optimism and pessimism in general and specifically in relation to the development of career maturity variables for young people. Related to this, the importance of positive outlook in defining an individual's career-related activities and career course needs to be studied. For example, how does optimism impact the job performance, and the role of mediating and moderating variables? It is likely that optimism research will substantiate a productive opportunity to facilitate a better understanding of the career development.

The study results have huge implications for manufacturing organizations in Indian context. For example, organizations should motivate employees to build a positive outlook (Hu et al., 2014). Further, personal optimism and self-efficacy optimism should be cultivated in the employees by providing training and development to promote the competence and skill-building events which would help in better productivity and the employees would be in a better position to understand the scenario at workplace. Also, the employees should understand the importance of positive thinking and to what level it affects the course of career, which should be demonstrated by the employer as well. Finally, the study might help in preparing the guidelines for positive thinking which can be executed in the manufacturing organisations.

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Developing a Framework for Green Flexible Manufacturing System

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Abstract

The economic growth of a country significantly depends on performance of manufacturing sector. The designs of products are changes very frequently. Product life cycle is reducing very fast. Hence it is challenge for the manufacturers to fulfil the market requirements without affecting environment. This paper develops the framework for green flexible manufacturing system (GFMS) consisting of application of advanced manufacturing technologies (AMTs), green process design and green product design for controlling and maintaining reverse impact on environment. Study has used Analytic hierarchy process (AHP) approach. On the basis of study, green product design has highest ranking for green flexible manufacturing system followed by green process design and application of AMT. This paper helps to encompass various aspects of technology which help us to reduce the human impact on environment and create ways for sustainable development.

Keywords: Green flexible manufacturing systems, Environmental pollution, Ecofriendly technology, Analytic hierarchy process.

Introduction

The fast changing and dynamic global business environment requires firms to be more flexible to quickly adapt and respond to market changes. Among the forces that drive changes, requirements for corporate responsibility and sustainability are getting more urgent. During such difficult time as this economic downturn, companies are faced with hard choices to survive. Research has acknowledged that addressing sustainability issues is critical to the long-term existence and thriving of companies (Porter and Kramer, 2006). According to Singh et al. (2005), in such a dynamic environment, organizations that are able to continually build new strategic assets faster, cheaper and more flexible than those of their competitors will create long term competitive advantage. In this process core competencies have a pivotal role to play.

Manufacturing flexibility has been heralded as a major competitive weapon for manufacturing organisations operating in increasingly uncertain environments and turbulent markets. It has been argued that green manufacturing flexibility has the capability to provide organisations with the ability to change levels of production rapidly, to develop new products more quickly and more frequently, and to respond more rapidly to competitive threats. Green Manufacturing flexibility literature reveals that many of the new competitive frontiers advocated by authors appear to depend on manufacturing flexibility. For instance, it is argued (Bolwijn and Kumpe, 1990) that

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while, it is quite possible to be flexible without being innovative, the reverse is not true: "you cannot be innovative without being flexible". According to Roth (1996) strategic agility is achievable only with competitive strength in a combined set of generic capabilities, of which flexibility is important element.

Business competitiveness at a global scale is customary for manufacturing firms (Roh et al., 2014; Tang and Tomlin, 2008). Furthermore, environmental challenges such as climate change, air and water pollution, and resource depletion have also caused concern for organizations and countries (Bai et al., 2015b). To compete globally, manufacturing firms need to improve their manufacturing economic and business performance in terms of cost, quality, and flexibility while providing improved environmental performance (Deif, 2011; Liu, 2008).

A manufacturing paradigm embraces a group of integrated strategies, principles and techniques that work together to achieve one of more objectives. The term green manufacturing was coined to reflect the new manufacturing paradigm that employs various green strategies (objectives and principles) and techniques (technology and innovations) to become more eco-efficient. This includes creating products/systems that consumes less material and energy, substituting input materials (e.g. non-toxic for toxic, renewable for non-renewable), reducing unwanted outputs and converting outputs to inputs (recycling). Thus as much as the word "green" is used to reflect environmental friendly awareness. It is used to describe manufacturing approach that is aware of its production/product impact on the environment and resources. It also includes overall efficiency along with planning and control. Green practice is a very broad term and covers a number of activities of green supply chain, such as green purchasing, green packaging of the product, green product, recycling of wastes and end products, remanufacturing, collection of discarded product, reuse and disposal, green design, less emission, and low use of energy (Kumar et al., 2016).

Green flexibility systems that can provide flexibility with respect to environmental operations have not been studied in the green manufacturing literature (Bai et al., 2016). Increased green flexibility enables a manufacturing firm to adjust more easily to change in the green consumer and stakeholder market place and in environmental regulations requirements, while maintaining high quality standards for its products and maintaining high performance of manufacturing systems (Liu, 2008; Priore et al., 2006).

The author proposes an establishment of a relationship between sustainability as a concept and green flexible manufacturing. The aim of this relationship refers to reduce energy, less emissions, recycling of waste and to increase the productivity. In light of these gaps, the purpose of this paper is to build an evaluation and performance framework of green flexible manufacturing systems to help manufacturing firms improve green flexibility to mitigate risks and build competitiveness. In this study AHP method is applied for finding the priority weight for green flexibility factors.

The next section reviews the literature for the framework for green flexible manufacturing systems. It is followed by the discussion of AHP methodology and finally the results and conclusions.

Literature Review

Literature review is the ladder of study along with research work. This section contains developing of a framework for green flexible manufacturing system.

With new customer demands and higher awareness (Willson, 2011 and Ackerman, 1997) together with tougher global competitiveness pressure, manufacturing enterprises need to review their manufacturing strategies. Green manufacturing should be viewed as an opportunity to expand

the local and global market share in this dynamic environment. A deeper understanding of green manufacturing strategies and techniques will enable manufacturers to realize that unlike other competing manufacturing strategies(like cost and time), being green positively impact all other manufacturing competitive edges (as shown in Fig. 1). For example reducing material wastes and energy consumption will reduce production cost and improve production time. Adopting green flexible manufacturing will also improve the quality of the production process which will in turn impact product quality and also will be more appealing to the growing number of customers looking for green manufacturers and products.

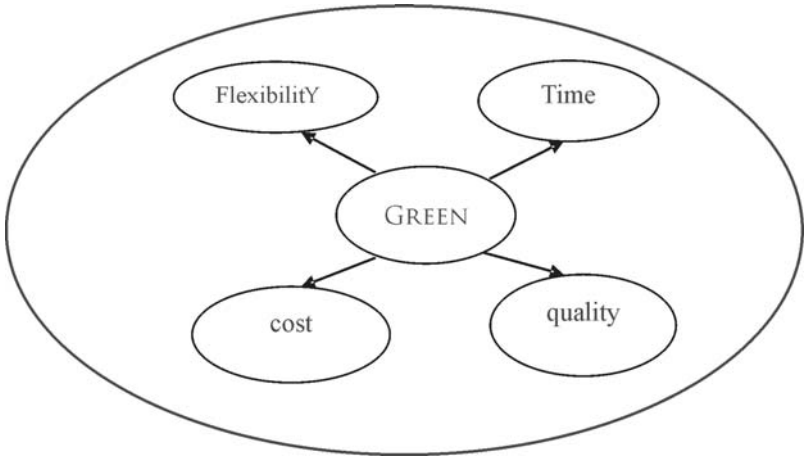


Figure 1: Green flexible manufacturing and competitive manufacturing strategies

The sustainability refers meeting the needs of the present generation without compromising the ability of future generations to meet their own needs (World Commission on the Environment and Development, 1987). With this definition all eco-friendly approaches, methodologies and research to preserve environmental conditions and resources through wastes reduction, prevention or recycling can be categorized under sustainability. Sustainability is a concept and a paradigm that has its different implementation and interpretation at different fields. For example, it is defined in the business field as "adopting business strategies and activities that meet the needs of the enterprise and its stakeholders today while protecting, sustaining and enhancing the human and natural resources that will be needed in the future" (Deloitte and Touche, 1992). Green manufacturing deals with maintaining sustainability's environmental, economical and social objectives in the manufacturing domain. Reducing hazardous emissions, eliminating wasteful resources consumption and recycling are examples of sustainable green manufacturing activities.

Green flexible manufacturing systems can be defined as the creation or improvement in flexibility of products or processes involved in energy saving, pollution-prevention, waste recycling, green product designs, or corporate environmental management that aims to prevent or reduce environmental impacts and contribute to environmental sustainability (Chen et al. 2006). To investigate the effective patterns of green flexible manufacturing systems adoption, we conceptualized framework as shown in figure 2 which consists of applications of AMT, green product design and green process design which are consistent with prior studies (Zhang et al. 2006). Application of AMT refers to technologies that focus primarily on product definition, design, and related information processing functions, which includes computer-aided process planning (CAPP), computer-aided design (CAD), computer-aided engineering (CAE), product data

management (PDM), and rapid prototyping. In these terms, the essential characteristic of AMT is its application of computers to manage data associated with manufacturing processes (Sohal et al.2006). For flexible green manufacturing, AMT is one of the important factor. It refers to a multi-dimensional concept that focuses on technologies comprising the "factory automation" component of computer-integrated manufacturing (Swink and Nair, 2007; Das and Jayara, 2003). AMT presents the important strategic resource (e.g., technological knowledge, expertise, and information) and an integral part of organizational capabilities that associated with green flexibility activities. Since flexibility performance is largely dependent on the assets or resources that firms own internally (Wagner et al. 2011) the implementation of AMT provides critical resources and capabilities that enable a firm to respond to increasing environmental pressure by designing and producing green products and processes. As a result, AMT is vital for establishing and sustaining a defensible competitive advantage in green innovation flexibility.

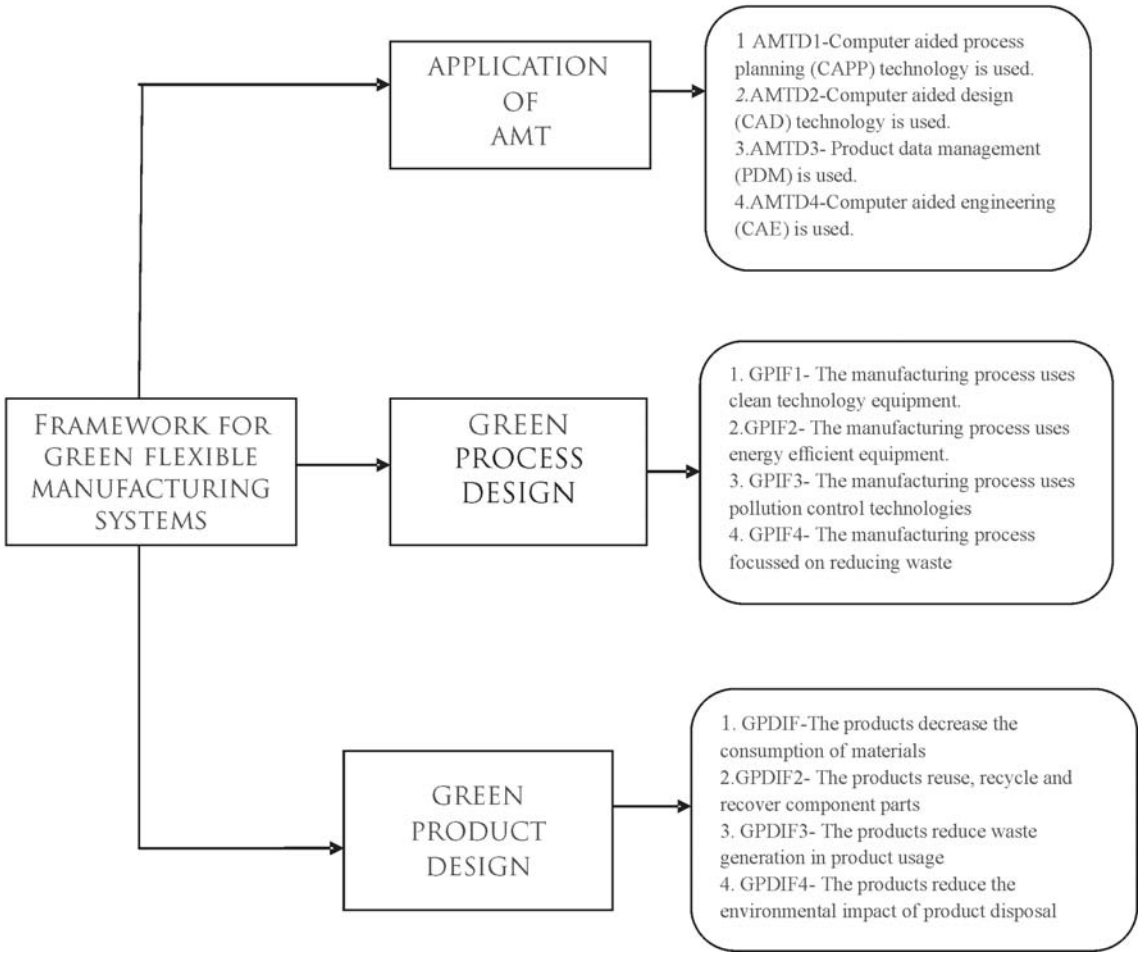


Figure 2: Framework for green flexible manufacturing systems

Second important factor is green product design. It refers to environmental product design that helps to reduce resource, control pollution, manage waste costs, and decrease the negative impact on the environment. Companies that pioneer green product design can improve their product design, quality, and reliability with respect to environmental concerns, which can yield a better chance to gain the "first mover advantage" and thus improve their corporate image, develop new markets, and further obtain competitive advantages (Chen, 2008).

Third important factor is green process design. It refers to an improvement in the existing process and/or a generation of new processes that involve green manufacturing technologies or equipment to avoid or reduce environmental damage and lead to environmental improvements. Green process design not only prevents costly pollution, but also reduces resource expenses and overall costs (Orsato, 2006). Companies can undertake green process design to enhance resource productivity and manufacturing efficiency, thus obtaining cost advantages. Both green product and process design can enhance the performance of environmental management and help businesses develop new market opportunities to increase competitive advantage (Chen, 2008)

Research Methodology

As this study is trying to propose a framework for green flexible manufacturing system, for prioritising different sub factors of the framework, AHP approach is used.

AHP is the multiple criteria decision making tool. This is an eigen value approach which is very simple to calculate. The AHP has found widespread application in decision making problems involving multiple criteria in systems of many levels. This method has the ability to structure complex, multiperson, multiattribute and multi period problem hierarchically. According to Chhabra and singh (2016), the advantage of AHP lies in its flexibility by which it can be integrated with various techniques like quality function deployment (QFD), fuzzy-based logic, linear programming, etc. This facilitates the researchers to realise their research objectives more effectively by drawing benefits from all the methods collectively. The AHP can be very useful in involving several decision makers with different conflicting objectives to arrive at a consensus decision (Singh, 2012; Bhandari et al., 2017).

It also provides a methodology to calibrate the numeric scale for the measurement of quantitative as well as qualitative performance. The scale ranges from 1 to 9. Some key and basics steps involved in this methodology are:

1. State the problem and broaden the objectives of the problem.
2. Identify the criteria that influence the behaviour.
3. Structure the problem in a hierarchy of different levels constituting goal, criteria, sub - criteria and alternatives.
4. Compare each element in the corresponding level and calibrate them on the numerical scale. This requires n (n-1)/2 comparisons, where n is the number of elements with the considerations that diagonal elements are equal to 1 and the other elements will simply be the reciprocals of the earlier comparisons.
5. Perform calculations to find the maximum Eigen value, consistency index CI, consistency ratio CR, and normalized values for each criteria / alternative.
6. If the maximum Eigen value, CI, and CR are satisfactory then decision is taken based on the normalized values; else the procedure is repeated till these values lie in a desired range.

7. AHP helps to incorporate a group consensus. Generally this consists of a questionnaire for comparisons of each elements and geometric mean to arrive a final solution.

The nine-point scale (Table 1) was used to allocate relative scores to pair wise comparisons among the important factors. The experts were asked to assign a score to each comparison using the nine point scale. This method continued till all levels of the hierarchy and finally a series of judgement matrices for the important factors were obtained.

Table 1: Scale for pair wise comparisons (Saaty, 1994)

Intensity of numbers	Explanation	Definition
1	Two activities contribute equally to the objective	Equal preferred
3	Experience and judgement slightly favour one activity over another	Moderately preferred
5	Experience and judgement strongly favour one activity over another	Strongly preferred
7	An activity is favoured very strongly over another; its dominance demonstrated in practice	Very strongly
9	The evidence favouring one activity over another is of the highest possible order of affirmation	Extremely preferred
2,4,6,8	When compromise is needed	Intermediate values between the two adjacent judgement

Results and discussions

There are a number of factors for achieving green flexible manufacturing systems which can be implemented. Out of them following are important:

1. Application of AMT
2. Green process design
3. Green product design

Pair wise comparison and weight calculation for the factors of green flexible manufacturing systems are as follows and shown in table 2:

Table 2: Pair wise comparison and priority value calculation for the factors of green flexible manufacturing system

	Application of AMT	Green process Design	Green product Design	Priority Value
Application of AMT	1	1/2	1/3	0.164
Green process design	2	1	1/2	0.297
Green product design	3	2	1	0.539

χ_{max}(Maximum eigen value) = 6×0.164 +3.5×0.297+1.833×0.539 =3.01

CI (Consistency Index) = χ_{max}-n / n-1

= 3.01-3 / 3-1

= 0.05

CR (Consistency Ratio) = CI / RCI (Value from table 3)

= 0.05 / 0.58

= 0.0862

= 8%

Where RCI= Random Consistency Index

Table 3: Average random index values, (Saaty, 1980)

N	1	2	3	4	5	6	7	8
RCI	0	0	0.58	0.90	1.12	1.24	1.32	1.41

If the value of CR is less than or equal to 10%, judgements are considered consistent or feasible.

There are 4 main important subfactors of application of AMTs for achieving green flexible manufacturing systems.Pair wise comparison and priority value calculation for the sub factors of application of AMTs for green flexible manufacturing system is shown in table 4.

Table 4: Pair wise comparison and priority value calculation for the sub factors of application of AMT for green flexible manufacturing systems

	AMTD1	**AMTD2**	**AMTD3**	**AMTD4**	**PV**
AMTD1	1	1/2	2	1/3	0.171
AMTD2	2	1	2	1/2	0.260
AMTD3	1/2	1/2	1	1/3	0.120
AMTD4	3	2	3	1	0.450

λ_{max}= 4.08 CI= 0.027 CR=3%

There are 4 main important subfactors of green process design for green flexible manufacturing systems. Pair wise comparison and priority value calculation for the sub factors of green process design for green flexible manufacturing is shown in table 5.

Table 5: Pair wise comparison and priority value calculation for the sub factors of green process design for green flexible manufacturing systems

	GPIF1	GPIF2	GPIF3	GPIF4	PV
GPIF1	1	2	1/4	1/3	0.142
GPIF2	1/2	1	1/3	1/2	0.115
GPIF3	4	3	1	3	0.497
GPIF4	3	2	1/3	1	0.246

λ_{max}= 4.26 CI= 0.086 CR=9%

There are 4 main important sub factors of green product design for green flexible manufacturing system. Pair wise comparison and priority value calculation for the sub factors of green process design for green flexible manufacturing systems is shown in table 6.

Table 6: Pair wise comparison and priority value calculation for the sub factors of green product design for green flexible manufacturing systems

	GPIDF1	GPIDF2	GPIDF3	GPIDF4	PV
GPIDF1	1	1/3	1/2	1/3	0.107
GPIDF2	3	1	1/2	1/2	0.209
GPIDF3	2	2	1	1/3	0.235
GPIDF4	3	2	3	1	0.444

λ_{max}= 4.25 CI= 0.083 CR= 9%

A summary of local and global weight of factors and sub factors for green flexible manufacturing system is shown in table 7.

Table 7: Local and global weight

	Local Weight	Global weight
Design AMT	0.164	
AMTD1	0.171	0.028
AMTD2	0.260	0.043
AMTD3	0.120	0.020
AMTD4	0.450	0.074
Green process design	0.297	
GPIF1	0.142	0.042
GPIF2	0.115	0.034
GPIF3	0.497	0.148
GPIF4	0.246	0.073
Green product design	0.539	
GPIFD1	0.107	0.058
GPIFD2	0.209	0.113
GPIFD3	0.235	0.127
GPIFD4	0.444	0.239

On the basis of this study, it is found that Green product design has most important factor (0.539) for achieving green flexible manufacturing systems followed by green process design (0.297) and application of AMT (0.164) at local level.

At global level, the products reduce the environmental impact of product disposal (0.239) sub factor of green product design is most important for achieving green flexible manufacturing systems followed by the manufacturing process uses pollution control technologies (0.148) sub factor of green process design, the products reduce waste generation in product usage(0.127) sub factor of green product design, the products reuse, recycle and recover component parts (0.113) sub factor of green product design, Computer aided engineering (CAE) application of AMT(0.074) and so on.

Conclusion

This paper develops a framework for green flexible manufacturing systems. In present scenario, design of product is changes from day to day basis. Hence the flexibility of the process for manufacturing of the products plays an important role. Findings of this paper will help to sustain or reduce environment impact by means of applications of AMTs, green product design and green process design.AHP approach is used to analyse the data. On the basis of this study, green product design (0.539) has highest ranking for green flexible manufacturing system followed by green process design (0.297) and application of AMTs(0.164). This study is carried out with well prepared plan. However, inevitably there were some limitations affecting the study. Pair wise comparison of factors is based on perception of experts. Mainly crisp data is used. As a future scope of study, fuzzy AHP may be applied. Framework for green FMS may be also validated with empirical analysis.

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Impact of Lean Manufacturing in Bulker Manufacturing Organization: A Case Study

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Abstract

Growth of any manufacturing industry depends on its work culture and its focus towards resolving various manufacturing and management related issues within the organization. Organizations frequently search for the tools and techniques either to improve the productivity or to reduce the production cost in order to maximize the competitive advantage. According to previous studies lean manufacturing system (LMS) is one of the most successful improvement concept to eliminate waste and non–value adding activities that obviously occurs in industries. This study was conducted within three months in Akshay industries which is bulker manufacturing unit located at Govindpura Bhopal. In this study lean and other tools and techniques such as Jidoka (Autonomation), JIT, Kaizen, Kanban, Muda, Poka-Yoke, TPM and 5S were implemented in order to find out areas for the reduction of waste, work load and improving the efficiency of the organization. The results of this study have shown positive improvements in the company. LMS results in significant reduction in indirect cost of bulker manufacturing, simultaneously it improves the smoothness in working of organization. Change in the cutting plan also reduces the scrap of the sheet metalsignificantly. LMS has potential to further improve the performance in future.

Keywords: Bulker manufacturing industry; Kaizen;Lean manufacturing;Lean tools; Scrap reduction.

Introduction

Bulker Industry

Bulker is a means of material transport which is generally not known to the peoples except those who are related to the industry that is why it needs an introduction. Bulker manufacturing industry is one of the growing industries in India. Demand of bulker in the market is increasing day by day as it is the safest and most appropriate means of transporting materials in powder form. Bulker is a shelled structure made of sheet metal which is used to carry fly ash, cement and other material in form of powder. Bulker manufacturing industry has a great demand of bulkers in the cement industries for transporting cement in very large quantity and in power plants where fly ash is continuously produced as a byproduct of coal and needs to be carried to some other place (www.akshaybulker.com).

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This industry is one of the most unorganized industries as there are various operations that need to be performed and several sheet metal parts need to be manufactured at the same time. Manufacturing of bulker starts primarily with the cutting of various parts of different shape and size from sheet metal plate (mild steel). Because of continuous production, there is a lot of scrap which gets piled up around the cutting bed of plasma cutting machine. Secondarily, various sheet metal parts and other attachments are joined by welding and after that painting is done which also generates continuous scrap or waste. This industry frequently undergoes many problems related to material handling, material management, store management, scrap management, machine maintenance and miscellaneous. To overcome these issues and to reduce scrap or waste material, lean manufacturing philosophies need to be introduced in this industry.

Need for improved methodology

Companies and industries must continuously search for ways to remain competitive and keep going in the market. Lean manufacturing is one of the best suitable methodologies which help in improving the performance of manufacturing industry (Choomlucksana et al., 2015). Lean manufacturing is focused on continuously eliminating non-value added activities and maximizing value added activities through reducing costs and increasing the quality of organizational processes. Normally, non-value added activities add costs to the product without enhancing the value. Non-value added activities can be called as waste in lean manufacturing. Non-value added activities or waste refers to any activity that does not add value to the process and to activities that a customer would be unwilling to pay for (George, 2002).

Research Objectives

- To map the current manufacturing system of the selected company in order to understand the existing process.
- To identify the various lean manufacturing tools which can help in improving the performance of the Akshay Industries (Bulker manufacturing) Govindpura, Bhopal.
- To identify the impact of various lean manufacturing tools over the industrial performance.
- To compare the previous and present performance of the industry.

Literature Review

Lean is a production philosophy which considers that any activity which consumes resources but not create value for the end customer is wasteful and should be eliminated (Womack et al 1990; Shah and Ward 2007; Antony 2011). According to Sohal (1996) lean production eliminates unnecessary processes, align processes in continuous flow and solve problems through continuous improvements. In industries it is carried out through a set of lean practices.

Lean manufacturing offers various tools and techniques to tackle and identify different types of waste effectively and improve efficiency in different situations (Bon et al., 2015). Various tools and techniques offered by lean manufacturing are 5s, kaizen, standardized work, plan-do-check-act (PDCA), poka yoke, kanban, just in time (JIT), total productive maintenance (TPM), value stream mapping (VSM), statistical process control (SPC), Heujunka, andon, Gemba, hoshin kanri, overall equipment effectiveness (OEE), bottleneck analysis, key performance indicators (KPI's), quality management program, scrap reduction, etc

According to Choomlucksana et al. (2015), by applying lean manufacturing principles the processing time of polishing stage in a sheet metal stamping industry was reduced from 6582 seconds to 2468 seconds or by 62.5%. Also non value added activities were reduced from 1086 activities to 261 activities or by 66.53%. Furthermore, overtime cost was reduced by

1764 Dollar per year. Lean tools implemented or used during this study period were visual control, poka yoke and 5S.

Considering small and medium sized enterprises Moeuf A et al, (2016) observed that the absence of functional organization, lack of methodology and deficiency of formal procedures are often the cause of difficulties experienced by SMEs during the implementation of Lean practices

Thus, it is understood that implementation of lean manufacturing practices has resulted in improvement in productivity and profitability in many organizations.

Research Methodology

As we can say that lean manufacturing is a fairly new concept in India, the intent of this research paper was to assess the current state of lean implementation in a bulker manufacturing industry.

The research methodology of this study is based on the combination of detailed interviewing technique, a survey based on a well set questionnaire on various tools of lean manufacturing and personal observations.

This bulker manufacturing industry is located at Govindpura industrial area Bhopal.

In the detailed interviewing technique various questions were asked from the head of the company in order to get the core details and information about the organization which helps in accessing the current working state of the organization.

A survey is also conducted by preparing a set of questionnaires which were answered by two respondents.

The items used in this questionnaire were initially developed reviewing different studies including Panwar et al (2015), on lean implementation in process industry. This covers questions related to lean tools, reasons of not implementing lean, and reasons of implementing lean manufacturing in that organization.

There are other set of questionnaire which were asked about the implementation level of various lean tools within the organization.

Other than this, a set of questions were also prepared which comes under the heading of principles of lean manufacturing. For measuring 5S implementation, questionnaires for various 5S parameters were also prepared apart from itself being a lean tool.

Another set of questions were prepared under the heading working state which tries to gain the information about the working condition of the industry which will provide the figures for the closeness to their ideal working condition and another set for case study (www.imcpa.com).

A five-point Likert scale was developed for each item of lean practices using the following criteria:

1. no implementation (0 percent);
2. little implementation (around 25 percent);
3. some implementation (around 50 percent);
4. extensive implementation (around 75 percent); and
5. complete implementation (100 percent).

Table 1 gives the details of the question and score on 5 point Likert scale

Table 1: Principles of lean manufacturing (Source: Self analysis)

Principles of lean manufacturing		
1	Standardized work	4.5
2	Kaizen	4.5
3	Quality programs	5
4	Pull system	4
5	Value stream mapping(analyze the current state and designing a future state for the series of events that take a product or service from its beginning through the customer)	3.5
6	Flow orientation	4.5
7	Employee involvement	5
8	Visualization	4.5
9	Customer focus	5
10	Stability and robustness	3.5
11	Workplace management	4
12	JIT (Just In Time)	4
13	Elimination of wastage	4.5
14	Continuous improvement	4
Mean		**4.37**

Table 2: Lean tools 1 (Source: Self analysis)

Lean tools 1		
1	5S	4.5
2	Total productive maintenance (TPM)	4.5
3	Visual control	4
4	Statistical process control (SPC)	4
5	Quality management program	4
6	Takt time (the rate at which a finished product needs to be completed in order to meet customer demand)	3.5
7	Poka yoke/error proofing	4
8	Scrap reduction	4
9	Two bin auto replenishment system	4
10	Heijunka/production smoothening/line balancing	4.5
Mean		**4.10**

Table 3: Lean tools 2 (Source: Self analysis)

Lean tools 2		
1	PDCA (plan, do, check, act)	4
2	KPIs (key performance indicators)	5
3	Jidoka (autonomation)	4.5
4	Gemba (the real place)	4
5	Andon (real time communication)	4
6	Bottlenecks analysis (strengthening weakest link)	4.5
7	Continuous flow (eliminate many forms of waste inventory,waiting time and transport)	4
8	Hoshin kanri (policy deployment)	4
9	Muda (waste)	5
10	OEE (overall equipment effectiveness)	4
Mean		**4.40**

Table 4: 5S (Source: Self analysis)

5S		
1	Seiri (sort/eliminate which not needed)	4
2	Seiton (set in order/organize remaining items)	4.5
3	Seiso (shine/ clean and inspect work area)	4
4	Seiketsu (standardize/write standards for above**)**	4.5
5	Shitsuke (sustain/.regular apply the standards)	5
Mean		**4.40**

Table 5: Working state (Source: Self analysis)

Working state		
1	Your actions and activities aligned to your goals	4
2	You have the right inventory at the right places	5
3	You spend much time in observing	4
4	You have standard	4.5
5	Your tools always in the right places to help you to do the right things	4.5
6	Your Problem solving techniques are effectively working	4.5
7	You do sustainable changes	4.5
8	You try to surface or burry problems	4.5
9	Your kanban signals the right amounts	4
10	Your processes are visual	4.5
Mean		**4.40**

Table 7: Waste parameters (Source: Self analysis)

7 Waste parameters (Sources of waste)		
1	Over production	1
2	Waste of unnecessary motion	2.5
3	Waste of inventory	3
4	Production of defects	1.5
5	Waste of waiting	2
6	Waste of transportation	2
7	Waste of over processing	1.5

Table 7: Reasons of implementing lean (Source: Self analysis)

Reasons of implementing lean		
1	Elimination of wastes	3.5
2	To decrease production cost	3
3	To improve quality	4.5
4	To facilitate JIT production	3.5
5	To increase demand management efficiency	4
6	To increase customer satisfaction	3.5
7	To increase supply chain efficiency	4
8	To increase utilization of space	3.5

Table 8: Reasons of not implementing lean (Source: Self analysis)

Reasons of not implementing lean		
1	Production process is complex	2
2	Lack of education and expertise on lean	2.5
3	Lack of financial resources	2
4	Lack of time	1.5
5	Cultural barriers (Resistance to change)	1.5
6	Lean is complex to implement	2.5
7	Lack of senior management interest and support	1.5
8	Lack of area utilization/Limited area	2.5
9	Due to simultaneous work in various bays	2
10	Non availability or shortage of any component	2
11	Lead time is not specified for various components in the store	2

This methodology also comprises of personal observations and readings in order to access through the whole working process of the organization. It includes both technical as well as managerial aspects of the organization. These are the observations for the duration of three months in order to collect various data of the organization.

Various changes are implemented under different lean tools which are given as follows-:

a. Kaizen

Under kaizen,, the change in cutting plan is implemented. First of all in which dish cutting is changed as in previous working state the dish is to be cut by joining two sheets of dimensions 5×1530×7500 as the maximum diameter of dish to be cut is 2000 mm, the rest of the sheet metal left after cutting the dish is scrap so to minimize the scrap coming out of the dish cutting, a sheet having width of 2000 mm is ordered which reduces scrap from 58% to 35% when calculating over circular dish of diameter 1750 mm. This also eliminates extra cost and time for welding of two sheets which finally forms dish as shown in Figure 1.

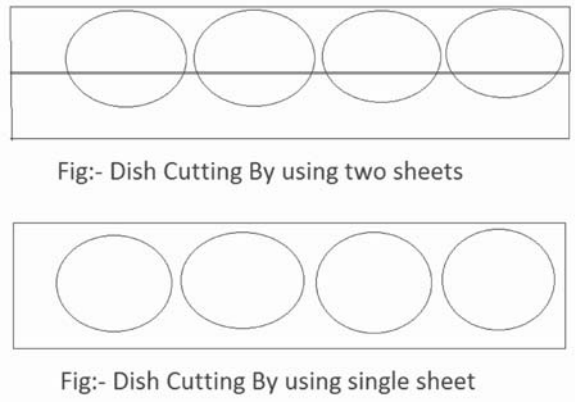


Figure 1: Dish Cutting Plan (Source: Own creation)

As in Figure 2 the previous process flow chart shows that the outer leakage and surface testing is performed after primer painting. Due to some technical issues the outer leakage and surface testing is performed before primer painting as shown by the current process flow diagram in Figure 3. As after primer painting, if any leakage is detected then it is proofed by welding, when welding is performed over primer painted surface, it damages the nozzle of the CO2 welding machine. The nozzle of CO2 welding machine is very costly. So by applying these changes the reduction in damage of CO2 nozzle is reduced by 20%.

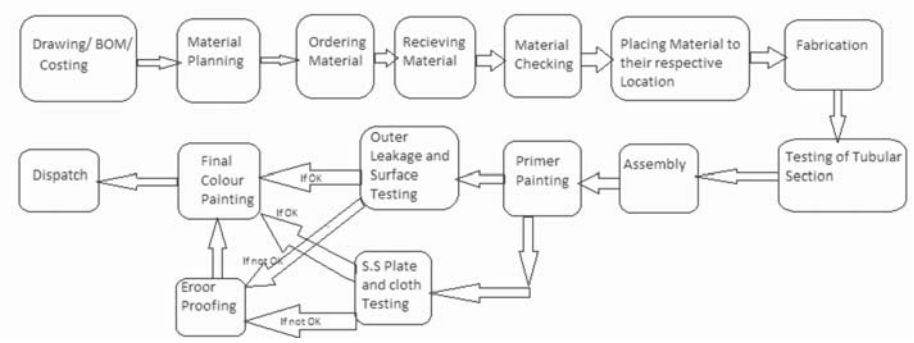


Figure 2: Previous process flow diagram (Source: Own creation)

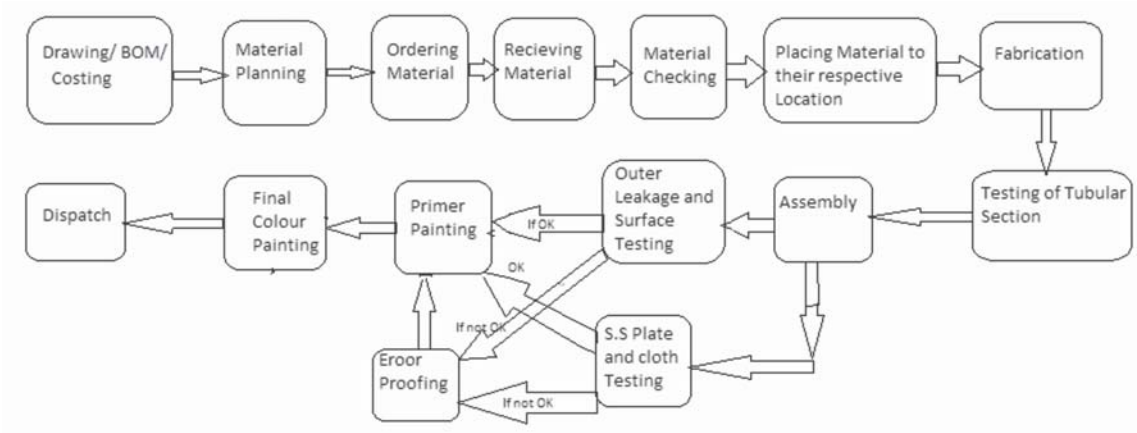


Figure 3: Current process flow diagram (Source: Own creation)

b. Autonomation (Jidoka)

It can be defined as automation with human touch. Under this tool the approach area of hoist is increased from 50% to 75% of the total area of the industry as shown in Figure 4 and Figure 5 which reduces the extra cost paid to the hydra crane vendor on each call on per hour basis. Simultaneously it also reduces human effort and waiting time for other relevant operations. This change in approach area can be seen in plant layout.

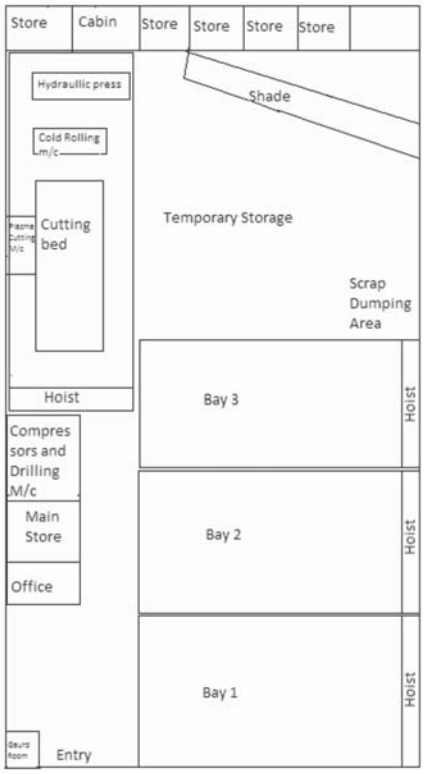


Figure 4: Old Plant Layout
(Source: Own creation)

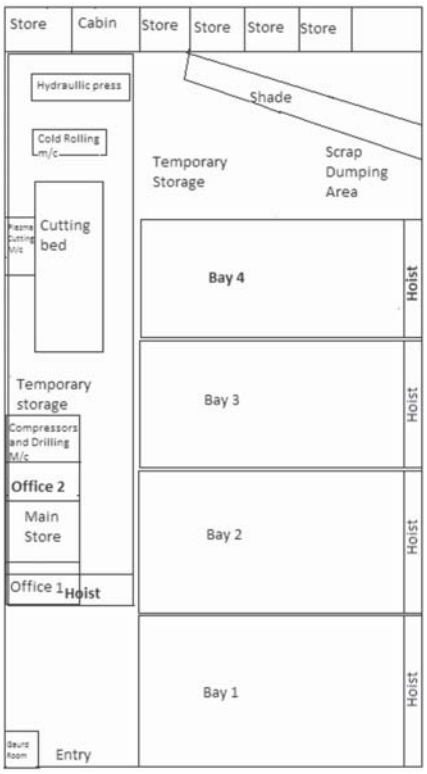


Figure 5: New Plant Layout
(Source: Own creation)

c. Andon

This is the real time visual feedback system of the plant floor that indicates current production status. So under this tool an Office 2 is built at the left centre of the industry which can be seen in the plant layout in Figure 5. Initially there was 0% real time visual feedback from the main office as shown in Figure 4 and from office 2 it gives around 50% of real time visual control over production system.

d. Poka yoke (Error Proofing)

This is one of the tools of lean manufacturing which focuses on minimizing the defects or errors in the final product so under this tool material and product is tested at various stages which are

- Checking of material at the time of receipt
- Checking of Dish dimensions
- Checking of shell dimensions
- Tubular section testing
- Outer leakage testing
- Surface finish testing
- Grinding test
- Welding test
- Color paint testing

e. Takt Time

It is the pace of production that aligns production with customer demand calculated as planned production time/Customer demand. It provides a simple, consistent, intuitive method of pacing production. So for this industry takt, time can be measured as total number of units manufactured per month. The information gathered from the interview reflect that if the pace of production is 20 units/month then it is a no profit no loss condition. Normally the pace of production of this industry is 30 units/month.

Case study

Asper the information provided by the employees of the industry, the industry works as per the demand of the customers for which he is spending large amount of money. They regularly survey their customers for input features which add value to the product and customers are willing to pay for the same. They used to bring their valued customers to the plant and note down any comments for changes to look business practices through customer's eyes. The old working condition and new working conditions are quite different from each other. Few changes were implemented and it is continuously being tried to make many changes in future. The availability of space as per the production rate of the industry is vey less so there is obviously a patchwork of add-on processes and equipments dropped where space was available without thought to a smooth production flow or efficient use of operators, but they try to locate equipments for a smooth flow. They keep on trying to challenge their employees for improved operations and recognition. In addition to that there is provision for numerous award and incentive programs to suggest improvements and identify ways to eliminate unnecessary steps in an effort to become lean. They have an automated system to collect input and a reward system. They have trained their employees in such a manner that employees view each other as customer which means employees understand how their output impacts someone else's process or that they are the "customer" receiving material from upstream. If we talk about their inventory turnover

rate they have better than the average. On discussing about the communication, needs and timeframes with the distributer and supplier they are well connected to each other.

Results and Discussions

Table 9: Outcome of various lean parameters (Source: Self analysis)

Principles of lean manufacturing	4.37
Lean tools 1	4.10
Lean tools 2	4.40
Overall lean performance (lean tools 1 & lean tools 2)	4.25
5S	4.40
Working state	4.40

Table No.9 compiles the outcome of various lean parameters from Tables 1, 2, 3, 4, 5. The implementation of lean tools is fairly well in this industry according to the input given by the employee of the industry because all the parameters in the Table no.9 are greater than 4 which varies from 4.10 for lean tools 1 to 4.40 for 5S and working state simultaneously of the industry. It can also be concluded that there is a scope for improvement in all the factors primarily set in the questionnaire.

From the table No.6we can easily identify that the factors which are mostly responsible for the waste in the industry are waste of inventory and waste of unnecessary motion.

The factors due to which the lean manufacturing needs to be implemented from Table no.7 are to improve the quality and to increase supply chain efficiency with rating of 4.5&to increase demand management efficiency simultaneously with a rating of 4.

The factors due to which the lean manufacturing sees the difficulties in implementation from Table 8 are lack of education and expertise on lean,lean is complex to implement, lack of area utilization/limited area with simultaneous maximum rating of 2.5 as compared to other factors.

There are various changes implemented under different lean tools which are given as follows along with the factors and their final result as well -:

Conclusions

The main purpose of this study was to map the current manufacturing system of the identified company in order to understand the existing process, identify the various lean manufacturing tools which can help in improving the performance, to identify the impact of various lean manufacturing tools over the industrial performance and to compare the previous and present performance of the industry. From the analysis done, it can be easily concluded that lean manufacturing tools have a very positive impact on the performance of the organization

The most dominating factor among all waste factors is waste of inventory. This means that the material handling and distribution among all the contractors needs to have a special focus.

The findings of this study show that the implementation of all the lean tools,e.g kaizen, jidoka, andon, takt time and poka yokeis very impressive and improved the performance of the industry in terms of time, money and reduced wastage as well.

Limitation and Future Scope

This case study was conducted only over a single industry and on a single bulker out of its various variants manufactured by the industry. If the study is conducted over more than one

Table 10: Impact of lean tools on industrial factors (Source: Self analysis)

Lean tools	Factors	Impact
Kaizen	Dish cutting scrap	Reduced from 58% to 35%
	Damage of CO2 nozzle	Reduced by 20%
Autonomation (Jidoka)	Hoist approach area	Increased from 50% to 75% and deduction in hydra crane call up.
Andon	Visual feedback	Increased from 0% to 50%
Poka-yoke	Error proofing	Testing at various stages eliminates defects in the final product.
Takt time	Pace of production	Fluctuates as per the demand

industry then we could have more knowledge about the manufacturing sector ofbulker industry and its work culture. The calculations for dish cutting are also limited to single variant of dish only. Every industry has their own secrets especially their financial status and strategies which they do not reveal due to which this study is only limited to external inputs and outputs

The future scope of this work can be of wider range in this industry, we have taken only limited number of tools into account and their effect on the performance of the industry. The tools we have taken into consideration for study were kaizen, jidoka, poka yoke, andon and takt time. These are other tools which we have studied on a macroscopic level of the organization, but there are other tools which work on the microscopic level of the organization and better results of the impact of lean manufacturing on bulker manufacturing industry can be obtained.

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Ranking of Best Practices of Logistics Service Providers using Fuzzy AHP

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Abstract

Due to globalization and increase in e-commerce businesses, the scope of Logistics Service Providers (LSPs) is expected to grow exponentially in India. In order to sustain and grow, LSPs need to provide quality services to organizations. The objective of this paper is to identify the best practices followed by Indian LSPs and to rate the identified best practices by using Fuzzy AHP methodology. The best practices are categorized into four major categories, that is strategic, operational, technical and societal on the basis of literature review and expert opinion. Further, twenty best practices were identified as sub- categories under above defined categories. The experts were asked to rate each of these twenty factors in terms of their importance. Further, a Fuzzy AHP approach was applied for prioritizing best practices. Based on priority weights, different categories can be ranked in descending order as Operational (0.45), Strategic (0.41), Technical (0.10) and Societal (0.03).The findings of the study shows that the top four prioritized factors among all the twenty factors are safe shipments, use of eco-friendly fleet, reduction in carbon emission and timely delivery. The study will enable the organizations to understand the strengths and practices used by Indian LSPs in order to provide better service quality and timely delivery to their committed shipments. The research will also help unorganized and budding LSPs to identify the factors on which they can improve and excel to fulfill the dynamic market needs.

Keywords: Logistics Service Providers, Service Quality, Best Practices, Fuzzy AHP methodology.

Introduction

Due to advancement in technology and significant developments in the Indian economy, the logistics sector is transforming to align with changing business requirements. Logistics is considered as the backbone of an economy and it contributes around 13% in GDP as against 7-8% in developed countries. In past few decades, the logistics sector has shown tremendous growth and at present, it has reached to around US $225 billion industry. The logistics sector will continue to show the robust growth of around 10-15% annually to match the pace of growth of the economy. The growth in Indian economy is bringing lots of opportunity for logistics sector to grow in terms of increase in volume handling, large traffic volume, and increase in network coverage. In India, Logistics sector is the interplay of infrastructure, technology and logistics service providers, which manages the efficient flow of goods from the point of origin to the point of consumption. Despite of few weaknesses, logistics sector is witnessing huge growth

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in retail, e-commerce and manufacturing sectors. Most of the organizations are taking support from logistics service providers in order to reduce cost and to provide efficient and timely services to the end customers. Logistics Service Providers (LSPs) or 3Pl provides various services including transportation, freight forwarding, warehousing, container services, shipping services, express cargo delivery and value added services etc. to manage all logistical activities in the entire supply chain smoothly. At present, organized logistics players are adopting latest techniques and technologies in order to meet increased and dynamic logistics requirements. Many best practices followed by LSPs to bring transparency, to enhance service quality and to improve collaboration and coordination among supply chain members.

In this paper, an attempt has been made to identify the best practices followed by Indian LSPs and rank them on the basis of their importance by Fuzzy AHP. The objective of the paper is to highlight the best practices adopted by logistics providers in order to serve end user with quality services. The paper is organized as follows. After introduction, literature review is discussed in Section-2. Section-3 deals with the model development and research methodology is discussed in Section-4. Section-5 contains findings and concluding remarks and implications of study in section-6.

Literature Review

From last three decades, many research has been done on logistics providers and logistical services provided by LSPs. Marasco (2008) analysed 152 articles published from 1989 to 2006 in 33 international journals. Busse and Wallenburg, (2011) provided comprehensive review of innovation practices of logistics management from 2001 to 2009. In general, outsourcing refers to giving some part of business to third party for the benefit of cost reduction and better customer services. Nowadays, Third party logistics (3PLs) become more important for logistics sector.

LSPs services are extended from transportation and warehousing into integrated logistics solutions in form of all shopping at one stop(Kumar et al.,2012). Sahay et al.(2006) found that the common logistics services in India are inbound and outbound transportation, warehousing activities, order fulfillment and fleet management. Gilaninia et al.(2011) and Fasanghari et al.(2008) highlighted the importance of information technology in effective coordination among all supply chain partners. Supply chain integration being an important component for increasing effectiveness and profitability of LSPs is discussed by many authors (Jayaram et al.(2010); Huang et al.,2014) Declining margins and a tougher competitive environment together are the main driving factors for the growth of 3PL (Tan et. al). Flexibility in service (Naim et. al, 2010), value added services (Soinio et al.,2012), optimal delivery time (Ulku and Bookbinber,2012) and network optimization (Basligil et al.,2011) are also found most frequently used outsourced logistics functions. Many studies exist in literature on latest logistics practices like innovation management (Busse and Wallenburg, 2011), green supply chain() and reverse logistics (Govindan et al.,2012).

Globalization has been a major reason for organizations to redesign their strategies, develop products to meet international market needs and enhance capability to reach globally (Kumar et al., 2012). This requirement gives full opportunity to logistics providers to come up with wide market reach and better connectivity with other nations. Many developed countries are in phase of well-established logistics providers handling all non-core activities whereas few are still in infancy phase (Tan et. al, 2014). Bhatnagar et al.(1999) have analysed that more than 50% of firms outsource shipment consolidation to logistics providers whereas around 40% outsourced order fulfillment, carrier selection and freight payment in Singapore. Logistics outsourcing practices are comparatively slower in North America and Latin America than Asia-Pacific Region and Western Europe (Kumar et al.,2012).

Existing literature suggests that best practices followed by LSPs are inclined more by top management. The new ideas, new policies and innovation are usually initiated by senior management of an organization and finally turned into applicable strategies. Hoek et al. (2008) suggested that the other peer departments must be internally aligned with supply chain partners to improve the efficiency of the entire process. Ellinger et al. (2007) examined the market orientation and the development practices followed by manpower also influences the performance of logistics service providers. Network Planning and enhancing the existing network, network distribution management by hub and spoke systems are the important components of strategic planning (Zapfel and Wasner, 2002). The management always prefers to audit all the processes to maintain control and transparency in system. LSPs need to maintain confidentiality of the entire customer data used in transactions so top management gives high importance to this concern. As operational best practices, the prime focus of LSPs is to deliver the safe shipments in committed time (Stank et al., 2003).

The best practices are broadly categorized into four categories- strategic, operational, technical and societal. The sub-categories taken under each category is defined in table 1 along with corresponding references.

Table 1: Literature Review on Best Practices followed by LSPs

Best Practices	Definition/meaning	References
Organizational		Hoek (2008); Ellinger (2007)
Manpower Management	Managing human resources which involved in all logistics operations	Tezuka (2011); Jayaram et al.(2010); Juga et al.(2010), Wong et al.(2010); Hamdan et al.(2008); Sahay et al.(2006); Aghazadeh (2003); Becker (1996)
Network Planning and Enhancement	Planning of maintaining existing network and enhancing new dimensions as required for expansion of business	Gunasekaran et al. (2016); Soinio et al.(2012) ; Basligil et al.(2011); Gilaninia et al.(2011); Kayakutlu et al.(2011); Ellinger et al.(2008); Zapfel et al.(2002)
Audit & Control	Process to cross check the correctness of the functioning of all processes in the organisation	Gilmour (1999); Comyn-Wattiau & Akoka (1996)
Data Confidentiality	Keeping all records and data transactions w ith appropriate security measures	Jothimani & Sarmah (2014); Tweddle (2008); Farmer(1988)
Innovation & Customized Solutions	Trying out new ways to provide services along with serving customer needs in tailor -made fashion	Yeung et al.(2012); Busse and Wallenburg (2011); Huo et al.(2008); Ghobadian(1994); Farmer(1988)

Operational		Stank et al. (2003); Yeung (2006)
Safe Shipments	Ability to deliver products safely	Markovic (2006), Stank et al.(2003); Mentzer et al.(2001; Philip and Hazlett (1997); Ghobadian et al.(1994); Vandamme et al.(1993); Parasuraman et al.(1985, 1988)
Timely delivery	Ability to deliver goods on time	Kumar et al.(2012) ; Ulku et al.(2012); Yeung et al.(2012); Busse et al.(2011); Juga et al.(2010) ; Huo et al.(2008);Sahay et al.(2006); Millen et al.(1998).
Resource Optimization	Optimum use of all available limited resources to LSPs	Forslund (2012); Tezuka(2011); Jayaram et al.(2010); Naim etal.(2010); Sahay et al.(2006); Aghazadeh(2003)
Efficient Route Planning	Planning of route for efficient movement of fleet	Ravi (2014); Ulku et al.(2012); Basligil et al.(2011); Ellinger et al.(2008); Zapfel et al.(2002)
Inventory Replenishment	Adopting various ways to refill the inventory of customer at earliest	Swenseth & Godfrey (2002); Sahay et al.(2006); Waller et al.(1999)
Technical		Forslund (2012); Lai et al. (2007); Wang Fu (2006); Bharadwaj (2000)
Use of Warehouse Management Software	Usage of IT and software for warehouse management	Ketikidis et al. (2008); Doerr et al. (2006)
Data handling and extraction	Managing data handling and extraction of data through data mining tools	Evangelista et al.(2013); Kumar & Kumar (2014)
Tracking and Tracing of shipments	Using GPS technology to track and trace the exact location of pipeline shipment	Kumar & Kumar (2014); Shamsuzzoha, & Helo (2011); Hillbrand & Schoech (2007)
Use of Internet & (Electronic Data Interchange) EDI Systems	Access to internet and adoption of EDI systems for increasing transparency of processes	Evangelista et al.(2013); Gilaninia et al.(2011); Sakun(2011; Tezuka(2011); Wong et al.(2010); Fasanghari et al.(2008); ,Jharkharia et al.(2005)
Bar-Coding & RFID Systems	Techniques which helps in tracking the product or items	Ketikidis et al. (2008); Doerr et al. (2006); Gaukler & Seifert (2007)

Societal		Centobelli (2017); Mani et al. (2016)
Use of eco-friendly fleet	Usage of more green and environment friendly fleet to reduce the pollution level in environment	Colicchia et al. (2013); Lieb & Lieb (2010); LaGuardia & Srinivasan (2011)
Use of renewable energy sources	Usage of those sources which can be naturally replenish	Huang et al.(2014); Ulku et al.(2012); Tezuka (2011); Naim et al.(2010)
Use of reusable and recyclable packaging	Repeated usage of packaging either in same form or another form as recycled one	Govindan et al. (2012); LaGuardia & Srinivasan, (2011); Lieb & Lieb (2010); Sahay et al.(2006)
Reduction in Carbon emission	Step to reduce carbon emission in environment b y modifying transport and facility usage	Kim et al. (2009); Hua et al., (2011); Elheddhli & Merrick (2012)
Initiatives towards CSR	Organizations activities for society and environment as a	Juntunen et al.(2014); Colicchia et al. (2013); Lieb

Proposed Framework

As in literature review, the existing literature in best Practices has been studied. A model is proposed to understand the hierarchy of best practices usually followed by Indian LSPs (Figure 1). Almost all well-established and well known LSPs practice their operations in best possible way to ensure successful fulfillment of all commitments made to customer. At strategic level, the top management of the organization is directly involved in taking major decisions related to manpower management, network planning and enhancement, audit and control of all ongoing processes, maintaining data confidentiality and identifies new innovative and customized solutions to satisfy the customer needs in possible efficient manner. At operational level, the best practices adopted by LSPs are more focused towards the satisfactory end delivery of the services to the customer. Their preferences for delivering the best of the service quality are planning of safe shipments, timely and accurate delivery, optimizing resources efficiently, managing inventory and efficient route planning. At technical level, this is almost mandatory for LSPs to make use of latest software and tools to keep updated their customers with basic requirements of tracking and tracing of goods, warehouse management, data handling and extraction etc. The best practices followed by LSPs to make their systems technically robust are use of warehouse management systems software, use of Bar-coding and RFID technology, use of GSM-GPS technology and internet and EDI systems to make their system transparent and convenient. At societal level, almost all LSPs contributing towards Corporate Social Responsibility (CSR) in the form of making use of renewable energy resources, increasing use of eco-friendly fleet and reusable and recyclable packaging materials. Moreover, they are also giving importance to use of solar panels, tree plantation and rain water harvesting especially at their warehouses and open areas.

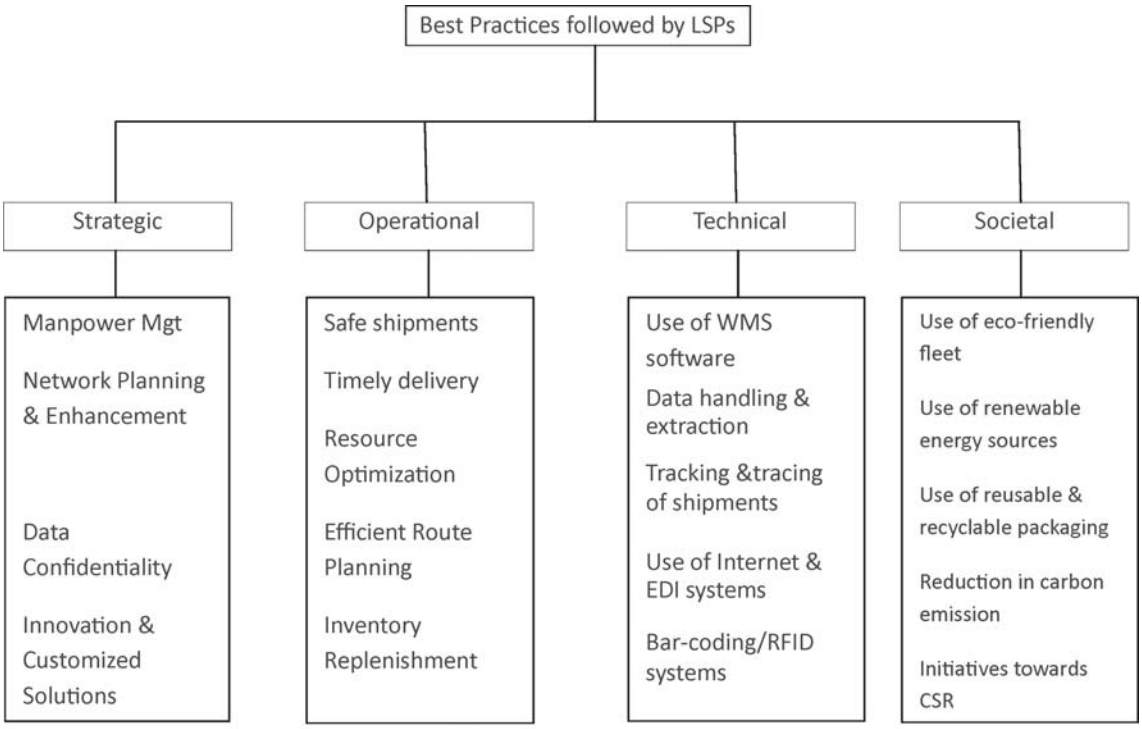


Figure 1: Proposed Model for Best Practices followed by LSPs

Research Methodology

In literature, there are various methods available for ranking best practices of LSPs. Multiple Criteria Decision Making (MCDM) is considered to be one of the most effective tools. It is widely used for dealing with unstructured problems with multiple conflicting objectives (Lee and Eom, 1990). Many approaches like Analytical Hierarchy Process (AHP), TOPSIS, Data Envelopment Analysis (DEA), DEMATEL and Interpretive Structural Modeling (ISM) etc. have been developed for solving MCDM problems (Tyagi et al., 2015). These approaches measures the alternative ratings based on the preferences or weights given by decision makers to each alternative in precise and crisp manner. In this paper, identified best practices are prioritized by using Fuzzy AHP.

Fuzzy Analytical Hierarchy Process

AHP give better results when we deal with crisp information decision applications (exact and ordinary data) but to handle uncertainties associated with the data, an additional integration of fuzzy theory is required. The advantage of Fuzzy AHP over AHP is to capture uncertain imprecise judgment of experts in pair-wise comparison and can be better applicable in dealing complexities with 3PL selection. Proposed hierarchical framework (Figure 1) will be used for applying fuzzy AHP. Linguistics scales for importance weight of each factor is given in table 2.

Let X = {x1, x2… xn} be an object set, and U = {u1, u2… um} be a goal set. According to the method of Chang (1992) extent analysis, each object is taken and extent analysis for each goal gi, is performed, respectively. Therefore, M-extent analysis values for each object can be obtained and are represented as follows:

$$M_{g_i}^1, M_{g_i}^2, \ldots, M_{g_i}^m, \quad i = 1,2, \ldots, n, \qquad \ldots(1)$$

Where, all the $M_{g_i}^j \ (j = 1,2, \ldots \ldots m)$ are triangular fuzzy numbers represented by (l, m, u), l,m and u is the least possible, most likely and largest possible. The steps of the fuzzy AHP (Chang, 1996) are as follows:

Step 1: The value of fuzzy synthetic extent with respect to the i^{th} object is defined as

$$S_i = \sum_{j=1}^{m} M_{g_i}^j \otimes \left[\sum_{i=1}^{n} \sum_{j=1}^{m} M_{g_i}^j\right]^{-1} \qquad \ldots(2)$$

To obtain $\sum_{j=1}^{m} M_{gi}^{j}$ perform the fuzzy addition operation of M-extent analysis values for a particular matrix such that

$$\sum_{j=i}^{m} M_{g_i}^j = \left(\sum_{j=1}^{m} l_j, \sum_{j=1}^{m} m_j, \sum_{j=1}^{m} u_j\right) \qquad \ldots(3)$$

and to obtain $\left[\sum_{i=1}^{n}\sum_{j=1}^{m} M_{gi}^{j}\right]^{-1}$, perform the fuzzy addition operation of $M_{g_i}^j \ (j = 1,2, \ldots \ldots m)$ values such that

$$\sum_{i=1}^{n} \sum_{j=1}^{m} M_{g_i}^j = \left(\sum_{i=1}^{n} l_i, \sum_{i=1}^{n} m_i, \sum_{i=1}^{n} u_i\right) \qquad \ldots(4)$$

The inverse of the vector in "equation (2)" can be computed as,

$$\left[\sum_{i=1}^{n}\sum_{j=1}^{m} M_{gi}^{j}\right]^{-1} = \left(\frac{1}{\sum_{i=1}^{n} u_i}, \frac{1}{\sum_{i=1}^{n} m_i}, \frac{1}{\sum_{i=1}^{n} l_i}\right) \qquad \ldots(5)$$

Table 2: Linguistic variable for importance weight of each factor

Linguistic variable	Triangular Fuzzy Numbers
Equally Important	(1,1,1)
Weakly Important	(2/3, 1, 3/2)
Fairly Important	(3/2, 2, 5/2)
Strongly Important	(5/2, 3, 7/2)
Absolutely Important	(7/2, 4, 9/2)

Source: Singh & Sharma (2014)

Step 2: The degree of possibility of $M_2 = (1_2, m_2, u_2) \geq M_1 = (l_1, m_l, u_l)$ is defined as

…(6)

and can be equivalently expressed as follows:

$$V(M_2 \geq M_1) = \text{hgt}(M1 \cap M2) = \mu_{M_2}(d)$$

$$= \begin{cases} 1, & \text{if } m_2 \geq m_1, \\ 0, & \text{if } l_1 \geq u_2, \\ \frac{l_1 - u_2}{(m_2 - u_2) - (m_1 - l_1)} & \text{otherwise,} \end{cases} \quad \ldots(7)$$

Where, d is the ordinate of the highest intersection point D between and shown in figure 2. l M_2 M_1

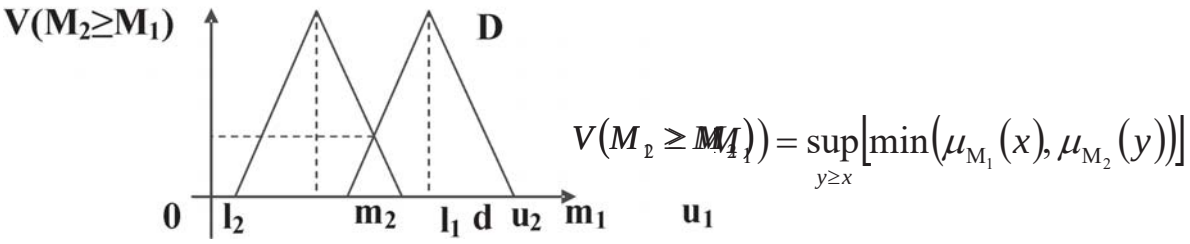


Figure 2: The interaction between triangular fuzzy numbers, M_1 and M_2

To compare M_1 and M_2, we need both the values of and .

Step 3: The degree possibility for a convex fuzzy number to be greater than k, convex fuzzy numbers M_i (i=1, 2,….., k) can be defined as

$$V(M \geq M_1, M_2, \ldots, M_k) = V[(M \geq M_1) \text{and} (M \geq M_2) \text{and} \ldots \text{and} (M \geq M_k)]$$

$$= \min V(M \geq M_i), i = 1,2,3, \ldots, k \quad \ldots(8)$$

Assume that, $d'(A_i) = \min V(S \geq S_k)$ …(9)

for, k=1,2,…..,n and k≠1. Now the weight vector can be given by the following formulae,

$$W' = \{d'(A_1), d'(A_2), \ldots, d'(A_n)\}^T, \quad \ldots(10)$$

Where Ai (i=1, 2, 3….., n) are n elements.

Step 4: Via normalization, the normalized weight vectors are given as,

$$W' = \{d(A_1), d(A_2), \ldots, d(A_n)\}^T,$$

Where "W" is a non- fuzzy number

Step 5: Integrate the opinions of decision makers and apply geometric average to combine the fuzzy weights of decision makers.

Findings of the Study

Fuzzy AHP approach is used to rank the best practices followed by Indian logistics service providers. The inputs on the best practices followed by Indian LSPs have been taken from two experts. The experts are working with well-established Indian logistics companies and they provide their insights on the best practices followed by Indian logistics service providers in general. Expert-1 is senior operation manager in leading Logistics Company with experience of more than 10 years. Expert-2 is supply chain head in well known Indian logistics company with 15 years of experience.

Pair-wise comparison of all the factors at each level is done on a linguistic scale as shown in table 2. By using Equation (1-2), the pair-wise comparison matrices of major criteria and sub criteria are developed and shown in table 3. The final individual and global weights are evaluated by using (3-10) equations by applying Fuzzy AHP method and as shown in table 4.

Table 3: Pair-wise Comparison Matrix of the Major Criteria and Sub Criteria

Table 3(a): Pair-wise Comparison Matrix of the Major Criteria

	Strategic	Operational	Technical	Societal
Strategic	(1,1,1)	(1.5,2,2.5)	(1.5,2,2.5)	(0.667,1,1.5)
Operational	(0.4,0.5,0.667)	(1,1,1)	(2.5,3,3.5)	(1.5,2,2.5)
Technical	(0.286,0.334,0.4)	(0.286,0.334,0.4)	(1,1,1)	(1.5,2,2.5)
Societal	(0.667,1,1.5)	(0.4,0.5,0.667)	(0.4,0.5,0.667)	(1,1,1)

The weight vector from this table is calculated as $W_{BP} = (0.41,0.45,0.10,0.03)^T$

Table 3(b): Pair wise comparison matrix of sub factors with respect to Strategic

	Manpower Mgt	Network Plan & Enhancement	Audit & control	Data Confidentiality	Innovation & customized sol
Manpower Mgt	(1,1,1)	(1,1,1)	(0.667,1,1.5)	(0.667,1,1.5)	(2.5,3,3.5)
Network Plan & Enhancement	(1,1,1)	(1,1,1)	(1.5,2,2.5)	(1.5,2,2.5)	(1.5,2,2.5)
Audit & control	(0.667,1,1.5)	(0.4,0.5,0.667)	(1,1,1)	(0.667,1,1.5)	(1.5,2,2.5)
Data Confidentiality	(0.667,1,1.5)	(0.667,1,1.5)	(0.667,1,1.5)	(1,1,1)	(0.667,1,1.5)
Innovation & customized sol	(0.286,0.334,0.4)	(0.4,0.5,0.667)	(0.4,0.5,0.667)	(0.667,1,1.5)	(1,1,1)

The weight vector from this table is calculated as $Ws = (0.28,0.31,0.23,0.18,0.01)^T$

Table 3©: Pair wise comparison matrix of sub factors with respect to Operational

	Timely Delivery	Safe Shipments	Resource Optimization	Effective Route Planning	Inventory Replenishment
Timely Delivery	(1,1,1)	(1,1,1)	(1.5,2,2.5)	(0.667,1,1.5)	(2.5,3,3.5)
Safe Shipments	(1,1,1)	(1,1,1)	(3.5,4,4.5)	(1.5,2,2.5)	(3.5,4,4.5)
Resource Optimization	(0.4,0.5,0.667)	(0.223,0.25,0.286)	(1,1,1)	(3.5,4,4.5)	(0.667,1,1.5)
Effective Route Planning	(0.667,1,1.5)	(0.4,0.5,0.667)	(0.223,0.25,0.286)	(1,1,1)	(3.5,4,4.5)
Inventory Replenishment	(0.286,0.334,0,4)	(0.223,0.25,0.286)	(0.667,1,1.5)	(0.223,0.25,0.286)	(1,1,1)

The weight vector from this table is calculated as $W_O = (0.28,0.44,0.26,0.02,0)^T$

Table 3(d): Pair wise comparison matrix of sub factors with respect to Technical

	Use of WMS Software	Data handling & extraction	Tracking & tracing	Use of Internet & EDI	Bar-coding & RFID systems
Use of WMS Software	(1,1,1)	(0.667,1,1.5)	(1.5,2,2.5)	(0.667,1,1.5)	(1.5,2,2.5)
Data handling & extraction	(0.667,1,1.5)	(1,1,1)	(0.667,1,1.5)	(2.5,3,3.5)	(1,1,1)
Tracking & tracing	(0.4,0.5,0.667)	(0.667,1,1.5)	(1,1,1)	(0.667,1,1.5)	(2.5,3,3.5)
Use of Internet & EDI	(0.667,1,1.5)	(0.286,0.334,0.4)	(0.667,1,1.5)	(1,1,1)	(3.5,4,4.5)
Bar-coding & RFID systems	(0.4,0.5,0.667)	(1,1,1)	(0.286,0.334,0.4	(0.224,0.25,0.286)	(1,1,1)

The weight vector from this table is calculated as $W_T = (0.26,0.25,0.22,0.27,0)^T$

Table 3(e): Pair wise comparison matrix of sub factors with respect to Societal

	Use of eco-friendly fleet	Use of renewable energy resources	Use of reusable and recyclable packaging	Reduction in carbon emission	Initiatives towards CSR
Use of eco-friendly fleet	(1,1,1)	(2.5,3,3.5)	(1,1,1)	(3.5,4,4.5)	(0.286, 0.34,0.4)
Use of renewable energy resources	(0.286, 0.34,0.4)	(1,1,1)	(1,1,1)	(3.5,4,4.5)	(0.4,0.5,0.667)
Use of reusable					

and recyclable packaging	(1,1,1)	(1,1,1)	(1,1,1)	(3.5,4,4.5)	(0.4,0.5,0.667)
Reduction in carbon emission	(0.223, 0.25,0.286)	(0.223,0.25,0.286)	(0.223,0.25, 0.286)	(1,1,1)	(0.286, 0.34,0.4)
Initiatives towards CSR	(2.5,3,3.5)	(1.5,2,2.5)	(1.5,2,2.5)	(2.5,3,3.5)	(1,1,1)

The weight vector from this table is calculated as $W_{C4} = (0.51,0.05,0.43)^T$

Table 5: Global Weight of the Main and Sub-Factors for Selection of Best 3PL

S.No.	Factors	Individual wt.	Global wt.
1	**Strategic**	**0.41**	**0.41**
	● Manpower Management	0.28	0.116
	● Network Planning & Enhancement	0.31	0.127
	● Audit & Control	0.23	0.095
	● Data Confidentiality	0.18	0.072
	● Innovation & Customized Solutions	0.01	0.005
	Operational	**0.45**	**0.45**
	● Timely Delivery	0.28	0.125
	● Safe Shipments	0.44	0.202
	● Resource Optimization	0.26	0.116
	● Effective Route Planning	0.02	0.011
	● Inventory Replenishment	0.00	0.00
3	**Technical**	**0.10**	**0.10**
	● Use of WMS Software	0.26	0.027
	● Data handling and Extraction	0.25	0.026
	● Tracking & tracing of shipments	0.22	0.023
	● Use of Internet & EDI	0.27	0.028
	● Bar-coding & RFID Systems	0.00	0.00
4	**Societal**	**0.03**	**0.13**
	● Use of eco-friendly fleet	0.44	0.014
	● Use of renewable energy resources	0.06	0.002
	● Use of reusable and recyclable packaging	0.07	0.002
	● Initiatives towards CSR	0.00	0.000

Results show that priority weight differs for all criteria. Based on priority weights, different categories can be ranked in descending order as Operational (0.45), Strategic (0.41), Technical (0.10) and Societal (0.03). The most important best practices are followed under operational category. Under operations category, safe shipments (0.44) and timely delivery (0.28) are two important sub factors that are basically inbuilt operational practices required to serve customers. Resource Optimization (0.26) is also an important concern area where LSPs try to optimize their limited resources. After operational, second priority should be given to Strategic. At strategic level, the major sub factor is Network Planning and Enhancement with priority weight of 0.31 followed by manpower management (0.28) and audit and control (0.23) as shown in Table 4. In today's market conditions deviating from traditional to digital, logistics service providers are extensively working towards the enhancement of network from domestic to global and simultaneously, emphasizing on manpower management to train them as per increasing market requirements. The weight for data confidentiality is 0.18 which shows that top management gives high importance to the security and safety of customer's data. Innovation and customized solutions (0.005) has less weightage as compared as to other sub factors. It reflects that LSPs give little importance to innovation rather than serving customers in usual way.

In Technical, Use of Internet and EDI (0.27) and use of WMS (0.26) are the two important sub factors required for smooth communication between different supply chain partners. Common software's like Electronic Data Interchange (EDI) and Warehouse Management software (WMS) brings transparency and reduces inventory integration in entire supply chain. These findings have emphasized on the increasing importance of communication by logistics providers to remain competitive in dynamic market conditions. Also, in order to serve across boundaries specifically in era of e-commerce, competency of logistics provider can act as a competitive advantage to the firm. Data handling and extraction (0.25) followed by tracking and tracing of shipments (0.22) are also required sub factors of technical category. It helps in providing all essential information related to data and exact positioning of the shipments to the customers.

Societal is the fourth important category. In this category, use of eco friendly fleet (0.44) and reduction in carbon emission (0.44) are perceived to be most important sub factor of Societal, followed by use of reusable and recyclable packaging (0.07) and use of renewable energy sources (0.06). These results clearly show that LSPs have started contributing towards society but not at very large scale. LSPs are adopting best practices to serve customers in best possible manner but still in learning phase.

Concluding Remarks and Implications of the Study

Logistics service providers are contributing hugely in successful execution of all processes of organizations. At the same time, they are also trying to give best of their services to fulfill their customer expectations. The best practices followed by Indian logistics service providers are categorized into strategic, operational, technical and societal on the basis of literature review and expert opinion. Further, twenty best practices were identified as sub- categories under above defined categories. The experts rated these sub factors on the basis of their importance and further prioritized by using Fuzzy AHP methodology. Operational (0.45), Strategic (0.41), Technical (0.10) and Societal (0.03) are the ranking of main categories. Safe shipments are the most important obvious best practice that is needed to be strictly followed by LSPs. Although LSPs focus comparatively less to society but still use of eco-friendly fleet is also considered as one of the important best practice followed by LSPs. The importance of network planning an enhancement reflects the need of increase in existing distribution network and to serve more customers. Timely delivery and manpower management are two prioritized best practices where LSPs need to give more emphasis to be more successful. Delivering shipments on time and

managing manpower to deliver best of the services are vital requirements of LSPs in order to make customer satisfied.

Innovations and customized solutions, effective route planning, inventory replenishment, bar coding and initiatives towards CSR activities are still in infancy stage. Large logistics players have initiated these practices but small players are in planning state and if implemented, not at very big scale. These best practices can further be implemented and brings improvement in services of LSPs. The study will enable the organizations to understand the capabilities and practices used by Indian LSPs in order to provide better service quality and timely delivery of their committed shipments. The research will also help unorganized and budding LSPs to identify the factors on which they can work to improve and excel to fulfill the dynamic market needs.

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BIG DATA: Transforming Governance for Enhanced Citizen Participation

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Abstract

There have been changing paradigms for science, technology and management affecting the way we live and the way we are getting governed. India being the largest democracy in the world and the second most populous country in the world has much to gain from e-governance. There is plethora of data generated at an exorbitant speed with disparate sources from multitude of stakeholders.There are existing studies for measuring the e-governance projects in terms of outcomes like reduced costs, speed of delivery, performance effectiveness of implementation, etc. or others parameters measuring the performance directly in terms of transparency, accountability and citizen participation. But there is dearth of empirical studies to measure the influence of using big data on the performance of e-governance projects. But before we try to see the influence of using big data it is important to explore the variables affecting the performance of e-governance projects using big data. This study explores these variable based on Situation-Actor-Process (S-A-P) framework. Further, the SAP-LAP framework is used for developing the conceptual model of inquiry that will exhibit the systemic flexibility for e-governance performance measurement.

The analysis revealed that the e-governance projects using big data with high value of conceptualized S-A-P variables are characterized by high performance. This implies that conceptualized S-A-P variables for big data do influence the performance of e-governance projects. Also the citizen empowerment is enhanced through citizen participation.The study is based on the pilot study in the context of G2C e-governance projects in CGHS. It is required to study more such e-governance projects making use of big data so as to validate and generalize the proposed framework. Also though GCHS does have huge set of data but it is still not being analyzed to the fullest to support citizen centric services.The analysis results may be relevant to the policy makers or practitioners for e-governance projects to improve the performance of implementation of these projects. This may be further compared with similar projects in healthcare like DGEHS run by Delhi government.

Keywords: SAP-LAP, e-government, e-governance, big data, government transformation, innovative government, performance of e-governance projects.

Introduction

Government is a dynamic mixture of goals, structure and functions (Pardo, 2000). E-Governance, an idea by former US Vice President Al Gore, to link the citizen to various government agencies for getting all kinds of services in an automated manner by use of ICT, reduces cost, improves performance, speed of delivery and effectiveness of implementation (Almaraben and Abu Ali,

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2010). E-Governance transforms governance to a transparent, responsive, citizen friendly and efficient regime. E-Governance has emerged as one of the innovative ways of providing information and delivering services to citizens. It is providing governments with new opportunities of bringing services closer to the citizen in cost-effective, efficient and transparent ways. Considering the diversity of India, it has become a necessity to implement e-governance to realise the dream of Digital India. But the effective e-governance implementation requires a lot more than just utilizing the latest means of ICT. There is little research that has been conducted in the context of developing countries to benchmark and appraise the impact of e-government on the target groups. Assessment of impact is important to justify public fund expenditure and inform future projects. Most studies on assessment of e-government have been done in developed countries where the context is different from that of developing countries. Therefore, there is need to develop frameworks that are suitable in the context of developing countries. Studies on assessing impact have been done at macro and micro levels. These studies are largely based on supply-side and a few on demand-sides with little focus on outcomes and impact.

One of the outcomes of effective e-governance is to empower the citizens by meeting all the critical success factors (CSFs) and improvise the services by analyzing their transactional data. But there is huge set of citizen transactional data that is getting generated on daily basis through magnitude of services provided by government departments in India. It is therefore imperative to make use of big data for effective e-governance. Big data analytics has the potential to change the paradigms of governance. Despite these deep impacts on strategy and operations, there is paucity of empirical research to assess the role of big data in e-governance (Wamba et al., 2015). There is hardly any empirical study for success factors in India in the context of big data and e-governance. The models described in literature review are without a base of the data in e-governance. This study aims at developing a conceptual framework for assessing the performance of the e-governance projects by using big data. The conceptualized model will integrate the benefits of big data after taking due care of the challenges posed by big data.

Once the use of big data for e-governance becomes popular, the next set of challenges will be to measure the impact of adoption by devising the Key Performance Indicators (KPIs). E-Government added transparency, accountability, citizen participation for government performance (Mohammad, 2009) and broadens the participation of citizens in decision-making process. These may be the starting KPIs. The purpose of this study is to measure the performance of e-governance projects considering the conceptualized variables based on Situation-Actor-Process (S-A-P) - Learning-Action-Performance (L-A-P) framework (Sushil, 2000) which may be influencing the performance of e-governance projects. The objectives of this study are:

- To develop a conceptual research framework for assessing the performance of G2C e-governance projects using big data
- To explore the likely influence of the conceptualized research variables on performance of e-governance projects (with special case of CGHS e-governance project)

The structure of the paper has an introduction on the subject area followed by the literature review about e-governance, big data and how to assess the performance of e-governance projects. This is followed by the methodology, the conceptual framework for assessing the performance of e-governance projects, description of the selected project into consideration and then how the questionnaire was developed and data was collected. Last section presents the analysis. Finally the research findings and conclusions are presented.

Literature Review

E-Governance

E-Government refers to the use by government agencies of information technologies (IT) to transform relations with citizens, businesses and other arms of government (World Bank, 2009). The term e-government is not uniformly used across the globe. Different terms are used by different countries as per their varying contexts (Verdegem and Verleye, 2009). According to Sheridan and Riley (2006), e-governance is a broader concept that deals with the whole spectrum of the relationship and networks within government regarding the usage and application of ICTs whereas e-government is limited to the development of online services). According to them, e-government is an institutional approach to jurisdictional political operations where as e-governance is a procedural approach to co-operative administrative relations, i.e. the encompassing of basic and standard procedures within the confines of public administration. However, e-governance has been used more frequently throughout this paper keeping in view the Indian context (Planning Commission, 2007).

E-Governance can renovate the relationship between public, private sector and government and enable better policy outcomes, high quality services and greater engagements with the citizens of the country. It has been seen that the government departments work in silos and are not integrated to provide single line of service to the citizens. If the departments are virtually integrated through the service providers then that can be an effective model for delivering citizen centric e-governance solutions (Al-Khouri et al., 2011; Kietzmann et al., 2011). Implementing e-government is a continuing process and most often the development is conceptualized in stages. E-Governance is in essence the application of Information and Communications Technology (ICT) to government functioning in order to create 'Simple, Moral, Accountable, Responsive and Transparent (SMART)' governance (ARC, 2008). The goals of e-Governance are: better service delivery to citizens, transparency and accountability to citizens, empowering citizens through information, improved efficiency within governments and improve interface with business and industry.

Big Data

Big data has been defined in terms of 3Vs as 'Volume' or the large amount of data consuming either huge storage or has large number of records data; 'Velocity', which is the frequency or the speed of data generation or data delivery; and 'Variety', meaning data being generated from a large variety of sources and formats, contain multidimensional data fields including structured and unstructured data (Russom, 2011). Later on 'Value' was added to stress the importance of extracting economic benefits from available big data (IDC, 2012; Oracle, 2012) and 'Veracity' to highlight the importance of data quality and level of trust in various data sources (Forrester, 2012; White, 2012). The values created by big data are multifold (Wamba et al., 2015) like creating transparency, enable need discovery, enable performance improvement, better customization on population segments, data driven decisions, new business models, new products, new services, etc. Big data has multitude of benefits highlighted by various authors. Big data has high operational and strategic potential in generating extensive 'business value' (Wamba et al., 2015). 'Big data' has been defined as "next big thing in innovation" (Gobble, 2013), "fourth paradigm of science" (Strawn, 2012), "next management revolution" (McAffee and Brynjolfsson, 2012) and facilitator for bringing revolution in "science and technology" (Ann Keller et al., 2012). This is possible because 'big data' has the capability of changing the competition by process transformation, alteration of corporate ecosystems and facilitating innovation (Brown et al., 2011) and also create business value by unearthing new organizational capabilities (Davenport et al., 2012). On the other hand, there are issues as well related to use of big data

(Wamba et al., 2015) like data policies, technology & techniques, department change (organizational change) and talent, access to data, industry structure, etc. Big data includes extremely large data sets that may be analysed computationally to reveal patterns, trends, and associations, especially relating to human behaviour and interactions.

There are different set of models to gauge the maturity level of e-governance. In a country like India, with so much of diversity, it is difficult to attain the global standards of good governance like outlined by UN. Need for the use of data to track the minute level of each and every citizen transaction is there so as to analyse it and improve on continuous basis from the feedback (ARC, 2008). To realize these maturity models either for vertical and horizontal integration or transformation, the use of big data is required.

Performance Measures of E-Governance Using Big Data

E-government initiatives are aimed at raising the level of government performance in general by upgrading the level of government services provided to citizens and enhance the effectiveness of government work internally. This also broadens the participation of citizens in decision-making process (Almaraben and AbuAli, 2010). Different set of indicators for measuring/assessing the performance of e-governance projects are used by different researchers. Indicators for measuring are e-government success are information dissemination, two-way communication, services delivered, integration, political participation, security, usability, etc. (Holzer, 2008). E-Government is also modeled as a value chain showing the way inputs are converted into outputs (Heeks, 2006). Using big data in e-governance can be a challenging task and may have different set of requirements. Zoughbi, Saleem (2017) defines the infrastructure requirements for e-governance using big as follows:

- High volume of data that should be supported for long time
- Generation of huge amount of data at high speed
- Distribution and replication of multi-dimensional data
- Support of virtual e-governance communities
- Good security environment for data storage and data retrieval
- Data integrity, data confidentiality and data accountability

Every e-government application requires effective processes technology and data for successful implementation (Dhoot, 2014). But the use of big data in e-governance requires data sharing, learning from data, grouping, mining, etc. The big data framework for e-governance requires the following:

- Resource management
- Data management
- Data Analysis and Data Discovery
- Dynamic Reporting

There are lots of challenges involved like scaling data, auditing, replication, disaster recovery, performance, etc. But for big data has to be used in e-governance there are following requirements:

- E-governance needs big data to be reliable, fast and efficient.
- Faster and efficient policies
- Data efficiency

- Current implementation moving from handling structured data and no sharing between applications

There are inherent differences in traditional e-government and big data e-government as listed in table below (Rajagopalan and Solaimurugan, 2013).

Table 1: Comparison between traditional and big data e-governance

Parameters	Traditional E-Government	Big data E-Government
Architecture	Centralized	Distributed
Data	Structured data	Raw, unstructured and semi-structured
Analytics	• Statistical analytics with known condition • Traditional analytics based on the relation data model and known relationship	• Discovery of unexplored business questions • Unstructured data (images, videos, mobile generated, RFID, etc.) requires specialized algorithms and software
Data size	Tera bytes	Large and messy data
Type of analysis	Text analytics	Graph, audio and video analytics
Data model	Fixed schema	Schema less
Applications	Batch oriented and one need to wait transformation jobs to complete before the required insight is obtained	Big data analytics is aimed at near real time analysis of the data using the support of required software
Types of operation	Relational and conditional	Analytics: Sentimenta l, predictive, behavioural, Machine Learning
Reporting	Ad-hoc query report, high latency for large volume of data	Low latency, interactive, visualization, decision-making and analytics reports

(**Source:** Rajagopalan and Solaimurugan, 2013)

Performance of e-governance projects is measured in terms of transparency, accountability and citizen participation that include interactivity, decision-making or support and empowerment. The study will attempt to show how this is enhanced by use of big data. There are similar set of indicators for measuring the success of big data projects. Based on these a set of conceptualized variables are compiled as in table below to measure the performance of e-governance projects making use of big data.

Methodology

Literature review was conducted for understanding the indicators for measuring the performance of e-governance projects with or without use of big data. There were very few studies on assessing the use of big data in e-governance projects. Macro variables influencing the performance of e-governance projects using big data were identified through review of literature. Experts from the domain were interviewed for further inputs. Macro variables expected to influence the performance of e-governance projects were compiled and categories on basis of situation, actors and processes. SAP-LAP framework (Sushil, 2000) has been used as every managerial inquiry can be modelled using this framework. Though SAP-LAP is a generic management framework but it has been used for analyzing, planning, implementing gaps in e-governance projects (Suri and Sushil, 2017), technology management (Garg and Deshmukh, 2010), etc. A questionnaire was designed and survey conducted to measure the performance of e-governance projects and S-A-P variables in the context of selected project of CGHS under Ministry of Health and Family Welfare (MOHFW). The questionnaire was given to around 56 respondents but was completed by 47 respondents. Survey data have been analyzed to study the influence of S-A-P variables on performance of e-governance projects using big data.

Table 2: Conceptualized variables to measure performance of e-governance projects

Macro variables	Micro variables	Literature review
Transparent Systems (TS)	Sharing: Policies, processes, expenses, agreements, tenders, data and relevant information	Harrison et al. (2011), DeitY (2008)
	Current information (quality)	DeitY (2008), Suri and Sushil (2011)
	No ambiguity	DeitY (2008), Suri and Sushil (2011)
	Easily accessible data from anywhere	DeitY (2008)
	Reduced corruption (online and no middlemen)	DeitY (2008)
	Enhanced Trust	Kearns (2004), DeitY (2008)
Accountable Government (AG)	System Availability	DeitY (2008)
	Accessibility: Easy access to services	DeitY (2008)
	Objectives framed as per the needs	DeitY (2008)
	Met stated objectives	DeitY (2008)
	Reduced poverty	DeitY (2008)
	Increased response	DeitY (2008)
	Safeguard interests	DeitY (2008)
	Effective	DeitY (2008)
	Efficient • Accuracy • Reliability • Minimal data loss • Speed of delivery/faster • Speed of response to queries • Improved service quality/performance • Cost reduction (doctor, medicines, travel, etc.) • Reduced proportion of cost to citizen (subsidy)	Almarabeh et al. (2010), DeitY (2008), Suri and Sushil (2006), Suri and Suhsil (2011), Suri (2014)
Enhanced Citizen Participation (ECP)	Enhanced Interactivity	Napitupulu et al. (2014), DeitY (2008)
	Data Driven (based) Decision making	Napitupulu et al. (2014), DeitY (2008)
	Citizen Empowerment	Napitupulu et al. (2014), DeitY (2008)
	Participation in government processes and major decisions	Napitupulu et al. (2014), DeitY (2008)
	Increased number of transactions executed electronically	Napitupulu et al. (2014), DeitY (2008)
	Provision for submission of proposals on government plans	Napitupulu et al. (2014), DeitY (2008)
	Free and open dialogues with government through various online platforms	Napitupulu et al. (2014), DeitY (2008)

Conceptualized variables

In context of e-governance projects it is imperative for citizens to visit the service centre to avail the services. So government institution providing service can be viewed as a management context where a citizen visiting would face situations like taking an appointment, queuing for the turn, visits the doctor. The citizen interacts with employees called actors involved at the service centre like doctors, pharmacists and support staff who are providing the services by using a set of processes like medicine indent and distribution, etc. Therefore, citizens develop a perception about the performance of the e-governance projects based on the interplay of situation, actors and processes variables. The review of literature facilitated to draw a conceptualized model showing the set of major variables affecting the performance of e-governance projects using big data (William et al., 2010).

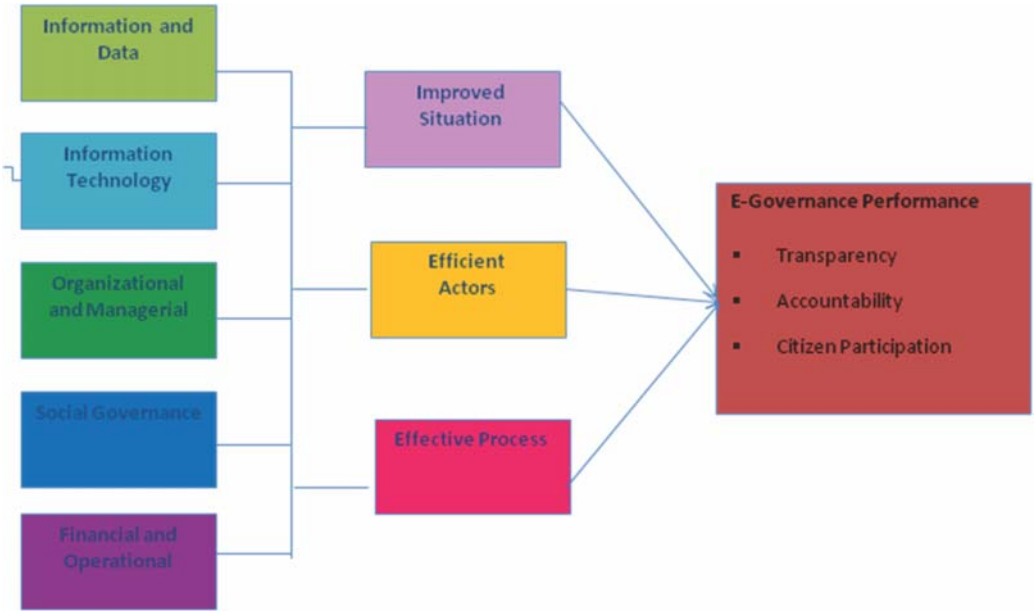


Figure 1: Conceptual Model showing the set of variables affecting performance of e-governance projects

Project Description

Central Government Health Scheme (CGHS)

The "Central Government Health Scheme" (CGHS) provides comprehensive health care facilities for the Central Govt. employees and pensioners and their dependents residing in CGHS covered cities. Started in New Delhi in 1954, Central Govt. Health Scheme is now in operation in Allahabad, Ahemdabad, Bangalore, Bhubhaneshwar, Bhopal, Chandigarh, Chennai, Delhi, Dehradun, Guwahati, Hyderabad, Jaipur, Jabalpur, Kanpur, Kolkatta, Lucknow, Meerut, Mumbai, Nagpur, Patna, Pune, Ranchi, Shillong, Trivandrum and Jammu. The Central Govt. Health Scheme provides comprehensive health care to the CGHS Beneficiaries in India. The medical facilities are provided through Wellness Centres (previously referred to as CGHS Dispensaries) /polyclinics under Allopathic, Ayurveda, Yoga, Unani, Sidha and Homeopathic systems of medicines. CGHS e-governance project was a Mission Mode Project (MMP) under the National E-Governance Plan (NEGP) of the Government. The portal was launched in November, 2005.

The main components of the Scheme are:

- The dispensary services including domiciliary care
- Family Welfare (FW) & Mother Child Health (MCH) Services
- Specialist consultation facilities both at dispensary, polyclinic and hospital level including X-Ray, ECG and Laboratory Examinations.
- Hospitalization.
- Organization for the purchase, storage, distribution and supply of medicines and other requirements
- Health Education to beneficiaries

Table 3: CSFs affecting performance of e-governance projects using big data

Macro variable	Micro variables	Studies
Information and Data (ID)	Accuracy	Napitupulu et al. (2014)
	Consistency	Napitupulu et al. (2014)
	Completeness	Napitupulu et al. (2014)
	Appropriateness	Napitupulu et al. (2014)
Information Technology (IT)	Infrastructure	Almarabeh et al. (2010), Dada (2006)
	Accessibility	Almarabeh et al. (2010)
	Availability	Almarabeh et al. (2010), Napitupulu et al. (2014)
	Privacy and Security	Almarabeh et al. (2010), Smith et al. (2006), Napitupulu et al. (2014)
	Usability	Almarabeh et al. (2010), Napitupulu et al. (2014)
	Interoperability	Almarabeh et al. (2010), Smith et al. (2006)
	Training/capacity building	Almarabeh et al. (2010), Dada (2006), Napitupulu et al. (2014)
	Information, system and service quality	Almarabeh et al. (2010), Napitupulu et al. (2014)
Organizational and Managerial (OM)	Management/government support	Napitupulu et al. (2014)
	Strong Leadership	Napitupulu et al. (2014)
	Clear vision, objectives, targets and outcomes	Sukyoung et al. (2008)
	Skilled resources	Sukyoung et al. (2008)
	Project planning and management	Napitupulu et al. (2014), Ziemba et al. (2013)
	BPR	Sukyoung et al. (2008)
	Training to resources	Almarabeh et al. (2010)
Social/Governance (SG)	Political will and support	Almarabeh et al. (2010)
	Budget allocation and disbursement	Napitupulu et al. (2014), Ziemba et al. (2013)
	Accountability	Napitupulu et al. (2014)
	Transparency	Napitupulu et al. (2014)
	Capacity building	Almarabeh et al. (2010)
	Coordination between government agencies	Napitupulu et al. (2014), Ziemba et al. (2013)
	Monitoring and time bound deliverables	Napitupulu et al. (2014), Ziemba et al. (2013)
	Flexible Policy/legal frameworks	Napitupulu et al. (2014)
Financial and Operational (FO)	Project Mode: PPP	Almarabeh et al. (2010), Ziemba et al. (2013)
	Standardization and benchmarking	Ziemba et al. (2013)
	Cost structures and budgeting	Almarabeh et al. (2010), Ziemba et al. (2013)
	Reduction in duplicate tasks	Napitupulu et al. (2014)
	Reduced dependencies on multiple departments	Dada (2006), Ziemba et al. (2013)
	Efficiency	Napitupulu et al. (2014)

Table 4: Mapping of conceptualized macro and micro variables with literature

Macro variables	Micro variables (Mapping with CSFs in Table III)	Studies
Improved Situation (IS)	WC: Central location and transport connectivity (FO)	Vellakkal et al, (2012)
	WC: Distance from home (FO)	Vellakkal et al, (2012)
	Number of trips made for the service (FO)	DeitY
	Proper/comfortable sitting arrangement (OM)	Vellakkal et al, (2012)
	Cleanliness of centre and washrooms (OM)	Vellakkal et al, (2012)
	Availability of safe drinking water (OM)	Vellakkal et al, (2012), DeitY (2008)
	Grievances Redressal (OM)	Vellakkal et al, (2012)
	Overcrowding of space with patients (SG)	Vellakkal et al, (2012)
	Time to take appointment (FO)	Vellakkal et al, (2012)
	Average waiting time to meet service provider (OM)	Vellakkal et al, (2012), DeitY (2008)
	Availability of medicines in stores (SG)	Vellakkal et al, (2012), DeitY (2008)
	Online facility to check Medical and medicine history (ID)	Vellakkal et al, (2012), DeitY (2008)
	SMS with name of concerned doctor, token number and estimated time for turn (ID)	Vellakkal et al, (2012), DeitY (2008)
Efficient Actors* (EA)	Availability of service providers: Attendance, punctuality and continuous presence during service hours (OM) • Doctors • Pharmacists • Support staff	Vellakkal et al, (2012)
	Competence of service providers (OM)	Vellakkal et al, (2012)
	Knowledge level of service providers (OM)	Vellakkal et al, (2012)
	Faster response because of online systems (OM)	Suri (2014)
	Behaviour: Doctors attentive and sympathetic (OM)	Vellakkal et al, (2012)
	Communication skills (OM)	Vellakkal et al, (2012)
Effective Process (EP)	Flexibility in process of taking appointment (FO)	Lovelock (1983)
	Provision for laboratory services (SG)	Vellakkal et al, (2012)
	Provision for uninterrupted services in case of technical fault (IT)	Lovelock (1983), DeitY (2008), Suri (2014)
	Provision to change rooms if service provider unavailable (IT + ID)	Vellakkal et al, (2012)
	Flexibility of Indent process (OM)	Vellakkal et al, (2012)
	Availability of prescribed medicines (SG)	Vellakkal et al, (2012)
	Adequate working hours to eliminate overcrowding and faster turns (SG)	Vellakkal et al, (2012)
	Adequate number of doctors and other support staff (SG)	Vellakkal et al, (2012)

* Doctors, pharmacists and support staff

Table 5: Summary of selected e-governance project

Attribute	E-Governance Project: CGHS Description
Objective	To provide comprehensive health care facilities for the Central Govt. employees and pensioners and their dependents residing in CGHS covered cities
Scope	Processes in CGHS dispensaries only
Coverage	All CGHS dispensaries across India, CGHS approved hospitals and laboratories/diagnostic centers
Department	Ministry of Health and Family Welfare
Beneficiaries	Central Govt. employees and pensioners and their dependents
Expected Benefits	Automated medical and family welfare services
Services	• Dispensary services including domiciliary care • Family Welfare & Mother Child Health Services • Specialist consultation facilities both at dispensary, polyclinic and hospital level including X-Ray, ECG and laboratory examinations • Hospitalization • Organization for the purchase, storage, distribution and supply of medicines and other requirements • Health Education to beneficiaries
Status	CGHS portal is online since November, 2005

Questionnaire Development and Data Collection

Questionnaire was designed and developed based on the expert interviews and understanding developed through review of literature. The draft questionnaire was again provided to four experts for their inputs and feedback. Feedback was incorporated before distribution to respondents. The final questionnaire is attached in Appendix 1. The mapping of conceptualized macro and micro variables with the corresponding questions is given in Table below. The questionnaire was given to around 56 respondents but was completed by 47 respondents.

Reliability and validity analysis

The internal consistency of items in a construct is measured using Cronbach alpha. The Cronbach alpha values of constructs, i.e. performance of e-governance projects and S-A-P variables were found to be more than 0.85 respectively. The values above 0.6 are considered acceptable for this kind of empirical research (Hair et al., 2006; George and Mallery, 2011)

Analysis and Discussion

The descriptive statistics in Table VII below show the values of range, mean and standard error of the study variables. The relatively higher values of observed mean for transparent systems (TS) and ECP (Enhanced Citizen Participation) may indicate their higher significance. This may be because of the use of big data in e-governance project that may have influenced the performance of the e-governance project. The standard error associated with all the macro variables being negligible.

Table 6: Mapping of conceptualized research variables with questions in Questionnaire

Macro variable	Micro variables	Questions
TS	Sharing: Policies, processes, expenses, agreements, tenders, data and relevant information	TS1
	Current information	TS2
	No ambiguity	TS3
	Easily accessible data from anywhere	TS4
	Reduced corruption (online and no middlemen)	TS5
	Enhanced Trust	TS6
AG	System Availability	AG1
	Accessibility: Easy access to services	AG2
	Objectives framed as per the needs	AG3
	Met stated objectives	AG4
	Reduced poverty	AG5
	Increased response	AG6
	Safeguard interests	AG7
	Effective	AG8
	Efficient	
	Accuracy	AG9
	Reliability	AG10
	Minimal data loss	AG11
	Speed of delivery/faster	AG12
	Speed of response to queries	AG13
	Improved service quality/performance	AG14
	Cost reduction (doctor, medicines, travel, etc.)	AG15
	Reduced proportion of cost to citizen (subsidy)	AG16
ECP	Enhanced Interactivity	ECP1
	Data Driven (based) Decision making	ECP2
	Citizen Empowerment	ECP3
	Participation in government processes and major decisions	ECP4
	Increased number of transactions executed electronically	ECP5
	Provision for submission of proposals on government plans	ECP6
	Free and open dialogues with government through various online platforms	ECP7
IS	WC: Central location and transport connectivity	IS1
	WC: Distance from home	IS2
	Number of trips made for the service	IS3
	Proper/comfortable sitting arrangement	IS4
	Cleanliness of centre and washrooms	IS5
	Availability of safe drinking water	IS6
	Grievances Redressal	IS7
	Overcrowding of space with patients	IS8
	Time to take appointment	IS9
	Average waiting time to meet service provider	IS10
	Availability of medicines in stores	IS11
	Online facility to check Medical and medicine history	IS12
	SMS with name of concerned doctor, token number and estimated time for turn	IS13
EA	Availability of service providers: Attendance, punctuality and continuous presence during service hours	EA1
	• Doctors	EA2
	• Pharmacists	EA3
	• Support staff	EA4
	Competence of service providers	EA5
	Knowledge level of service providers	EA6
	Faster response because of online systems	EA7
	Behaviour: Doctors attentive and sympathetic	EA8
	Communication skills	EA9
EP	Flexibility in process of taking appointment	EP1
	Provision for laboratory services	EP2
	Provision for uninterrupted services in case of technical fault	Ep3
	Provision to change rooms if service provider unavailable	EP4
	Flexibility of Indent processEP5	EP5
	Availability of prescribed medicinesEP6	EP6
	Adequate working hours to eliminate overcrowding and faster turnsEP7	EP7
	Adequate number of doctors and other support staffEp8	EP8

Table 7: Observed Mean values of macro variables for CGHS e-governance project

	N	Range	Minimum	Maximum	Sum	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	d. Error	Statistic	Statistic
TS	47	.53	2.77	3.30	18.15	3.0250	.08397	.20569	.042
AG	47	1.83	1.36	3.19	42.62	2.6636	.10900	.43599	.190
ECP	47	.47	2.79	3.26	21.16	3.0229	.06361	.16830	.028
IS	47	1.47	1.85	3.32	31.70	2.4385	.11233	.40503	.164
EA	47	.64	2.55	3.19	26.36	2.9289	.07852	.23555	.055
EP	47	.66	2.13	2.79	19.51	2.4387	.09001	.25458	.065
Valid N	47								

Research findings and conclusion

Research findings

The study proposed a S-A-P based framework for assessing the performance of a citizen centric e-governance project. Based on SAP-LAP framework (Sushil, 2000) the research proposed the S-A-P variables that may influence the performance of e-governance projects measured in terms of conceptualized variables Transparent Systems (TS), Accountable Government (AG) and Enhanced Citizen Participation (ECP). One citizen centric e-governance project on CGHS (Mission Mode Project as part of National E-Governance Plan) was selected to conduct the pilot study. A survey of respondents was conducted to measure the performance of CGHS project and influencing S-A-P variables. As per the univariate analysis performed the performance of e-governance projects and the associated S-A-P variables are expected to have a positive relationship. As per the results of the pilot study, CGHS has high value of performance as well as S-A-P variables. This reflects that we need to have a citizen centric approach in G2C e-governance projects for better performance. The pilot study suggests that it may be possible that S-A-P variables may be influencing the performance of the G2C e-governance projects. Therefore, we propose the following research hypotheses to be tested further on detailed study of few more e-governance projects for validating the proposed research framework:

- HA1: An Improved Situation (IS) influences the performance of e-governance projects
- HA2: Efficient Actors (EA) influences the performance of e-governance projects
- HA3: Effective Processes (EP) during the project implementation influences the performance of e-governance projects

Research Implications (practice, research and society)

The study may have applicable in citizen centric e-governance implementations like Delhi Government Employee Health Services (DGEHS), passport seva project (PSP), Aadhaar project from Unique Identification Authority of India (UIDAI).

Limitations

This study is based on a pilot study in context of one citizen centric e-governance project. It is required to study more such projects for the purpose of validating the proposed framework to make generic framework.

Conclusion

Benefits of e-governance projects are realized by countries across the world. But there are very few e-governance projects across the world which are making use of big data. Whether the e-governance uses big data or not the challenge is that the anticipated benefits by the policy maker and implementers do not reach the end user or beneficiary called citizen. It is therefore important for the government institutes to assess the performance of e-governance initiatives, enhance it using big data and identify the variables that influence the performance after implementation using big data. Few outcomes of the study are as follows:

- It attempted to address the research gap in literature in terms of identifying the S-A-P variables that may be expected to influence the performance of e-governance projects using big data. A conceptual framework has been developed for further validation
- A pilot study was conducted on selected citizen centric e-governance project, CGHS that facilitated the development of probable relationship between the S-A-P and e-governance performance variables in context of using big data that is still completely analyzed leaving a lot of scope for enhancing the performance
- We attempted to frame research hypotheses which may further be tested on a big scale on different set of e-governance projects to validate the conceptual framework and relationship. It is very important to en cash the complete potential of big data specially in healthcare sector in India
- Performance of e-governance projects can be enhanced by using big data that will further enhance the citizen empowerment through citizen participation. Further investigation is required to see the influence of using big data on citizen participation. This study may be used in some other sectors that require the service orientation and use of big data to enhance the performance like national healthcare portal for tracking family welfare records and mother child tracking, etc.

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Appendix 1: Questionnaire

Please tick () on the scale below to express your opinion about CGHS: 0 = Nil, 1= Small extent, 2 = Medium extent, 3= Large extent, 4 = Very large extent						
		0	**1**	**2**	**3**	**4**
	In your opinion, the extent to which there is:					
TS1	Sharing: Policies, processes, expenses, agreements, tenders, data and relevant information					
TS2	Current information					
TS3	No ambiguity					
TS4	Easily accessible data from anywhere					
TS5	Reduced corruption (online and no middlemen)					
TS6	Enhanced Trust					
	In your opinion, the extent to which there is:					
AG1	System Availability					
AG2	Accessibility: Easy access to services					
AG3	Objectives framed as per the needs (affordable basic healthcare for all)					
AG4	Met stated objectives					
AG5	Reduced poverty					
AG6	Increased response					
AG7	Safeguard interests					
AG8	Effective					
	Efficient					
AG9	Accuracy					
AG10	Reliability					
AG11	Minimal data loss					
AG12	Speed of delivery/faster					
AG13	Speed of response to queries					
AG14	Improved service quality/performance					
AG15	Cost reduction (doctor, medicines, travel, etc.)					
AG16	Reduced proportion of cost to citizen (subsidy)					
	In your opinion, the extent to which there is:					
ECP1	Enhanced Interactivity					
ECP2	System helps to use data for medical decisions					
ECP3	Citizen Empowerment					
ECP4	Participation in government CGHS processes and health decisions online					
ECP5	Increased number of transactions executed electronically					
ECP6	Provision for feedback on government plans online					
ECP7	Free and open dialogues with government through various online platforms					
	In your opinion, the extent to which there is:					
IS1	WC: Central location and transport connectivity					
IS2	WC: Distance from home					
IS3	Number of trips made for the service					
IS4	Proper/comfortable sitting arrangement					
IS5	Cleanliness of centre and washrooms					
IS6	Availability of safe drinking water					
IS7	Grievances Redressal					
IS8	Overcrowding of space with patients					
IS9	Time to take appointment					
IS10	Average waiting time to meet service provider					
IS11	Availability of medicines in stores					
IS12	Online facility to check Medical and medicine history					
IS13	SMS with name of concerned doctor, token number and estimated time for turn					

	In your opinion, the extent to which doctors, pharmacists and support staff are efficient and capable in terms of:					
EA1	Availability of service providers: Attendance, punctua lity and continuous presence during service hours					
EA2	• Doctors					
EA3	• Pharmacists					
EA4	• Support staff					
EA5	Competence of service providers					
EA6	Knowledge level of service providers					
EA7	Faster response because of online systems					
EA8	Behaviour: Doctors attentive and sympathetic					
EA9	Communication skills					
	In your opinion, the extent to which there is:					
EP1	Flexibility in process of taking appointment					
EP2	Provision for laboratory services					
EP3	Provision for uninterrupted services in case of technical fault					
EP4	Provision to change rooms if service provider unavailable					
EP5	Flexibility of Indent process					
EP6	Availability of prescribed medicines					
EP7	Adequate working hours to eliminate overcrowding and faster turns					
EP8	Adequate number of doctors and other support staff					

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Process re-engineering model of Dealer E-Assessment- A Digital Transformation for Secure, Assured delivery System Contributing to Green Governance

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Abstract

Department of Commercial Taxes with a vision from VidurNiti: "The King Should collect his taxes without hurting his subjects even as a bee collects honey without harming the flowers" is the highest revenue-earning department with a collection of 51770 Crore in the year 2016-2017, comprising 60% of the total revenue of the State.

A person, who does business in Uttar Pradesh (UP), known as a Dealer, needs to get registered with Department of Commercial Taxes, UP if he is liable to pay taxes as per the legal norms of trading. Auditing and assessment of Registered/Un-registered dealers is the major activity of the department in order to reduce tax evasion and increase state revenue.

E-Assessment (Notices/Orders) system along with Recovery Challan/Certificate (RC) Registers automation, has completed the 360 degree work flow of Assessment Procedure and proves to be very useful as it eliminates the repetitive time consuming task of typing same language for different dealers for issuing them notice or Orders. With complete Assessment system all registers like R3 (RC), R6 (Appeal Cases for RC), R27 (Returned RC), R5A (Notices), and R5B (Orders) get generated automatically for a particular assessment year and RCs are issued with complete information of notice/order with raised additional demand and complete case for a particular dealer is crystal clear and transparent to each of the concerned officer and dealer itself.

Complete MIS has been enabled on E-Assessment for monitoring purpose for Commercial Tax higher authorities. Digitally signed Notices/Orders issued to a dealer are available on dashboard of dealer along with other useful information and applications meant for him. Also dealer is notified about his notices/orders through SMS and email on registered mobile no. and email account of the dealer.

UP has become the first state in the country to have automated online E-Assessment of dealers along with issuance of digitized orders and notices online, increasing the citizen centricity.

Keywords: Dealer Assessment, Dealer Services Portal, Digital Signature, Green Governance, NIC, SDC

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Introduction

The Commercial Tax Department, Uttar Pradesh, Administered the following Acts before GST and now the same applied only to dealers dealing in non-GST commodities.

- The Uttar Pradesh Value Added Tax Act, 2003
- The Uttar Pradesh Sales Tax Act, 1994
- The Central Sales Tax Act , 1956

"The King Should collect his taxes without hurting his subjects even as a bee collects honey without harming the flowers *(Extract from Vidur Niti)*" and to realize this extract from 'Vidur Niti' in reality, VYAS (Varnij Yakar Automation System), an integrated e-Governance solution for Department of Commercial Taxes, Government of Uttar Pradesh, has been developed by the National Informatics Centre, Uttar Pradesh with a vision to provide effective and efficient system of collection of taxes based on progressive use of Information technology and to ensure an environment which is congenial for prospering of Trade and Commerce in the State of Uttar Pradesh.

VYAS has been a successful implementation as a central Web Solution with SQL Server partitioned database for 1349 sector offices in 95 locations under Commercial Tax department, UP since 1st January'2008. For its implementation 'Vyapari Suvidha Kendra' has been constructed at each of 95 locations to facilitate dealers with all trade related services under one roof.

VYAS has got two major categorization of inter-related web applications based on the functioning of the department:

1. Intranet webs on various automated services
    - Office Intranet web VYAS includes
        - ✓ Receipt Acknowledgement,
        - ✓ Hearing,
        - ✓ Survey,
        - ✓ Registration acceptation (TIN (Taxpayer Identity Number)/ SPN (Service Provider Number)/TDN (Tax Deduction Number)
        - ✓ Amendment,
        - ✓ Dealer Transfers,
        - ✓ Suspension,
        - ✓ Restoration,
        - ✓ Cancellation,
        - ✓ Trade related Forms Issuance,
        - ✓ User Management,
        - ✓ Return/Challan Submission,
        - ✓ Enforcement (Panji5-Record of Detention Memo ,Mobile, SIB) Operations and Control System,
        - ✓ E-Assessment (Notices and orders)

The system is being operated in 1349 sector offices at 95 locations in 75 districts of UP via dedicated secure Virtual Private Network (VPN) environment.

2. Online services for around 14 lakh registered Dealers
   - Online services like
     - ✓ e-Return Filing,
     - ✓ e-payment,
     - ✓ e-Forms Downloads,
     - ✓ E-Pargaman,
     - ✓ E-Sancharan,
     - ✓ E-Registration,
     - ✓ E-Amendment,
     - ✓ MIS Reporting System on all automated service,
     - ✓ E-Services Portal for dealers

     are available on Internet 24 x 7 - anytime from anywhere.

DEALER E-ASSESSMENT

A person, who does business in UP, known as a Dealer, needs to get registered with Department of Commercial Taxes, UP if he is liable to pay taxes as per the legal norms of trading.

Auditing and assessment of Registered/Un-registered dealers is the major activity of the department in order to reduce tax evasion and increase state revenue. Assessment of dealers is done on the basis of the returns filed and allied material available on the dealer. Thereafter, demand notice is generated and the same is monitored for compliance. Refund orders are generated case to case basis. The Payments are adjusted against any other demands or payment of refund after adjustment is made.

Dealer Assessment includes marking dealers with annual turnover slab, Return frequency and assessment on the basis of pre-decided parameters. Deemed, Deemed Ousted and pending for decision Assessment and new 7 reason marking based on filed returns by dealer and integration of such cases to r5a (Notice) registers and generation of notices/orders against such cases.

During the process re-engineering of the process of dealer assessment as E-Assessment, various registers R5A Register (for Notices), R5B Register (For Orders) have been computerized. Around 13 notices and 20 orders have been automated and R5A Case Transfer has been implemented so as to incorporate work flow in case dealer gets transferred from one office to another due to annual turnover or business place change.

The complete work flow from notice – order – demand notice – recovery certificate – ST 45 Generation - collection of amount through e-challan by amen – receipt for demanded amount at office counter has been completed and different assessment related registers gets prepared through the system.

Assessment is done on the basis of last 3rd years' filed returns; therefore at present in 2017-2018, the assessment is being carried out on the activities and returns in the year 2014-15 and dealers active in the year 2017-18 will be assessed in the year 2020-21.

Digital Certificate Registration system for departmental officials has been automated for registering their Digital Signature in VYAS for enabling them for facility of digitally signed certificates, notices & orders. Corresponding monitoring MIS has been put n place for speedy registration by officials.

Zone-wise, range-wise, location-wise MIS have been developed on E-Assessment and have been reflected on e-services portal for dealers also so that dealers can view all notices/orders issued to them along with other trade related information. SMS and Email with short description of notice/order has been integrated into the system. This system has been 'Recovery Challan Certificate & Registers' system and this integration completes 360 degree work flow of Dealer Assessment Procedure.

Integration of Enforcement work with E-Assessment has also been done

Returns Scrutiny Assistance System has been developed for enabling officials to scrutinize the returns data filed by the dealers on the basis of predefined parameters Incomplete Return, Difference in Rate of Tax, Purchase not verified, Calculation, Rate of Tax, admitted not deposited, Principal purchase not verified, Discrepancy in claim of ITC ,Discrepancy in claim of RITC Incomplete Return etc. the system has been integrated with E-Assessment so that proper actions is taken against defaulters

PROBLEMS IN THE MANUAL SYSTEM

The issues faced in the conventional system are summarized as follows:

- Officers have to make multiple times of open or visit to the process of Manual Case Register.
- It takes too much time for generating and sending notice and order.
- Officers had to wait for long hours to generate any notice and Order.
- No standardized procedure to educate dealers on what information is to be submitted by them.
- Old ways of sending the Notice/Orders via Speed Post or by the office carriers to deliver the same to dealers.

  No assurance of serving notices/orders in time and thereafter timely action by the concerned dealer.
- Loss of revenue due to loss of notice/orders and no proper way of chasing the dealers to collect the revenue. No proper monitoring of work done by officials at distant locations and revenue collection.
- No proper Case registers (R5A, R5b, R3, R6, R27 etc) management and finding the information in the manual registers at different sector offices used to be tedious tasks.
- No proper case to case monitoring of recovery challan, its disposal and amendment.

AUTOMATED SYSTEM

Key features of this automation are:

- All the assessment notices and orders are being issued online from 01 August 2014 onwards.
- Unique Assessment order Number for all Orders
- Unique RC (Recovery Certificate) number for all demands
- By unique order number, status of post-assessment proceedings of any order can be Tracked/ Monitored.
- Monitoring of the quantity of disposal and quality of orders can be done online.

- Notices/Orders are developed in online & offline mode for longer Orders (say 50 pages long) by technology of converting uploaded word document to html on the fly and print as continuous html on web, provision.
- Work flow & Role based Notice/Order Entry/ Verification and Generation
- Various Assessment Related Registers (R5A, R5B, R16) Automated.
- Assessment case transfer process during cases disposal automated.
- This module is linked with other modules like E-Registration, E-amendment, E-return filing, and Enforcement (SIB, Mobile Squads & Panji5) OCS, appeal and E-services portal for dealers under the project in order to file assessment case as per the tax deposited by the dealers and their business activities.
- Complete zone wise, range wise, location wise MIS have been developed on VYAS-Assessment and have been reflected on e-services portal for dealers also so that dealers can view all notices/orders issued to them along with other valuable information on portal.
- Total elapsed time for notice /order service – 10 days in manual system & Online in automated system
- Use of XML to store different type of Notice and Orders having different formats along with MIS supporting important indicators in database in XML type field has been fist time innovation during automation of Dealer Assessment as E-Assessment.
- Technologically, Microsoft Word Template as offline tool to write the 40-50 pages long notices/ Orders and on uploading the same, combining it as running text in HTML during Notices/ Orders generation on the fly in ASP. NET Programming, was new that has been incorporated in the system. This solution was widely accepted and E-assessment could be a success in real time.
- Digital Capture of the Assessment Process information
- Digital Capture of the Additional Demand Booked and their collection
- Increases the efficiency, transparency and accountability of the Assessment Process
- To make proper, efficient and effective use of the limited Human resources
- To reduce Paper consumption and to move towards a paperless office.
- Online monitoring possible
- Online availability of demand date for effective monitoring
- Format makes the order preparation easy and proper
- Automatic maintenance for registers possible.
- R5A, R5B registers, 15 notices and 22 Orders have already been automated in e-Assessment; Also different registers regarding Recovery Challan R3, Refund R27 and other registers will be automated and interlinked with each other so as to complete 360 degree automation in various services under the Department of Commercial Taxes.
- The various types of notices and Orders (Table 1 and table 2) are generated against dealers, who are defaulter at the time of assessment based on the information of their business activity and returns filed by them.

Table 1: Type of Notices

Notices:	
Closure Notice	Notice Under sub-section 11 of section 17 of UPVAT ACT 2008
Notice 25	Notice Under Section 25(1)
Notice 28	Notice Under Section 28 of UPVAT Act 2008
Notice 29	Notice Under Section 29 of UPVAT ACT 2008
Notice CST 9 (2)	Notice Under Section 9(2) of CST
Notice Entry Tax 9 (4)	Notice Under Section 9(4) of UP Entry Tax Act 2007
Notice CST 9 (2) Provisional	Notice Under Section 9(2) Central Sales Tax (CST) Act 1956 for Provisional Tax
Notice 10	Notice Under Section 10(1) of UP Entry Tax Act 2007
Notice 54 (1) (14)	Notice Under Section 54(1)(14) of UPVAT Act 2008
Notice 54 (1) (2)	Notice Under Section Sec 54(1)(2) of UPVAT Act 2008
Notice 48 (5)	Notice Under Section Sec 45(5)of UPVAT Act 2008
Notice 8-A	Notice Under Section 8A of CST ACT 1956
Notice 10-A	Notice Under Section 10A of CST ACT 1956
Notice U/s 45 (13)	Notice Under Section 45(13)A of UPVAT ACT 2008

Table 2: Type of Orders

Orders:	
Order of Suspension	Order Under Section 12 of Sec 17 of UPVAT Act 2008
Order 28(2)(i)	Order Under Section 28(2)(i) of UPVAT Act 2008
Order 28(2)(ii)	Order Under Section 28(2)(ii) of UPVAT Act 2008
Refund order	Refund Payment Order(Form-33)
Order CST 9(2)	Order Under Section 9(2) CST Act 1956
Order Entry Tax 9(4)	Order Under Section 9(4) UP Entry Tax Act 2007
Order 25 (i)	Provisional Tax Assessment Order Under Section 25(1)
Order 10	Order Under Section 10(1) UP Entry Tax Act 2007
Order 54(1)(14)	Order Under Section 54(1)(14) of UPVAT Act 2008
Order 54(1)(2)	Order Under Section 54(1)(2) of UPVAT Act 2008
Order 48(5)	Order Under Section 48(5) of UPVAT Act 2008
Order 8-A	Order Under Section 8(A)of UPVAT Act 2008
Order 10-A	Order Under Section 10(A) of UPVAT Act 2008
Refund Order (Form 33 A)	Adjustment order and voucher Form 33(A)

Order Brickln Section 6	Order Under Section 6 of Brickkiln Composition Under UPVAT act 2008
Order Brickcln 50 Lakh	Order for dealers opted composition(Below 50 Lakh T.O.)
Order Work Contractor	Order for Composition for Work Contractor Under UPVAT Act 2008
Order Tent	Order for Composition of Tent Dealers Under UPVAT Act 2008
Order Section 22/31	Order Under Section 22/33 of UPVAT Act 2008
Order Section 54	Order Under Section 54(1) to 54(22) of UPVAT Act 2008
Cancellation Order	Order for Notice Cancellation
Order U/s Application 32	Order Under Section 32 of UPVAT ACT 2008
Miscellaneous Order	Miscellaneous Order Under UPVAT Act 2008

INTERNAL/ EXTERNAL INTERACTIVE SYSTEMS WITH E-ASSESSMENT

The systems interacting with E-assessment are shown in Figure 1.



Figure 1: Systems Interacting with E-Assessment

INPUTS TO DEALER ASSESSMENT

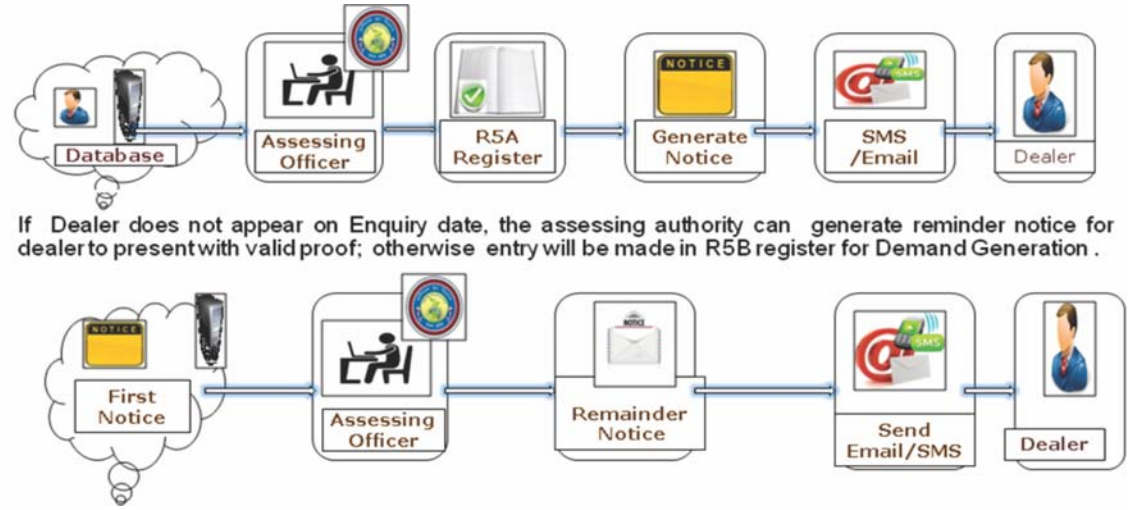
Various inputs to dealer assessment are shown in Figure 2.



Figure 2: Inputs to Dealer Assessment

PICTORIAL PRESENTATION OF WORKING MODEL OF E-ASSESSMENT (Notices & Orders)

The working model of e-assessment is shown in



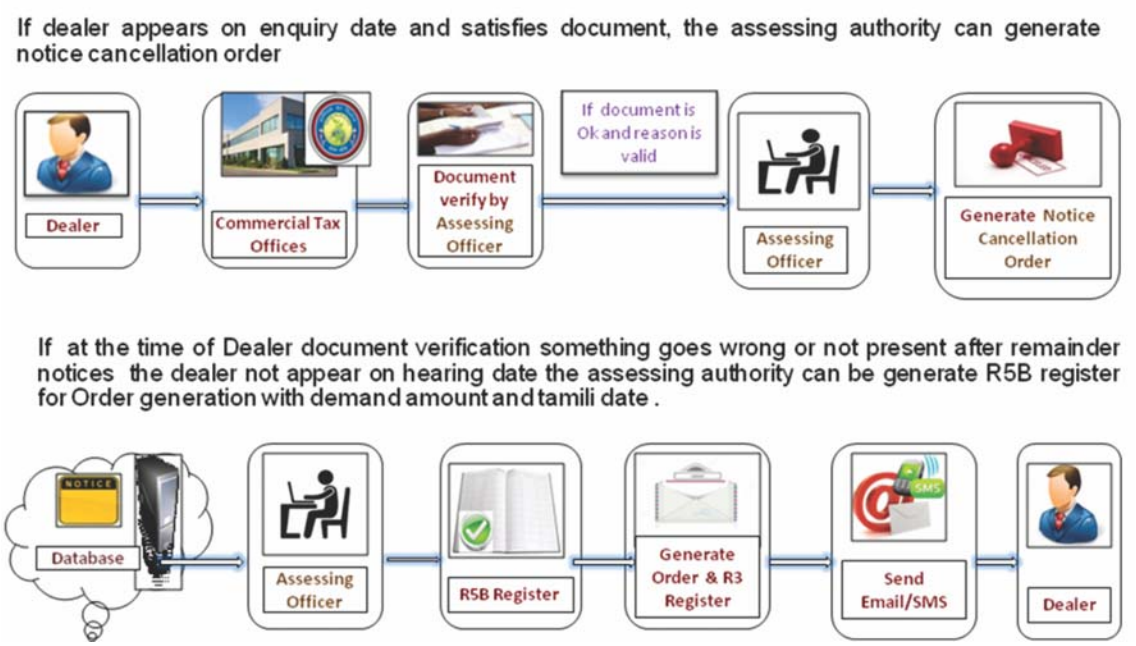


Figure 3.1: Working Model of E-Assessment

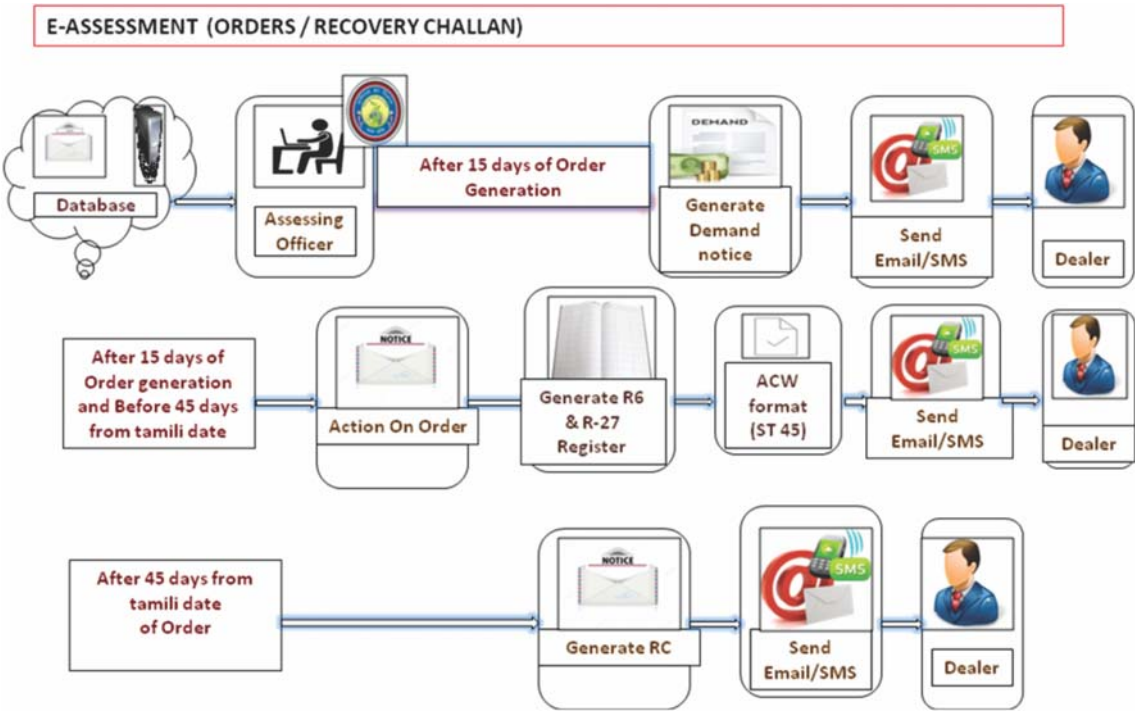


Figure 3.2: Working Model of E-Assessment

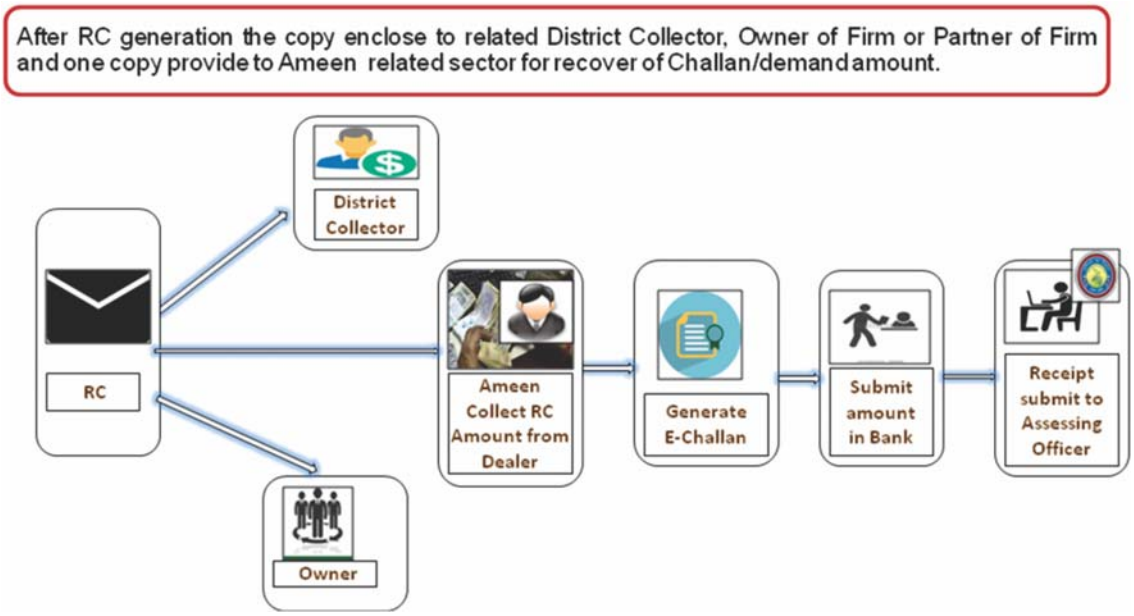


Figure 3.3: Working Model of E-Assessment

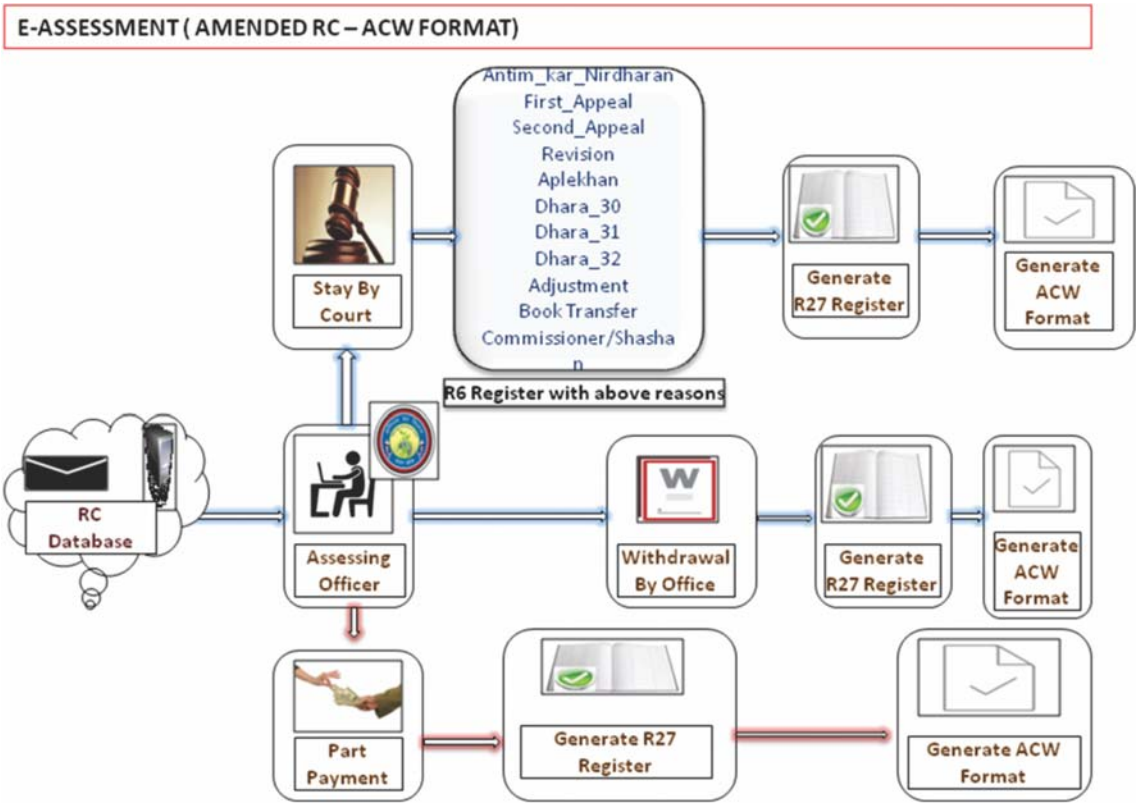


Figure 3.4: Working Model of E-Assessment

TECHNOLOGY INCLUSION

The technology used for the system is summarized below:

- ✓ Front End Technology –
  - o Visual Studio 2010,
  - o ASP DOT NET Framework 4.0
- ✓ Back End Technology -
  - o Data Server - SQL SERVER 2008 R2
  - o Web Server – IIS 7.0
  - o Windows Server 2008 R2,
  - o SQL Server clustering,
  - o Load Balancing,
  - o Blade Servers,
  - o VPN for operations from 1349 sector offices at 95 locations in UP.
  - o Fibre Cable Network,
  - o Data Centre at SDC (State Data Centre),
  - o SDC has its DR at Pune
- ✓ Service delivery channels -Web, email, PUSH & PULL SMS.

PROCESS RE-ENGINEERING

The process re-engineering aspects of the system are:

- ➢ The portal developed has backend accessibility to all the functional units of the Department.
- ➢ Policies, Procedures, Circulars, Notifications and different forms have been made available through website and through various channels.
- ➢ Feedback mechanism has been developed so as to get constant feedback and proper monitoring mechanism should be developed to work on the feedback.
- ➢ Government Process Re-engineering and easy form designing so that it will be easy for the dealer as well as for replication in the system
- ➢ Inter-sectoral assessment case transfer to expedite flow of case Information between different sectors.
- ➢ Web solutions have been developed to ensure that the content is regularly updated and also the repetitive tasks are done on a click for example generation of same type of notice and orders.
- ➢ Service levels/roles have been defined for every service, to measure the quality of service delivery; content entered by steno, officials can verify and digitally sign the notices/orders.
- ➢ Capacities Building for the Dealers and the Departmental Officers and Staff is accomplished through regular meetings/ trainings/ workshops.
- ➢ A comprehensive Human Resource Management System has been developed.
- ➢ Digital Certificate Registration system for departmental officials has been automated for registering their Digital Signature in VYAS for enabling them for facility of digitally signed certificates, notices and orders. Corresponding monitoring MIS has been put n place for speedy registration by officials.

- Regular training and seminars are organized to motivate employees and enhance their service delivery skills
- Establish data privacy and protection laws and online transaction mechanisms to develop confidence and trust protection by following Software Security Audit standards and by establishing VPN(Virtual Private Networks) for Intranet portions of E-Assessment being operated by 1349 sector offices at 95 locations in UP.
- Online feedback and online Grievance Redressal mechanism.
- Accessibility (Time Window)- Services in offices 10 AM to 5 PM & online services 24 x 7.
- Deliverable services are available to dealers at home on internet.
- Application Status Tracking – anytime anywhere.
- Web Applications have been security audited by Third Party 'CyberQ Consulting Private Limited'
- Digital Capture of the Assessment Process information
- Digital Capture of the Additional Demand Booked and their collection
- Efforts towards Increasing the efficiency, transparency and accountability of the Assessment Process
- Efforts to make proper, efficient and effective use of the limited Human resources
- Efforts to reduce Paper consumption and to move towards a paperless office.

PRACTICAL WORKING CHANGES OF E-ASSESSMENT

- Generate notices/orders with few parameters entry and thus avoiding the repetitive task of getting the lengthy language of notices/orders typed and then verify and sign.
- Steno and Officials roles have been enabled for their restricted access of work scope.
- E-Assessment has been implemented with an objective of facilitating both ends Officials and dealers.
- Officials facilitated with an easy, quick, transparent and in time looking into the dealer related business registration information and sales/purchases declared in the annual returns at a click on their dashboard in the automated system of E-assessment.
- As an another leap towards Green Governance, Department started Digital Signature Certificate Registration upon having all the trade related documents, provided to dealer, digital signed and thus making sending signed documents by post, an old tale of the past.
- With the e-Assessment, Now a dealer can view his notices/orders on his mobile, email or on dealer services portal, available 24 x 7, any time anywhere and can take timely actions against it that save him unnecessary penalty or other harsh actions from the commercial tax department
- With the designed MS Word Template offline Tool for lengthy orders under e-Assessment, officials can fill up the order offline electronically with ease in any number of sittings, bring it to a place with internet facility and can submit the order content of with a single click and that gets added to the entry portion of the order as running text and order is generated easily and delivered via SMS & email to the dealer.
- DMs have been provided login credential for monitoring the Recovery Challan Certificates, marked to them for recovery from the dealers, whose main business office lies in DMs district.

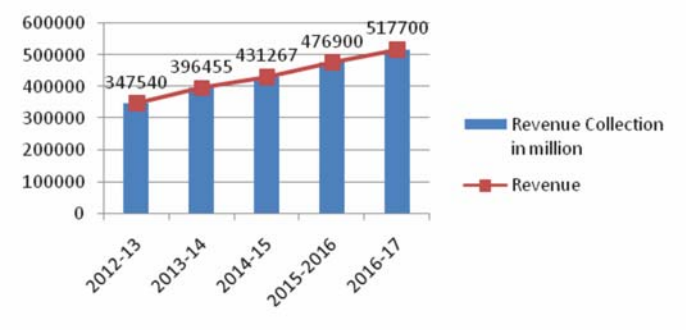
- E-Challan System has been developed for Ameen to submit the collected amount against RC through uniquely identifiable E-Challan; thus monitoring of collected revenue is easy and also the same information in the automated system is used during the disposal of issued RC and considering all aspects of amount deposited, amount stayed by courts/higher authorities etc., the RC is taken back and amended ST-45 is generated for balance amount to be recovered from the dealer.
- At a click notices/orders are delivered to dealer on his registered mobile and email as soon as it is generated by the officials. The same has been made available of 'Dealers Services Portal' under the authorized logged-in dashboard for dealer. This removes the possibility of delay in serving of the notices/orders and loss of the same.
- Use of XML to store different type of Notice and Orders having different formats along with MIS supporting important indicators in database in XML type field has been fist time innovation during automation of Dealer Assessment as E-Assessment.
- Technologically, Microsoft Word Template as offline tool to write the 40-50 pages long notices/ Orders and on uploading the same, combining it as running text in HTML during Notices/ Orders generation on the fly in ASP.NET Programming, was new that has been incorporated in the system. This solution was widely accepted and could be a success in real time.
- Work flow and Role based Notice/Orders movement and monitoring of various Recovery Challans has eased the decision making in transparent manner in time and Automatic preparation of Assessment Related Registers R5A(for First Notices/Orders), R5B(Orders) and R16 (Reminder Notices)
- Recovery Certificate and Registers, has also been launched along with developed 'E-Assessment – Notices/Orders' system. This automated Assessment system has completed the 360 degree work flow of Assessment Procedure and proves to be very effective in reduction of assessment pendency, and in generation of transparent and linked information regarding a particular assessment case through R5A register entry to order generation to R3 Register entry, R6 register entry, r27 register generation as per the case may be and finally RC generation and its follow up for the collection of tax demand/ penalty from the dealers. It has ease out the work of maintaining various assessment
- In manual system around 10-15 days were taken to serve a notice/order; but with automated system, digitally signed Notice/Dealers is made available online on dealer's e-services portal. The same is conveyed via SMS & email on registered mobile and email account.
- This innovative approach towards use of IT in dealer community saves its time and increase the satisfaction level while receiving neatly printed notices/orders from anywhere, anytime and enable the dealer to take prompt timely actions against it and thus saves him from further penalty and other harsh actions from the commercial tax department.

Some of the important statistics pertaining to the system are shown in Table 3.

Table 3: A Few Important System Statistics

	Financial Year	2014-15	2015-16	2016-17
1.	Dealers	11,72,848	12,81,167	14,62,806
2.	Notices	4,33,949	7,48,161	10,89,789
3.	Orders	2,25,099	4,68,462	6,55,132
4.	RCs	1,90,402	1,32,093	1,29,648

Overall Revenue growth for the Department of Commercial Taxes is shown in Figure 4.



- *% Revenue growth since inception in the year 2013-2014 ~ 14.08%*
- *% Revenue growth since inception in the year 2014-2015 ~ 24.09%*
- *% Revenue growth since inception in the year 2015-2016 ~ 37.30%*
- *% Revenue growth since inception in the year 2016-2017~ 48.96%*

Figure 4: Revenue Growth of the Department of Commercial Taxes

Towards Green Governance:

As an another leap towards Green Governance, Department now deciding upon having all the trade related documents, provided to dealer, digital signed and thus making sending signed documents by post, an old tale of the past.

Following table depicts about how much savings can be done by achieving green governance:

Direct Cost saving in terms of paper under various modules E-Receipt, E-Registration, E-amendments, Assessment (Notices & Order) for the department in terms of Paper, Postage, Fuel and Employee during a month.

Total saving for the department in terms of Paper, Postage, Fuel and Employee and contribution to green governance are brought out in Tables 4 and 5 as follows.

Table 4: Cost Savings

Cost	Per Month	Per Year
Paper Cost @ INR 1	36,73,714/=	4,40,84,568/=
Postage Cost @ INR 25 per speed post	24,23,050/=	2,90,76,600/=
Fuel Cost @ INR 60 per trip Document	58,15,320/=	6,97,83,840/=
Total	1,19,12,084/=	14,29,45,008/=

Table 5: Contribution to Green Governance

Contribution to Green Governance	Per Month	Per Year
Number of papers can be saved	36,73,714	4,40,84,568
No. of Poplar Trees saved (1 tree makes 8,333.3 sheets)	441	5290
Water Saved (10 liters for one A4 size page)	3,67,37,140 liters of water	44,08,45,680 liters of water

Assumptions

a. Total Paper Usage for Dealer Application : 32 pages * 2 (As 2 copies required)
   i. Application – 10 pages
   ii. Documents with application – 10 pages
   iii. Enquiry, Survey – 10 pages
   iv. Registration Certificate – 2 pages
   v. As per Registration Application(2014-2015) data available 7645 Registration granted per month, so Paper usage: 32* 7645*2= 4,89,280 & per year 489280 * 12 = 58,71,360
   vi. Cost of Toner/paper @ Rs 1 = 4,89,280 /= per month & 58,71,360/= per year
   vii. Cost of postage @25 Rs in one month = 7645*25=19,11,25 & in a year 191125 *12=22,93,500/=
   viii. Fuel cost @Rs 60 per certificate in one month = 7645* 60 = 4,58,700/= & in a year = 458700*12 = 55,04,400/=

b. Total Paper Usage for Dealer Registration Amendment: 20*2 pages (2 Copies required)
   1. Application – 8 pages
   2. Documents with application – 10 pages
   3. Amended Registration Certificate – 2 pages
   4. As per Registration Amendment granted (2014-2015) data 3819 per month then Paper usage: 20*3819 *2= 1,52,760 & per year 152760* 12 = 18,33,120
   5. Cost of Toner/paper @ Rs 1 per month = 1,52,760 /=
   6. Cost of Toner/paper @ Rs 1 per year = 18,33,120/=
   7. Cost of postage @25 Rs in one month = 3819*25 = 95,475 & in a year 95475*12 = 11,45,700 /=
   8. Fuel cost @Rs 60 per certificate in one month = 3819*60 = 2,29,140/= & in a year = 229140*12 = 27,49,680/=

c. Total Paper Usage for Dealer Assessment (Notices) : 2 *2 pages (2 Copies)
   i. Number of pages in one notice: 2
   ii. As per Assessment Data(14-15), number of notices per month: 53743
   iii. Pages usage per month: 53743*2*2 = 2,14,972
   iv. Pages usage per year: 214972 * 12 = 25,79,664
   v. Cost of Toner/paper @ Rs 1 per month = 2,14,972/=
   vi. Cost of Toner/paper @ Rs 1 per year = 25,79,664/=
   vii. Cost of postage @25 Rs in one month = 53743* 25 = 13,43,575/= & in a year 1343575* 12 = 1,61,22,900/=
   viii. Fuel cost @Rs 60 per certificate in one month = 53743* 60 = 32,24,580 & in a year = 3224580 *12 = 3,86,94,960/=

d. Total Paper Usage for Dealer Assessment (Orders) : 25 *2 pages (2 Copies)

1. Number in one order on an average : 25
2. As per Assessment Data(14-15), number of notices per month: 31715
3. Pages usage per month: 31715*50 = 15,85,750
4. Pages usage per year: 1585750* 12 = 1,90,29,000
5. Cost of Toner/paper @ Rs 1 per month = 15,85,750/=
6. Cost of Toner/paper @ Rs 1 per year = 1,90,29,000/=
7. Cost of postage @25 Rs in one month = 31715* 25 = 7,92,875/= & in a year 792875* 12 = 95,14,500/=
8. Fuel cost @Rs 60 per certificate in one month = 31715* 60 = 19,02,900 & in a year = 1902900*12 = 2,28,34,800/=

e. Total Paper usage for receipt acknowledgement : 1*2 (2 copies)

1. Number of pages per acknowledgement: 1 page
2. Number of acknowledgement per month: 6,15,476
3. Page usage per month: 6,15,476*2 = 12,30,952 pages
4. Pages usage per year: 1230952 * 12 = 1,47,71,424 pages
5. Cost of Toner/paper @ Rs 1 per month = 12,30,952 /=

   Cost of Toner/paper @ Rs 1 per year = 1,47,71,424 /=

IMPLEMENTATION CHALLANGES

Some of the key challenges faced during implementation are as follows:

- Understanding Manual field level Business process – Getting inputs from departmental officials in terms of automation of the manual system and their expectations from the system. Understanding roles and jurisdiction of various level officials on certain functionality.
- Attracting, developing, and training certain group of Departmental officials as IT Team for enabling them understand IT and think their department's functionality in terms of computerized system.
- Software development in such a manner that work-flow, roles/ jurisdiction, authorization of various level officials is maintained without disturbing the way they use to work in manual system. Implementation challenges had been disinterest, lack of computer training among field level officials who simply use to sign the documents in manual system.
- Security and privacy of different data as officials used to share their login/password with operators.
- Poor clarity and predictability of corporate goals/directions in terms of various modules, automated and hence automation had to go a number of iterative prototypes before going to final workable model.
- Insufficient business commitments of staff to support IT investments development.
- Non-acceptance of various services automation in Dealer Community due to lack of training on viewing information/ applications on Net.
- Meetings, dealer workshops, trainings are conducted on regular basis and accordingly dealers/ officials suggestions/feedback are incorporated in the system, if required and agreed upon

by the department. Hence this project maintains and boosts the working satisfaction level in the dealer community and thus its sustainability is ensured.

- Challenges with the changes in any IT System are inevitable. Department has created a systematic structure to ensure that changes to system are done after proper analysis and with due authorization from concerned authorities.
- A Committee has been constituted to evaluate the changes suggested by business users from across the field offices. Further, the changes in acts/rules/forms are done in consultation with IT Wing so that the new provisions are IT-friendly and dealers/taxpayers do not face problems in using the Automated System.
- AMC of hardware equipment & renewable of Licenses & Procurement model adaption for H/W, S/W and various services like lease line, outsource manpower etc -This project is under State Mission Mode Project. It is being designed & developed by joint efforts of NIC and the IT team of the department and hence it is a sustainable model because of government to government involvement in the project.

CONCLUSION

The complete system of E-Assessment with Recovery Challan Certificate Disposal has enabled 360 degree computerization of all functions of the Commercial Tax Department and Uttar Pradesh State has become the first State in the country to enable Online generation of digitally signed Notices/Orders and delivery of the same via SMS, email and Dealer Services Portal so as to timely actions by dealers against notices/orders, reduction in repetitive task of notices/orders typing, serving time and/or loss of notices/orders and increase in revenue collection. The software is self-sustainable. The project implementation has been done by NIC UP State Unit, which is available for s/w support on 24 x 7 basis and software is being worked upon by the officials of the Department of commercial taxes. It satisfies the requirement of all the stakeholders and all modules within the project are inter-dependent and efficiently managed.

This effort of digital Inclusion for secure, assured delivery system has been appreciate by officials as well as dealer society and proves to be a small but strong progressing step towards transparent Green Governance.

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Intersection of Big Data and Knowledge Management for Organizational Competitiveness

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Abstract

The success of any organization depends on the precision and aptness of the decisionsmade by the employees who are the assets of the organization. The employees are the possessors and processors of knowledge in an organization. Knowledge Management (KM) helps any business to synergise the tacit and explicit knowledge available and use them to make quality decisions for the organizationalexcellence. These decisions help the organizations to strategize and reinvent in tough times. Big Data helps to scrutinize, organize and arrange the huge amount of data available in the form of knowledge to extract the best and most valuable information out of it and provides a competitive edge to the organization. The purpose of this paper is to understand the relationship between big data and KM and also to understand how big data can act as an enabler for effective KM.

A systematic review of peer-reviewed research papers and articles has been carried out to understand the intersection between big data and KM obtained mainly through various sources like Emerald, Google Scholar and other databases.

This study provides a conceptual model reflecting linkages between big data and KM, contributing to divulge clarity to a greater extent.

Although big data is gaining attention in research but a limited research exist putting big data and KM in one framework hence, it remains underdeveloped within the KM literature. This study is a conceptual paper that needs empirical testing.

This paper contributes to reveal the intersection between big data and KM resulting in a conceptual model and shed some more light on the aforementioned topic adding on to the literature.

Keywords - Big Data, Knowledge Framework, Knowledge Management

Introduction

Since the formation of knowledge economy, organisations have become familiar with the concept of KM. However, it still remains a challenging domain for them and contemporary procedures have to be acquired in order to cope with the challenges. Employees are the knowledge assets

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in present times as they usher the process of novel knowledge creation. This knowledge is more valuable than the information generated by organisation itself. This emerging inclination towards KM has led to innovation in the sphere of technology at a swift pace, knowledge is being given enormous significance as a way of gaining competitive edge.KM helps any business to synergise the tacit and explicit knowledge available and use them to make quality decisions for the organizationalexcellence. These decisions help the organizations to strategize and reinvent in tough times. Big data helps to scrutinize, organize and arrange the huge amount of data available in the form of knowledge to extract the best and most valuable information out of it and provides a competitive edge to the organization. This way big data and KM both are value creation approaches that exploit the technological and knowledge assets in order to maximize opportunities and achieve business goals. Merging these two disciplines of big data and KM has become an area of interest in business and research. This paper has been arranged in the following parts: The first part deals with the review of management literature on the discussed topics: big data, KM and intersection of big data and KM.This section aims to provide a detailed summary of the prevalent literature in order to identify the crucial areas for prospective research and also to comprehend the intersection of big data and KM. In the next section a detailed view of intersection of big data and KM, introduced in literature review, and is presented in a way leaning towards identifying the probable role of big data in the different dimensions of KM.The focus of this paper is to look at the concept of big data and KM in unison with each other. It also aims to understand the association between big data and various areas of KM and to comprehend its effectiveness for the same, based on which a conceptual model is constructed. Final section presents conclusion, limitation and future scope of research.

Literature review and theoretical underpinning

Big Data

Big data has garnered a lot of curiosity in recent years. Now-a-days, due to the immeasurable dissemination of information via electronic devices and innovation in IT industry, the volume of data is on a whole new level than before. Davenport and Patil (2012) have acknowledged big data as a revolutionary force to analyse big volume of data. Due to the immense amount of data available around us, business houses have recently realised the need and significance of tackling this data and storing and using it for making meticulous decisions (George et al., 2014). Decisions based on factual information are always better than those based on instincts and this potential is provided by big data to the organisation using which the companies can gain competitive edge (Mc Afeeet al., 2012). The current prevailing technologies are too traditional to handle huge amount of data available these days, therefore big data as a special tool helps to extract knowledge from this data (Manyika et al., 2001; Kabir et al., 2013). Many companies have suddenly realised the significance of big data for gaining competitive advantage as it is considered to be a source for new knowledge, innovation and valuable insights.Bigdata helps to view businessholistically and transform the knowledge into something more valuable in order to gain a competitive edge (Kabir et al., 2013). The actual worth of big data is derived only when it is utilized for decision making. The approach adopted for conventional practices of data analysis cannot hold true for big data. Big data is attributed by three major aspects namely the 3V's:Variety, Velocity and Volume (Sagiroglu & Sinanc, 2013; Zikopoulos & Eaton, 2011;Russom, 2011; Kaisleret al., 2013; Katal et al., 2013; Dong & Srivastava,2013; Elias & Carayannis, 2017).

Variety: Since there are innumerable sources of data available around us owing to information technology, the variety of data increases significantly, these resources can be classified into three categories: structured, semi structured and unstructured. The data residing in a secure file

which makes it easier to retrieve can be termed as structured data. The data which is gathered from vague sources can be hard to scrutinize is the unstructured data and semi structured data on the other hand is the one which is not organised into some specialised source but still has some tags to make it more prone to processing than raw data.

Volume: This is a great challenge encountered by the organisation since there is a tremendous amount of data available running in terabytes and petabytes. As a consequence of which the long-established techniques of data analysis cannot be used to process this enormous amount of data.

Velocity: The rate at which the data is created and analysed is extremely important these days. Faster streaming would enable the organisations to make better use of the processed data which can be utilized to make valuable decisions.

Knowledge Management

Knowledge has been perceived to empower individuals, organisations resulting in to the rise of knowledge economy.Knowledge has acquired a vital position in this era. Knowledge has been defined as "set of justified beliefs, which can be managed to enhance the organization's capability for effective action" (Nonaka, 1994;Alavi& Leidner,2001; Zaheer & Tim, 2017).The transfer of knowledge becomes a very cumbersome task as it is quite personal in nature. The organisations have now begun to realise the significance of tapping in and managing this knowledge which is immersed in the brain.To control knowledge resources within an organisation,KM recognizes, captures, and processes all organizational knowledge (Wolf 2012). There are known to be three KM processes namely the acquisition,conversion, and application of knowledge (Gold , Malhotra & Segars, 2001; Alavi et al., 2006; Kulkarni et al., 2007; Gasik, 2011; Khan, Zaheer, et al., 2017). According to Gao etal.(2008), KM can be classified into two groups namely hard groups and soft groups. Hard groups deal with the explicit knowledge that works on the assumption that knowledge comes from informationwhich is a result of data processing and data is obtained from events where as soft groups which deals with the tacit knowledge which say that knowledge is different from information and resides in human mind.

Intersection between Big data and KM

The conversion of knowledge from one type to the other is not always an easy task for organisations, as organisations have to make systematic efforts to reap the benefits of tacit knowledge. It is in this context that the role of bigdata becomes vital in capturing, acquiring and sharing huge volumes of explicit knowledge using big data text analytics and may be interpreted through tacit insight (Khan & Vorley, 2017; Davenport, 2013; Scarbrough & Swan, 2001).According to Pauleen & Wang (2017), knowledge is the fundamental aspect of any deliberation around big data. In the absence of knowledge, big data and analytics cannot prevail as it is the knowledge of the capital assets which has expanded the potential of big data. The judgement of the aspect of collection of data and using the techniques to analyse it entirely relies on the experience of the humans. Hence the impact of knowledge cannot be neglected when debating about the impact of big data. Knowledge plays a critical role in big data as it is human knowledge that will confer how the information extracted from big data will be used, whether the data generated is used in operational, tactical or strategic areas, knowledge will guide its use.Big data is considered as a source with great potential to create novel knowledge. Beyond the transactional data used by many organisations, there exists a potential treasure of non – traditional, less structured data which is big data that can be mined for useful information (Rajpathak & Narsingpurkar,2013; Upadhyaya &Karaki, 2015). Big data and information derived from big data, is considered as a base for decision making, creating novel knowledge, which in

the end is proposed to increases quality and trustworthiness. Kabir and Carayannis (2013) has outlined the basic requirements like management support,infrastructure, people,data driven culture, absorptive capacity as prerequisites for a big data initiative that aims at creating competitive edge. Few of the selected studies which show linkages between big data and various variables of KM have been listed below:

Table 1. Linkage Between the Variables

Title of the Paper	Main Findings	Source
Interrelationship Between Big Data and Knowledge Management:AnExplor atory Study in the Oil and Gas Sector	• Generation of predictive knowledge • Improve KM capabilities • Effective decision making	Sumbal et al. Journal of Knowledge Management (2017)
Big Data Systems: Knowledge Transfer or Intelligence Insights?	• Similarity between Big data and KM structure	Rothberg , Helen N . , et al. Journal of Knowledge Management (2017)
Creation of Knowledge -Added Concept Maps: Time Augmentation v ia PairwiseTemporal Analysis	• High correlation between temporal assessment and subjective assessments	Sasson,Elan, et al. Journal of Knowledge Management (2017)
Cognitive Big Data: Survey and Review on Big Data Researchand Its Implications. What's Really Ne w in Big Data?	• Five Trait Framework for Big Data 1. Socio -technical system 2. Data space 3. Data richness 4. Knowledge management 5. Decision making 6. Sensory/visualization	Lugmayr, Artur, et al. Journal of Knowledge Management (2017)
Facilitating Knowl edge Management t hrough Filtered Big Data: SME Competitiveness in an Agri-Food Sector	• Big data consumer analytics helps in tapping explicit and tacit knowledge • Effective implementation of KM processes needed in SMEs	O'connor, Christina, et al. Journal of Knowledge Management (2017)
Big Data Text Analytics: An Enabler of Knowledge Management	• Empower KM	Khan, Zaheer et al. Journal of Knowledge Management (2017)
Big Data and Knowledge Management; A Case of DÉJÀ VU or Back to the Future?	• Pattern analysis and prediction with application of algorithms • Data driven decision making • Big data as a contributor to KM	Tian,Xuemei&Xuem ei Tian Journal of Knowledge Management (2017)
Information and Reformation in KM Systems: Big Data and Strategic Decision Making	• Identified 4 types of data based decisions which aids KM systems in handling big data and advanced analytics	Intezari , Ali ,et al . Journal of Knowledge Management (2017)

The Concept of Big Data Applied in Personal Knowledge Management	• 5 areas of perso nal knowledge management with application of big data 1. Time m anagement 2. Computer u sage efficiency management 3. Mobile device behaviour management 4. Health management 5. Browser surfing management	Liu, Che -Hung et al. Journal of Knowledge Management (2017)
Big Data and Knowledge Management: Establishing a Conceptual Foundation	• Connection between KM, IC and application of Big data and Business analytics exists • With advance use of Big Data Knowledge assets can be beneficial	Erickson, Scott & Helen Rothberg Leading issues in Knowledge Management (2015)
Big Data, Tacit Knowledge and Organizational Competitiveness	• Inhabited knowledge in Big data has potential of creating economic value • Major source of competitive advantage	Kabir, Nowshade & Elias Carayannis ICICKM (2013)
Big Data Customer Knowledge Management	• Integration of CRM , CKM and bigdata as value creation strategies • increase quality • Improves trustworthiness	Chan, Joseph O. Communications of the IIMA 14 (2014).

Research Methodology

An extensive literature review was conducted to develop a deeper understanding on linkage of bigdata to KM. A systematic review of the literature has been performed using various data base such as Emerald, Google scholar, Research Gate and other database and it was found that very little work has been done on linkage of big data to KM. Various combinations of key words, such as bigdata, analytics, KM, organisational KM, personal KM, customer KM, interrelation of big data and KM, knowledge creation, predictive analysis were used to search the articles. Articles from the field of computer sciences were not included.Almost all the work discussed in literature review just provides an overview and few with empirical research. Although big data is gaining attention in research but a limited research exist putting big data and KM in one framework. This paper contributes to reveal the intersection between big data and KM resulting in a conceptual model and shed some more light on the aforementioned topic adding on to the literature.

Proposed Conceptual Framework

Knowledge reconstruction from one form to another is an onerous task and has always presented a great amount of complications in organisations. Consistent and efficient endeavours are required by the organisations for attainment of its goals with the help of tacit knowledge and hence the contextual relationship of big data analytics with managing of the explicit knowledge arises (Davenport, 2013; Scarbrough & Swan ,2001;Khan et al., 2017).

Bigdata analytics is imperative in order to encapsulate and dispense explicit knowledge which can further be expounded via tacit cognizance using big data analytics and produces new depth of knowledge as a foundation for making more effective decision making (Grant,1996; Kitchin, 2013; Laney, 2012; Khan et al., 2017)which clearly states that there is a contextual relationship of big data analytics and knowledge sharing .The experiential knowledge in any organisation possesses greater value than the explicit knowledge .The congruence of experiential with tacit knowledge leads to novel knowledge creation which can be employed for better decision making in organisations. Bigdata analytics can secure and make effective use of the different sources of knowledge for enhancing organisational performance.

The 21st century economy is a knowledge economy contingent on information and relying on the available intellectual capital. KM is an integral part of every organisation. Organisations rely on the facts, figures and specifically on the knowledge of its employees for decision making process. Bigdata and KM have similar pursuit i.e., disseminating any kind of knowledge and producing conclusive results for an organisation.According to Davenport and Pusak (2000) "Knowledge is a fluid mix of framed experiences, values, contextual information and expert insights that provides a framework for evaluating and incorporating new experiences and information." Malhotra (1998) in his study defined KM as "a synergistic combination of data and information processing capacity of information technologies and the creative and innovative capacity of human being ", Bass (1997) explains KM as "the process of creating, capturing and using knowledge to enhance organisational performance"(Rai,2011;Sumbal et al. ,2017). Big data is taking individual data points across multiple activities and across a large universe of subjects and deriving broad and meaningful sense, it's vast and exponentially growing data sets that may run into Petabytes or even Exabytes. Enormous amount of data that gets collected by online activities like the time we spend on the page, every click and action, location, access modes everything gets anonymized, analysed and trend lined not only for post facto analysis but also predictive and future analysis. It is seen as an opportunity for competitive advantage by all organisations and researchers (Davenport,2013;McAfee and Brynjolfsson, 2012;Intezari& Gressel ,2017).Thus, if we look at the explanation of Big data and KM, a link can be seen as how knowledge can be created through bigdata and further used for enhancing organizational performance. An analogy can be drawn to link big data with KM using the base as data to information, knowledge and wisdom (DIKW) model (Ackoff,1989).

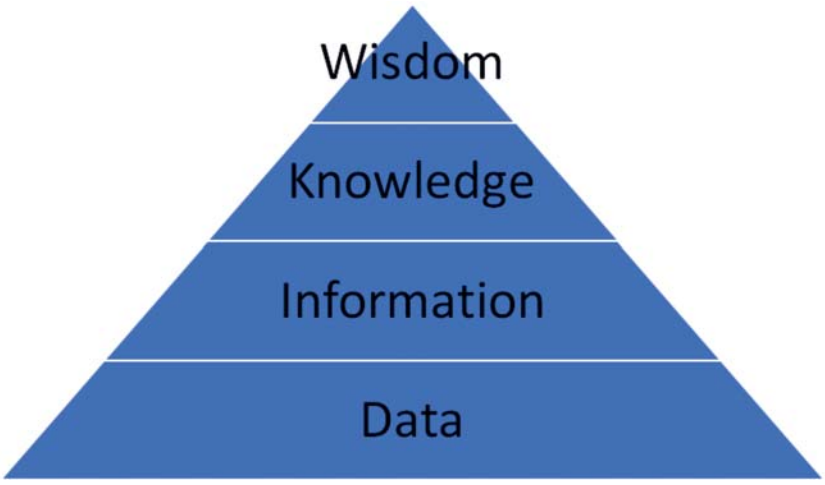


Figure 1: The Knowledge Pyramid (Source: Sumbal et al. (2017)

Data is basically discrete facts, and is in its explicit knowledge form, the flow of activities and events in organisational system without any context but when it is transformed by adding context, it becomes information often in formof metadata.This information which is transformed by reflection based on intuition, personal experience and learning is then converted and transformed into knowledge. On the other hand, big data is the structured, unstructured or semi- structured data available through a variety of sources. When analytics are applied by adding the context to large volume of operational and transactional data which is explicit knowledge it becomes information and resulting in not just information but valuable information and showcases meaningful picture as it organises and structures the data to study underlying trends and patterns.

A central part of the knowledge creation is Information. When this meaningful information is fed into business intelligence tools actionable knowledge is generated which is termed as KM. Knowledge creation according to Nonaka's SECI (Socialization, Externalization, Combination, and Internalization) model is of two types: explicit knowledge and tacit knowledge. Explicit knowledge which is formal and coded form which can also be referred as digital, captured in database and archives which shares the comparable feature like big datawhereas tacitis relatively difficult to be codified and it resides in the heads of people. The tacit knowledge of experienced employees of the organisation holds vital importance when making decisions using big data.Actionable knowledge and intelligence is engendered through blending tacit knowledge of employees with explicit knowledge obtained from big data (Sumbal et al.,2017).

Bigdata as digital data creates explicit form of knowledge, however, to generate knowledge from big data, data need to be managed,analysed and need to be connected to relevant contextwhich is done by individuals, leaving tacit knowledge as a central part of bigdata management (Kudyba,2014). Generation of predictive knowledge from bigdata can be seen as supporting the goal of KM decision making (Bassi,1997; Sumbal et al.,2017). Creating new information and knowledge out of big data which is explicit knowledge, and use it to support decision-making in organizations in combination with tacit knowledge, would enhance the quality and increase trustworthiness of decision-making.We can derive better perception of when and how big data might be found suitable by concentrating on the essential aspects of storing and sharing knowledge. By studying variables such as the nature of knowledge (tacit or explicit), we can predict the types of knowledge is suitable in various industries. From this perspective, we can start to get an idea of when and where further contribution from big data may be helpful (Erickson&Rothberg,2014).Usinganalytics,effectiveKM can be practiced resulting in improvement (Sumbal et al., 2017) and enhanced organisational performance.Thus, this provides a strong link of intersection of big data and KM. The potential value of big data analytics is unlocked and materialized only when leveraged to drive decision making. (Gandomi & Haider, 2015; Sasson et al., 2017). BothKM and bigdata are designed to produce insights that drive better decisions, increase productivity, higher revenue, competitive advantage (Elgendy & Elragal, 2014; Ohlhorst, 2012; Davenport 2017).

Bigdata analytics also plays a vital role in customer KM in assessing the behavioural patterns of consumer using technology platforms such as machine to machine platform and social media. The main aim is to secure structure and unstructured data through big data to transform it into actionable insights using customer knowledge management (CKM) platform helping in generation of knowledge, its dissemination and storage. Further the firms can utilize this knowledge to take data driven decisions to gain competitive edge. Bigdata can also be beneficial at individual level for personal KM and can help in time management, strengthen the efficiency of computer usage management which can indirectly affect the refinement of knowledge. Behaviour

management can be done by collecting big data from smartphones. Health awareness and browser, surfing management are the areas where big data can be applied (Zhao, 2013; Liu, Wang & Lin ,2017). From the organisational perspective, the experiential knowledge merged with explicit knowledge leads to creation of new knowledge. Knowledge residing in big data is indeed tacit and in most of the cases open to explicability. This new Knowledge once extracted can be transferred, used and can also be shared like any other explicit knowledge. This novel knowledge has all potential of creating economic value for an organization and resulting in high productivity, innovation and growth. Thus, it is also a major source of competitive advantage (Kabir & Carayannis, 2013).

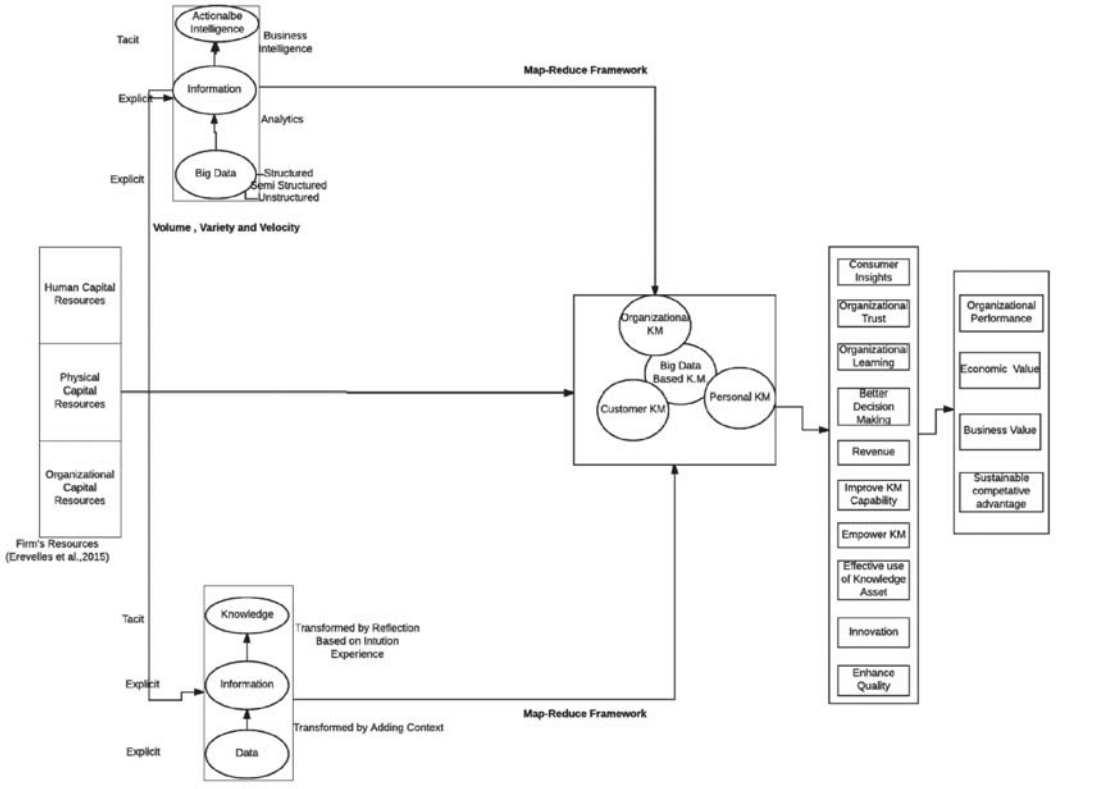


Figure 2: Big Data Knowledge Management Intersection - Conceptual Model (Source: Created by authors)

Conclusion

The 21st century economy is an epitome of knowledge economy in its finest form banking upon its intellectual capital. KM as a field of study has advanced a lot since its inception. Over the years, KM has evolved not only in theory but practice promoting organisational competitiveness. Technology in close association with KM and with the introduction of big data, organisations are benefiting from innovative solutions.

This paper provides a conceptual framework by identifying interrelation between the rapidly developing big data and well-established KM. On the basis of the literature reviewed, a profound

connection can be observed between big data and KM. This association of big data and KM sheds light on the fact that it is functional at a monumental level as organisational knowledge management (OKM), at individual level at personal knowledge management (PKM) and also at other levels like CKM.

The intersection of big data and KM alleviates the process of generating predictive knowledge which helps in enhancing KM capability and aids in effective decision making. This intersection is beneficial to all kinds of organisations; big or small. The effective KM processes should be implemented with big data and KM. The two concepts don't work in isolation. Along with this, there should be an intermingling frameworkof culture and strategies for big data feature as a contributor to KM and help to reap the benefits from the knowledge assets for an organisation.

There also exists an interdependent relationship between big data and KM because the structure of the both the domains are quite similar.Also,big data is incorporated in various levels of KM like analysing consumer behaviour pattern, capacity building, sales support, reporting,etc.Similarly,KM theory also serves utilitarian purpose, guiding the installation of big data systems.This congruence of big data and KM would lead to improvisation of decision making ability, increase in creating an environment of trust in an organisation, empowers the existing KM systems, creating an ambience of learning at both individual and organisational levels.This will lead to greater benefits from knowledge assets thereby enhancing the quality and eventually increasing the revenue of the organisation.As illustrated by the model, this intersection of big data and KM would result in creation of economic value, business value, improved organisational performance and accomplishing sustainable competitive advantage.

Limitation and Future scope

This study is conceptual in nature needing empirical testing. The literatures found in the discussion discussing the association between big data and KM have limited scope. There is a scope for testing this linkage empirically in other sectors to understand its effectiveness in other industries.

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Using Flexibility in Designing CRM Solution

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Abstract

The role of flexibility is eminent in design of a CRM solution. But the challenge is how to embed it. We must know where exactly to apply it. We started with investigating critical features of a CRM solution and ranked them in the order of importance. Our research also identified that two sets of flexibility will affect the CRM design- the flexibility of CRM process and the modules therein and, the flexibility of CRM design and its users. Basis this and our ranking, we mapped the flexibility of each CRM feature on a scale between flexibility and rigidity. Features high on flexibility were prescribed to stretch and those were low advised to control or divest, using the two sets of flexibility. For example, where flexibility of the CRM design and the users- both are high, stretch to the extent possible to include applications that will be required now or in future. Where flexibility is low for both, control by divesting the un-required. To help this process of building flexibility, we defined CRM-flexibility continuum that discuss four set of activities. Finding out what sort of flexibility will be important in moving towards business value, listing roadblocks in its way that can reduce it or push it toward rigidity, and then planning to eliminate these to move towards achieving total flexibility.Thus, an organization may choose its CRM solution based on evaluation of flexibility- the ability to customize (its process-flow) and ability to stretch (its modules), the ability to self-control (its design) and ability of its user to control (design)- to meet current and future business requirements, without causing disruption in business continuity and the profitability.

Keywords: CRM, Flexibility, Design, Users, Process, Module, CRM Scoping

1. Introduction

CRM is *deus ex machina* for its ability to track and monitor, and provide the solution to almost every customer issue that a modern organization faces today. From prospecting to customer onboarding, from after-sales to cross-sell- it can do *n* things managing customers for profits. All you need is define the output you want. However, we know, certain logics must be pre-configured into the CRM for it to process the customized output. Therefore, it is imperative that the CRM solution architecture should be designed with flexibility to embed customizations. A business seems favorable today may change tomorrow. In that case, CRM might also require change in its configuration as well. But what if your system does not have this scope to accommodate changes. You have not provisioned for this situation when designing the CRM and now you are caught up in a situation where on one hand are the investments (time*cost) you made in choosing and implementing the CRM solution, and on the other hand, your people who do not find it useful anymore. That's how the best of the CRM systems collapse. Either they are not

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provisioned for future needs that may arise during business (like a regulation change or an internal policy change) or they are very rigidly focused on meeting the present business expectations. This shows how important flexibility is in designing the CRM.

Flexibility is the elasticity to stretch beyond a set traditional boundary. For example, CRM users outgrow in numbers from *x* to *y* over a period of *t* years. If the existing CRM system does not have provision for adding *y* users, it would fail. Consider another example, you have added a new product line to your business, but your CRM can accommodate up to only *x* products. What would you do? One more example, you want to start a self-service customer portal but that can allow only *x* customers to use the facility at one point of time while you have *2x* customers waiting to get into the facility. Can you afford to lose the customers who could not be logged-into the service portal due to your existing CRM limitation? Lack of flexibility can fail the CRM system miserably. So, we should ask- how can we use flexibility to knock-off our chances of failing and, at the same time optimize our growth by transitioning smoothly into the future.

To deploy flexibility,we must decipher first the traits of a flexible CRM. We began with asking- How can I know if a CRM is flexible or not? Does it offer the flexibility our business needs? Two views are offered in this direction. First is, looking at different decision points that have different requirements classified into strategic, tactical and operational CRM. Second is, customization requirements as organization grows in the size (Steel et al., 2014). We have tried to consolidate them in two sets for better understanding.

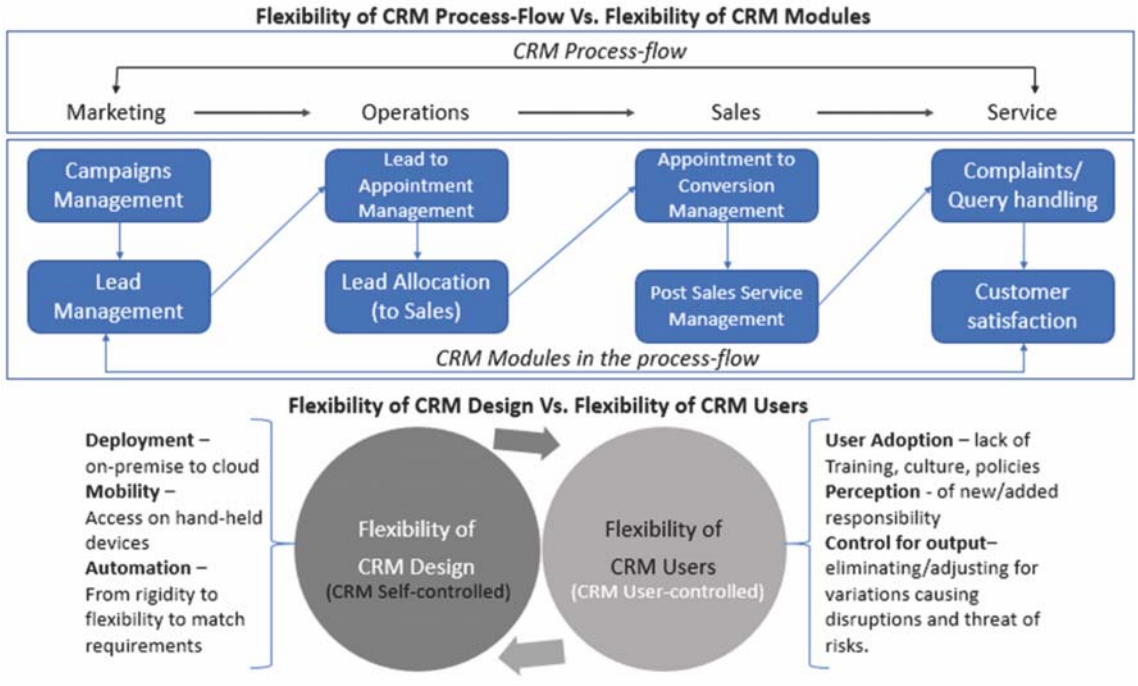


Figure 1: Designing Flexible CRM

According to our research, there are two sets to look at it. The first set is **'flexibility of the CRM process' versus 'flexibility of the modules design'** (or flexibility of the design of the modules). The second set- which is relatively more noteworthy is- **'flexibility of the CRM design versus flexibility of the CRM users'**. The model representation is presented in figure 1 and is subsequently discussed in the sections below. This matches the concept of flexibility as defined by Volberda (1996) that- flexibility is an interactive process between elements of 'organizationalsystem' and 'business environment' (Bamel et al., 2013), and whose determinants are 'managerial capabilities' and'controllability of design' for responding and adapting to change. Flexibility, in fact,as a conceptis theoutcome of interaction between these two properties of control in balance.

2. The First Set: Flexibility of CRM Process Vs. Flexibility of Modules

Most CRM vendors sell their proprietary software platform that typically has an inbuilt process (CRM flow) designed structurally (Ahn et al., 2003), and the modules therein that are customizable (like campaigns and lead management for Marketing, customer service for Operations, account management for Sales). These modules are customized to tackle specific business requirements for example e-commerce CRM and Social CRM as they get more specialized (Chen and Vargo, 2013). This will need varying degrees of flexibility for each module to customize, depending upon the infrastructure stack, system configurations, number of integrations required, hierarchy layers, number of users and data-size capabilities (of server) to name a few. Compared to these are some CRM that are fully flexible to offer high-end customization of modules. They offer to build your own CRM process-flow using your own set of logic to suit your business needs. Like for example, a business is only into customer service & support and do not have any marketing or sales units. Here, it is futile for this business firm to (dummy) configure marketing and sales process-flow (and their embedded modules) and pay for not using it. Where CRM is flexible, the firm can jump the process-flow, customize it to add or delete unwanted activities/things getting in the way and, move fast towards the business value-chain (Voola and Muthaly, 2005)by understanding economic value for guiding on decisions (Kumar and Reinartz, 2005). Similarly, flexible CRM can help customize the modules say, customize objects from scratch or combine existing, create new application altogether, interoperate from one module to another seamlessly. Such CRM systems are mostly the open-source technologies that are low on costs but high on efforts and complex to implement if developing from scratch. Thus, an organization may choose its CRM solution based on evaluation of flexibility i.e. ability to customize its process-flow and ability to stretch its modules. According to Sushil (2013), the evaluation of available choices in the organizational system andmanagerial capability to pick up or re-generate a more appropriate choice. So, the ability to customize will need evaluation of choices available with organization and will depend upon capability of its people.

CRM users (of each module like Marketing, Sales) give their requirements defining clearly their expectations from CRM and the functionality (process, data-sets, objects and the output usually referred to as dashboard) they want. A project manager gathers these requirements and compiles it. This document is called BRD (Business Requirement Document). Next step is to translate these requirements into FSD (Functional Specification Document). This typically starts with defining input (in the data form) to track and improve a pre-defined output (business metric) that the users desire to achieve. Each module has an input-output relation defined in the Scope of Work (SOW) from where we can get the sense about things it can or can't do. Some metrics in this direction are customer acquisition cost, customer conversion, revenue change per customer, lifetime value, repeat customer, customer churn rate, customer interaction points and frequency (Winer, 2001).Accordingly, the flexibility of CRM design can be known that will help us answer if this CRM will be able to offer the flexibility our business needs.

3. The Second Set: Flexibility of CRM Design vs. Flexibility of CRM Users

CRM solution can be deployed in two ways: on-premise by installing it on the Company server or the cloud-based as aSoftware as a Service (SaaS) model which is comparatively quick and easy to implement and maintain but may have security-based concerns (Hsu and Lin, 2016). In its vanilla product form, CRM offers basic functionalities which may cater to the requirements of an SME but even these Companies will need some sort of customization that may vary from basic to complex customizations. It is often seen that in future the Company's requirement for customization invariably goes high as it matures through the stages of CRM post-implementation (Nguyen, 2007). As the organization ramps up its business adding new product lines or introduces new processes it is going toneed the flexibility to accommodate these changes.

In our opinion two types of flexibility will be needed here-one is 'flexibility of the CRM solution design' (or design) and the other is'flexibility of the CRM user'. CRM that can switch between 'on-premise' to 'cloud-based'model is an example of flexibility of CRM solution. A firm may want to cut down on its IT infrastructure costs and decides to go for subscription-based cloud server from the existing on-premise model that was deployed earlier. Flexible CRM will not justbe able to do this switch but also be able to accommodate the migration of existing records saved on its on-premise CRM to the cloud.This will help the firm sustain business continuityby simply allowing CRM to switch without causing data-loss of existing records whichcould affect the users especially the front-office executives. These executives enter data into CRM(the input) that ranges from business transactions toservice requests received from the customerstoggling between pre-and-post sales stages. Such data becomes the premise for middle and senior-level management for monitoring the profitability and decision-making for the future. This can really be critical.

Imagine your customerslog-into their net banking account and learn that their statements of account (historic transaction data) are not being displayed. Why? Becausethese banking transaction records cannot be migrated from bank's existing CRM to thenewly deployed CRM since it is not flexible. Neither it cannot accommodate such large number of records nor it hasthe required number of fields (or data sets) to display the relevant customer informationimportant to staff for service. As customer also if you require snapping between two CRM systems with two sign-ins to access your transaction records; there is a high possibility that you will end your relationship with this bank soon. Hence organizations need flexible CRM that can be deployed anywhere andshould be adaptive to customize as per the business dynamics.Contrary to it, most CRM solutions can align well to the organization's unique business processes but may fail miserably to accommodate changes or expand these processes.

Another example of flexibility of CRM design is about mobility. Flexible CRM usesnative app-based interfaceor simply the webpages made on HTML 5 that can be easily accessed through hand-held devices. It offers great advantages. It improves sales productivity (Kim et al., 2015) by providing prospect and customer leads (appointments) on their mobile devices with all the basic information required to approach them and convert them into business. For example, managing tasks on the go, get updates in real-time, organize sales appointments and other priorities. This has drastically cut down on office costs for organizations since sales staff can work remotely using CRM as single application. For sales, it means spending more time on planning and meeting leads and, maximizing their chances to accomplish sales targets. Some solutions even work offline as well which is especially important for locations where internet connection is weak or negligibly available. A salesperson might visit a customer location that has no or little internet connectivity. In such cases, flexible CRM lets the sales staff to still enter (update) the data and complete the transaction. As and when connection is restored (or when salesman come out of this customer's/meeting location) the offline transaction gets synced with CRM.

Our research identified and evaluated such six strategic features that can be attributed to the flexibility of CRM design, to help us understand the use of flexibility in its design further. We call it 'CRM scoping'. This is presented in the section below but before moving onto it, we would want to know the concept of flexibility of the CRM users.

In situations where a CRM design might require user intervention repeatedly for its working, we attribute it to the 'flexibility of the CRM users'. The biggest challenge in implementing CRM is user adoption (Jaber and Simkin, 2017). Failure in user adoption mainly arises due to reasons like lack of customer centricity in CRM design that does not add any value to either customers or users and rather makes the process complex and long. Some other reasons are lack of staff-training, user's perception of CRM as an additional task than a tool to become efficient at work, and the fear of change- mostly the behavioural issues (Frow et al., 2011; Pedron et al., 2017) which are also classified as and classical and contemporary issues (Awasthi et al., 2014). However, most compelling reason is not being flexible enough to accommodate the changes user want as they evolve in organizational processes and structures to encash new opportunity or improve an ailing business situation. User's flexibility of CRM can help dealing with these challenges. By being flexible, users can control (for variations and) the output better. Where flexibility of CRM design has been leveraged fully; competitive advantage will come from the flexibility of the CRM users.

A business firm may decide to make its CRM scalable using the flexibility of the CRM design. However, this scalability is possible up to a certain extent using different combinations of flexibility (from highly-rigid to fully-flexible). When scaling-up further is exhaustive and constrained by the flexibility of design; the next level of scaling-up will come from the flexibility of users- how CRM users plan to exercise their flexibility. For example, user may cut down on efforts to accommodate all customer data and take only relevant data into the CRM system and control data usage and data space on server. Another user may add only limited data sets/fields for newly introduced product line that he thinks will be enough for MIS generation and controls data from cluttering. A user may limit or restrict the data access for other teams from viewing this new product-line/ customer data thus controlling the information- sharing. Thus, different users may scale-up the CRM system by controlling for relevant or desired output at their levels/hierarchy. Thus, user's flexibility can help adapt CRM to business changes, track progress against set metrics like optimizing the sales cycle from appointment to transaction, make changes in current business process, streamline them, capture the critical data for productive decision-making and to predict customer behavior, and finally improving the reporting.

We can, therefore, remark that the flexibility of the CRM design is provisioned chiefly to self-adjust/self-regulate and auto-correct once defined logically, deploying some technologies, to control output. Contrary to it, the flexibility of the CRM users controls the output directly to alter the (flow/mode of) output as per the user's need and not necessarily the need of the business.

4. Scoping for CRM Flexibility

Our preliminary investigation conducted with 90 CRM practitioners we connected through a professional networking site LinkedIn helped us compile the list of important features in the CRM design from most important to least. We gathered a list of 17 features from a total of 59 respondents (i.e. 65% response rate) that we consolidated into 6 removing vague, unrelated and unclear entries. We then used frequency method to define their propensity in the order of most important to least. Next, we asked these respondents and few more practitioners we added to our network to rate each feature on a scale of 1 (least important) to 5 (most important). Basis this, we calculated the score for each feature- out of a maximum score of 30- for 147 responses received out of 201 contacted (73% response rate). Scores thus obtained were converted into

percentage-based ranking (to compare with the previous ranking). A post-survey ranking of features was compiled to look out for any deviation in respondents' opinion w.r.t to the original or the first ranking.

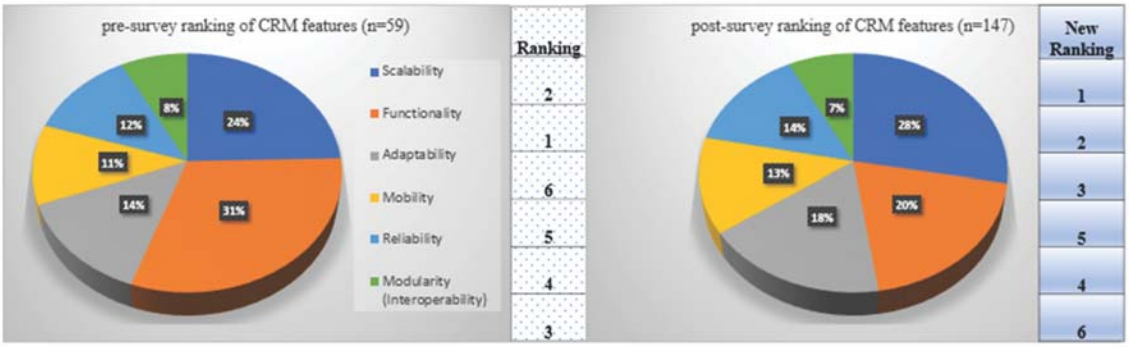


Figure 2: Ranking Order of CRM Features

Though we did not find large deviation in responses, the ranking of some features was now altered. For instance, in new ranking 'functionality' was swapped with 'scalability' so it slipped from most-important feature to second-most important in the ranking. Most severely affected was 'modularity' that dropped to least-important only to be replaced by 'adaptability' at the third rank. 'Reliability' and 'mobility' were the only consistent features- ranked fourth and fifth respectively. This is presented in figure 2.

Our objective by conducting this dipstick was to know the top-rated CRM features by the practitioners to include them for our research further. Unearthing these features will help in the process called 'CRM scoping'. In fact, these features will serve as 'parameters' for defining the scope for an ideal CRM solutiondesign and save the implementation from bloating.

CRM scoping is done when preparing the BRD (Business Requirement Document). It covers all the functional aspects that CRM is expected to do (how it will solve department challenges for e.g. marketing needs to know how many leads were converted into customers and similarly sales will be interested in calculating how much revenue per product per customer on an average can contribute to their targets). But many times, CRM system is designed basis the present situation facing the organization and it does not anticipate requirements that might appear in future. Not even the immediate ones. That is where the rigidity seeps in. We call it CRM myopia where CRM is designed to solve immediate problems but often not the root-cause. For example, requirement of a Lead Management System (LMS) for increasing the new customer inflow as a strategy to counter the churning and hence failing to overlook the real cause of 'customer churn' which may be due to poor servicing or staff training issues like inability to troubleshoot. We prescribe CRM scoping hence must include flexibility to identify what things would be needed in the future. Each parameter used for scoping is to be mapped on flexibility continuum. Accordingly, the CRM design will be checked for consistency.

The process of scoping starts with asking-what are we trying to solve? For example, a business firmmay want to scale further to accommodate more customers or new product lines to its existing CRM. Add a new functionality or delete an existing. Align its processes to adapt quickly to a future business change. Need mobility for its diverse teams and remote offices or simply want a single reliable tool to track everything (leads, appointments, conversions, dropped leads, business transaction, revenue and targets etc.) at one place. Evaluating the strength of these

features (or the parameters) will help this firm know how critical some features are compared to the others, to solve its respective business challenges. So, let's say if this firm is facing the challenge to accommodate newly launched product-line (which includes its customers, sales data), it will need the flexibility to scale-up and adjust to its existing value chain without causing any disruption in the current operations funnel.But how much flexibility will be neededmust be known before-hand. For example, in this case, scaling-up can happen in two ways- one is to provide flexibilityin CRM for anticipated changes for an estimated future period to accommodate expansion (or downsizing) plans. Second, is to have flexibility of open APIs (Application Programming Interface) for integration with different applications that are being used or will be used by the firm now or in future. Both ways will be required as the part of scaling-up in CRM.

Similarly, flexibility of other features like functionality, mobility, modularity, adaptability, and reliability will be important in evaluation of scaling-up. Each feature will have some sort of inter-dependence on other features. Thus, in our example above, scaling-up will need not only the 'flexibility of its own' but also analyzing the 'flexibility of other' features. Clearly, the firm should evaluate the role of other features as well in scaling-up. It should ask- can we scale-up by providing mobility to sales team or by adding-up more functionality in CRMfor improving MIS efficiency for decision-making rather only introducing new data sets or fields in our CRM for scaling up for this upcoming new product line. Thus, mapping flexibility will ultimately shape the CRM design for this firm. See figure 3 for visual representation.

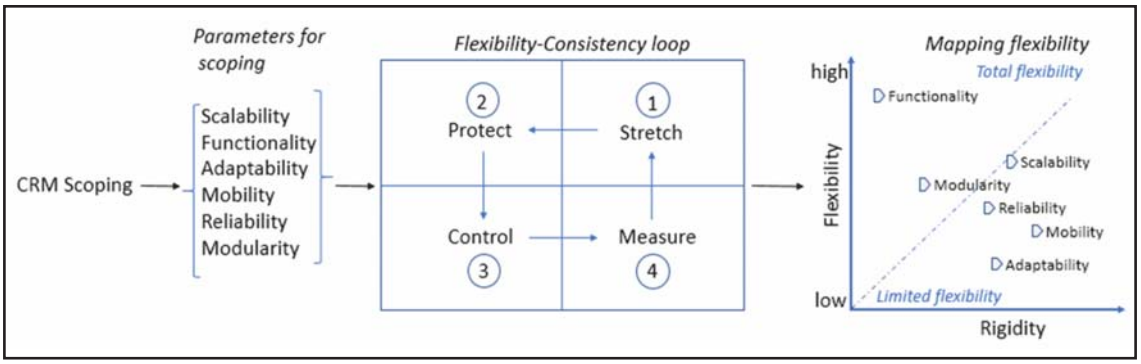


Figure 3: Model for CRM Scoping & Mapping Flexibility

This is how flexibility can play critical role in defining the scope of CRM and engineering its design. It evaluates the strength of the CRM features based on their ability to stretch (i.e. flexibility), sustenance of this ability to stretch, ability to control variations caused by other/ overlapping CRM features. We call this process- flexibility-consistency loop- to gauge how much flexibility will be required for consistency in (features contributing to) CRM design where consistency is the ability to stretch and control output without causing adverse or undesirable disruption in existing process.

After mapping the flexibility of each CRM feature, we can now plot them on flexibility-consistency loop. The flexibility-consistency loop is in the centre as shown in figure 4. It suggests how much each feature can be stretched (added/modified), protected (for minimum stretch it can do or have done in the past), controlled(through self-control or user-defined control)andmeasured(if the output is in line with what was perceived when the system was being stretched for). For example, in our research we find that 'functionality'will require higher flexibility in comparison to other CRM features for flexible CRM design. It means there can be more functions (features)

that the organization may require/intend to add in future hence it should keep this part most flexible (and open for API integration) than other features like 'adaptability' and 'mobility' which require less or limited flexibility. Similarly, the next competitive advantage in designing flexible CRM will come from 'scalability'. As these features move from highly flexible to rigidity, the consistency of feature starts to come down. We advise as they start to cross the baseline between flexibility to rigidity, like 'modularity' and 'reliability' here, they must be protected for sustaining their performance. For those who have reached or about to reach the bottom shifting continuously towards the rigidity, they should be controlledfrom deteriorating further and improved for flexibility. If due to any reason those features can't be improved, they should be dropped off or removed from the priority for the CRM design. This protection and control will come from the flexibility of the CRM design and the flexibility of the CRM users.When CRM is programmed to self-design we call it flexibility of CRM design. When CRM is required to be controlled at different steps by its users we call it flexibility of CRM users. *Figure 4* illustrates these two strategic scenarios. When both- the flexibility of CRM users and the flexibility of CRM design- is high, it is advisable to scale the design to meet as many diverse needs as possible. Similarly, when both are low, control the design by divesting the un-required features for the time being.

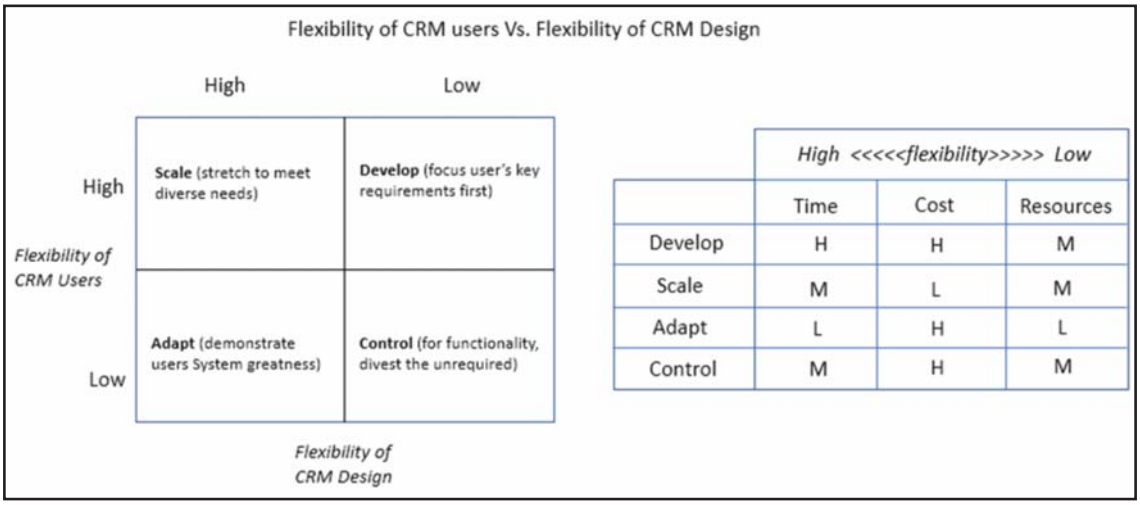


Figure 4: Flexibility-based CRM Design Matrix

This matrix also helps us in understanding what should you do when flexibility of CRM users is higher than flexibility of CRM design: focus on user's key requirements first. In the opposite scenario, design CRM to suit the adoption. Basis this matrix, further you can find out how much time, cost and resource (scope) flexibility will be required in the assessment of every CRM feature. For example, higher *time* and *cost* flexibility will be needed in developing the CRM basis the inputs given by its users and the experience of its designers.

5. Building Flexibility

Now that we know from our discussion above the importance of flexibility in CRM design, its traits and types and the practice of mapping it and,how CRM managers can strategically use this knowledge in designing CRM vis-à-vis to the organization's scope of work. What we yet haven't spoken about is how to build this flexibility. Is there a way to endorse it? After, we have known the critical CRM features (like CRM functionalities) and the amount of flexibility each feature need (very-high flexibility as in our research) in arranging them in design;next we would want to know how can we build this flexibility.

We evaluated and prescribed two sets of flexibility as ways do it- the flexibility of CRM the process and the modules and the flexibility of the CRM design and the users. It requires matching users' expectations to designer's abilityusing flexibility. It's like matching efficiency to flexibility (Adler et al., 1999). In nutshell, how much flexibility CRM users and, designers demand to suit business requirements? Is there a consensus on it? Figure 4 will helpus decode it through what is called flexibility contnuum. It is a scale to segregate the activities that will help build flexibility ranging from most important to least. On one end is 'go-forth' which lists down the must-do activities that are highly important in increasing flexibility to help the business move towards value fast. On the other hand, is 'let-go' that lists down that activities that are mostly the un-important, not a priority, not possible right now or time-consuming. However, word of caution- applying the choice located on either of theextreme-sides can be disastrous for business (Sushil, 1997).

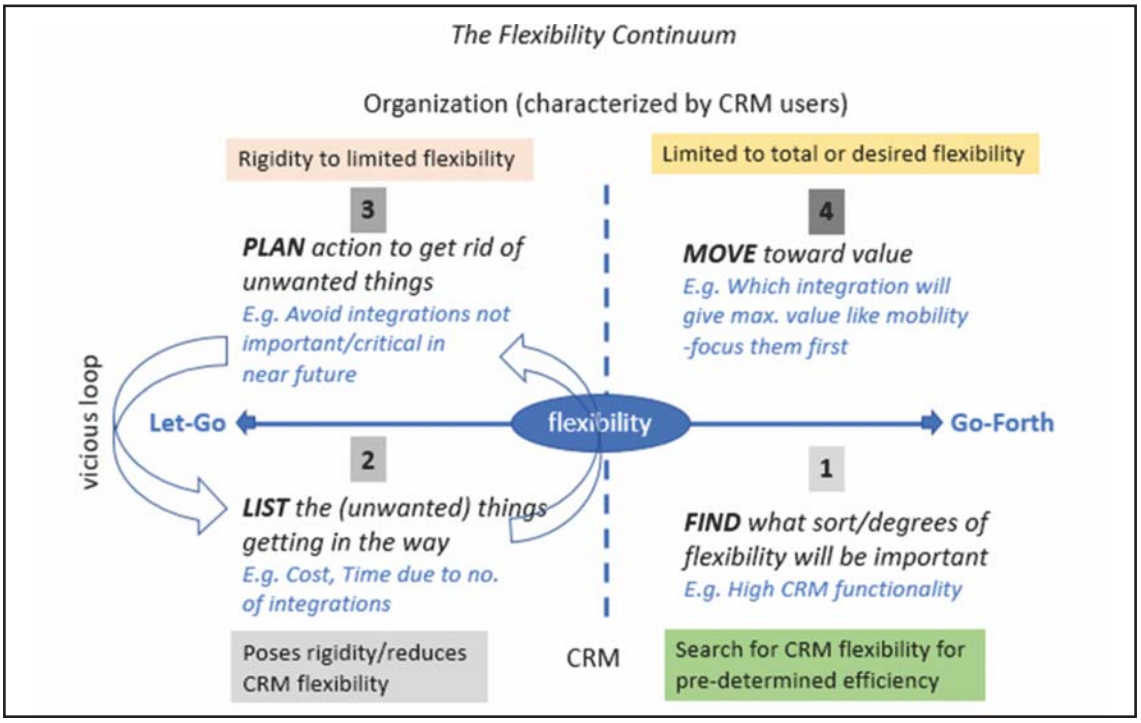


Figure 4: The Flexibility-CRM Continuum

Once it is known that which feature (like functionality in figure 3) needs the highest order of flexibility we can then look forward to sorting out what things are getting in its way. Like cost, time, number of integrations required, inbuilt CRM capability etc. We try to uncover the factors that refrain us from allowing flexibility for greater control like- integrations that depend upon the third party and are time-consuming and not very critical in near future. It is from here we move towards higher flexibility that is required by us by divesting un-important activities associated with this feature and focus on critical ones to leverage its potential for robust CRM design. It is mostly seen that CRM designers often get caught up in vicious loop of *stages 2* and *3*. The unwanted things keep on coming into their foresight and they get busy in planning for getting rid of them. Beware not to end up being into this swirl. Important is plan action to get rid of unwanted things and move towards value by focusing on them first. For example, which integration will add maximum value- focus on them first- say, mobility. CRM users can use find, list, plan

and move stages to reduce if not eliminate the obstacles coming in way of building flexibility. So, let's say, once you find out that functionality is the most strategic feature in all (using flexibility mapping process), you list what things are posing rigidity and, working against flexibility of this feature. Plan activities to get rid of things causing rigidity by focusing on activities that will add greater value to the CRM design. Similarly, all features can be evaluated using the flexibility continuum process. This will help CRM managers to plan for building flexibility matching the users' and the designers' expectations as basis for CRM design.

6. Concluding Observations

The role of flexibility is eminent in design of a CRM solution. But the challenge is how to embed it. We must know where exactly to apply it. We started with investigating critical features of a CRM solution and ranked them in the order of importance. Our research also identified that two sets of flexibility will affect the CRM design- the flexibility of CRM process and the modules therein and, the flexibility of CRM design and its users. Basis this and our ranking, we mapped the flexibility of each CRM feature on a scale between flexibility and rigidity. Features high on flexibility were prescribed to stretch and those were low advised to control or divest, using the two sets of flexibility. For example, where flexibility of the CRM design and the users-both are high, stretch to the extent possible to include applications that will be required now or in future. Where flexibility is low for both, control by divesting the un-required. To help this process of building flexibility, we defined CRM-flexibility continuum that discuss four set of activities. Finding out what sort of flexibility will be important in moving towards business value, listing roadblocks in its way that can reduce it or push it toward rigidity, and then planning to eliminate these to move towards achieving total flexibility. Thus, an organization may choose its CRM solution based on evaluation of flexibility- the ability to customize (its process-flow) and ability to stretch (its modules), the ability to self-control (its design) and ability of its user to control (design)- to meet current and future business requirements, without causing disruption in business continuity and the profitability.

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Proceedings of GLOGIFT 17
December 11-13, 2017
Delhi School of Management, Delhi Technological University, Delhi
pp. 686-690

Flexible Management through Secure Digital India Initiative of the Government

Archana B Saxena[1] and Sanjive Saxena[2]

Introduction

Digital India, an initiative launched by the government of India with the intention to transform India and link the country with the digital empowerment of society and knowledge-based economy [www.digitalindia.gov.in]. This program, which is more than lakh crore has three major targets *viz.* Digital Infrastructure for every citizen which will provide several utility services of the government, promotional of Digital literacy to next level and provision seamless integration across several departments across many jurisdictions with information and communication technology forming the backbone [Lakshmi, Vijayalakshmi, and Ugrappa. (2016)]. The e-education, e-health, e-sign are some of the schemes launched under this initiative whereas UMANG (Governance), UDAAN (Unemployment in J&K), SWAYAM(students), SWATCH BHARAT (Cleanliness), SUGAMAYA PUSTKALYA (online Library), SARANSH (CBSE affiliated schools) are the services. [www.digitalindia.gov.in].

In order to ensure that this initiative is successfully implemented, the fundamental requirements must be put in place first. These include a strong and robust Information Technology infrastructure, provision for storing large amount of data which would be generated from the various operations and services of this initiative and above all it requires a sustainable training, education and awareness program to ensure that rural and urban citizens are able to adopt the benefits of being Digitally empowered efficiently and effectively. Cloud computing, a relatively new technology, provides requisite infrastructure along with the added benefits of cost savings to make Digital India, a dream come true. For, Cloud computing, operates on the backbone of Internet and thereby links several Data Centers of the government departments and integrates them by network resource centers. In essence, Cloud computing has three major components:1. Infrastructure as a service, 2. Platform as a Service and 3. Software as a Service. These are commonly abbreviated as IAAS, PAAS, and SAAS. The word *service* denotes the concept of pay per use structure. In other words, the customer pays to the cloud service provider the amountof money for the time which he uses. He is not required to incur extra cost on hardware-software or on the maintenance or any other cost such as licensing and procurement. According to E-tech India summit, (2015) the incorporation of appropriate encryption technology, Cloud Computing will be the next step in integrating the country for Digitalization [www.indiatvnews.com].

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Necessity and contribution of Cloud Computing in the success of Digital India scheme are well registered but security lapse and data leakage form cloud is raising few questions that must be answered before commonalities will adopt this scheme without any apprehension. Worth mentioning a recent data security lapse, where an IIT graduated student is arrested for unauthorized access of "Aadhar card database", one of the important components of "Digital India" scheme [Johnson (2017)]. With such incidents it quite obvious to have reluctances among service consumers towards "Digital India" schemes and services. Various queries related to availability, integrity, and security of data goes around in customer's cognizance. Who is responsible for the security of data or information saved under schemes or services launched by Digital India notion? What efforts is the government taking to ensure the security of data? Is there anything we can do to save our data and much more?

All this boils down to the basic concept of "***flexible Management of stakeholders***" in the digital India campaign. This paper is thus an attempt to address some of the apprehensions through our current paper by accumulating issues that can affect IAAS security and impact security of data saved in "Digital India" scheme, measures that can be used to control security lapse. Digital India scheme has various stakeholders like Government, Service Provider, Service Consumer. Authors have a perception that security cannot be ensured through one but it should be a contributed effort by all stakeholders. Keeping this in mind responsibilities are defined for stakeholders they should be responsible to implement defined security measure and hence contribute in taking "Digital India" a step ahead.

Keywords: Cloud Computing, Cloud Security, Cloud Stakeholders, Digital India Security, Flexible Management

Research Gap and Research Problem: From above discussion, it is evident that IAAS of cloud computing is considered as the base and must ingredient for smooth functioning of Digital India and it is thus required to managed flexibly. Any challenges faced by this technology will directly impact working of this government scheme. A lot of discussion has been carried out by researcher across the globe related to Cloud Computing and Digital India management, such as:

Lakshmi, Vijayalakshmi, and Ugrappa (2016) has covered "Digital India" in details like information about program, services, schemes, budget, and beneficiaries of the program. A good coverage of mission, methodologies, impach and relation with E-governance are also highlighted in the paper.

Ganeshkumar and Ramesh (2017) have proved through data collection and analysis that cloud services can be useful in supporting "Digital India" schemes. They have used various techniques like k-means, clustering and regression algorithms to analyze twitter data and give recommendations.

Siwach, Jyoti and Amit Kumar (2015) have referred Digital India as dream project for government of India and explained how digital innovation can have positive impact on lives of urban and rural population. They have also emphasis on the challenges faced by this dream project.

Modi, Chirag (2013) have explained challenges faced by different layers of cloud and impacting its adoption among commonalities. They have also enlist the measures that can be used to enhance privacy and security of cloud.

Kaufman, Lori M (2009) have discussed need and measure to ensure data security in the cloud. The impact of security on trust is also dicuused in the detail.

Ramgovind, Sumant, Mariki M. Eloff, and Elme Smith [2010] have kept an aim to provide overall security to cloud computing and to achieve this aim they have discussed joint responsibilities in ensuring security in the cloud.

In this paper we develop following research problem to address flexible management in the digital India campaign and try to address the various issues related to it:

a. The degree and extent to which Digital India is secure with respect to its various operations pertaining to stakeholders.

b. The degree and extent to which Government, Service Provider and Service Consumer realize their responsibilities in securing "digital India" campaign and implement flexible management controls.

Although the sound literature has found related to "Cloud Security" and "Digital India", still following gaps have been identified in the literature:

a. There is no discussion about Security issues of cloud computing that can directly impact "Digital India" notion and hence they must be managed

b. What measures can be used to ensure the security of data or information saved on cloud and finally ensuring secure transactions in digital India? In other words flexible management by using these measures

c. Who is responsible to ensure the security of data or information saved in the cloud under "Digital India" scheme? Again, a management issue which can be implemented flexibly.

Objectives of the study: To bridge the gaps identified in literature author have kept a few fold objectives for this paper:

a. Security threats of IAAS that can impact "Digital India" Schemes and Services.

b. Measures that can be used to overcome above mentioned challenges/threats.

c. Generating a task list to implement security measures.

d. Segregating task list between stakeholders and Defining of responsibilities of each one to implement secure "Digital India" scheme.By achieving above mentioned objective authors are trying to achieve the prime objective: making "Digital India" a secure practice and contribute in nation development through digitization empowerment.

Research Methodology

In order to achieve mentioned objectives, initially, authors have defined the scope of the study, by selecting cloud service that can be a support for "Digital India" operations. So, the scope of our study is related to IAAS service of the cloud.

Once domain pertaining to the study is defined then author have followed a structured approach to the development of this paper. To define the challenges of IAAS that will impact "Digital India", data is collected through primary and secondary means. For secondary data collection: the internet, online newspapers, journal, research paper are used. Primary data is collected through structured questionnaire. Few samples are collected online from IAAS users. Collected samples are filtered, verified and validated before analysis in excel. After finalizing the issues that can impact IAAS security. The next step is to finalize, "Security Measures" to resolve above-mentioned issues. This chore is accomplished through literature survey, discussion with SME (Subject Matter Experts) and authors own knowledge about the topic. Once security measures are identified then task list is concluded to implement these measures and finally responsibilities are segregated between stakeholders to implement defined task in order to ensure security.

Findings of the Study

Findings will present a list of IAAS security challenges that can impact "Digital India" schemes and services. Another list that is pertaining to study is the list of measures that can be used to control or avoid security lapses like Certifications, standards, and technical update that ensures security coverage at IAAS. Once the security measures are identified then task list is created to implement these security measures. Ex: ISO/IEC 27002 for proper protection of data or information, strict authentication, and authorization mechanisms for data access and modification, strict rules and laws pertaining to cyber security, and much more. These tasks/ responsibilities are further segregated among stake holders [Government, Service Provider, and consumers] and make them accountable for these chores and request them to contribute in security project.

Implications of the Study

World Bank predicts that with success of "Digital India" country will be a third largest economy in next 10 years [Johnson, (2017)]. As an IT professional and researcher, it is our moral responsibility to contribute to literature to convert World Bank's prediction into realism. Our study contributes to the literature, various responsibilities that each stakeholder should carry out to ensure the security of data and information saved on cloud and hence protected "Digital India" scheme. An implementation with the right approach and existing literature our study can contribute in following ways:

a. "Digital Literacy": Secure and comfortable services will lure every citizen and masses will accept it.

b. "Digital Empowerment": Secure IT infrastructure will boost up digitization of all government departments and jurisdiction.

c. Secured IAAS service can distribute IT infrastructure among masses without huge investment and security apprehension.

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Understanding Public Value of a Few e-governance Projects in India

Parul Jain Gupta[1] and P.K.Suri[2]

Abstract

E-governance is a growing phenomenon aimed at providing efficient public service delivery to citizens across nations. A few of the developed nations had implemented e-governance initiatives successfully though, others are still striving towards it. The technological advancement has enabled public organisations to offer public services in a digital and virtual manner. However, various e-governance projects still require physical presence of citizens at the time of service delivery. Compared to fully computerised projects, in such projects citizens are expected to incur more cost, spend more time and put extra efforts to avail services. Therefore, we studied a few such e-governance projects in India to analyse their public value measurement and to identify variables which may be influencing public value of such projects. In this respect, we have used Situation-Actor-Process (S-A-P) framework to understand the situation, actors and process of these projects.

Keywords: E-governance, E-government, Public value of e-governance projects, SAP-LAP.

Introduction

Advantages of e-governance are well-known to the various governments across the globe. In the past few years, its reach has also increased with the effective use of Information and Communication Technology (ICT). While developed countries are among the performers, developing countries are still striving towards digitization of public service delivery. Information Technology (IT) was introduced in India in 1998 for the improvement of efficiency of government departments. Departments were asked to invest 2 to 3 percent of the total budget into IT (Planning Commission, 1997-02). However, expected results could not be achieved due to the isolated efforts by various departments. Service delivery at government departments was still not transparent due to the discretion involved at every level and lack of user friendliness (Planning Commission, 2002-03). Therefore, government realized the requirement for National e-Governance Plan (NeGP). NeGP was approved in 2006 comprising 31 Mission Mode Projects (MMPs). Further, in 2015, Digital India Programme was introduced by government with the objective to transform India into digitally empowered society and knowledge economy (www.meity.gov.in). Digital India Programme has mainly three vision areas, viz. digital empowerment of citizens, digital infrastructure as a utility to every citizen and governance and services on demand. Under this programme, NeGP has also been re-designed and re-named as e-Kranti. Objective of e-Kranti is to improve government services with the use of digitization at a lowest cost. The number of MMPs under e-Kranti has also been increased to 44 regarded as as Central, State and Integrated Projects.

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Governments put efforts to offer benefits to citizens with respect to digitization of information, e-participation, transparency, etc. through e-governance. With the successful implementation of e-governance, public organizations are able to provide improved services to citizens. It further helps to strengthen the relationship between public organisations and citizens. Value created by public organizations for citizens is also known as public value. It is a well-known concept which is used to evaluate the performance of public services (Moore, 1995). Public value is the outcome of services, laws, regulations and other actions of government (Kelly, 2002). In different words, performance of public organizations can be measured through public value. Therefore, public organisations should focus to create more and more public value (Harrison et al., 2011). Services offered by governments are mainly citizens' oriented thus performance of public organizations should also be measured from the perspective of citizens. Hence, governments are expected to measure the performance of public organisations by adopting the concept of public value (Karunasena et al., 2011).

Many studies have been conducted to measure the performance of government portals or electronic services (Yang et al., 2005; Kim et al., 2006; Golubeva, 2007; Bidyarthi and Srivastava, 2011; Bhattacharya et al., 2012) however, in developing countries like India, e-governance is still at emerging stage therefore, all public services are not available on websites completely. As per present scenario, to avail many public services such as passport, driving license, registration of property, etc. citizens are still required to visit the public organisations. A citizen at the time of his visit to a public service centre faces a situation with respect to sitting space, availability of drinking water, cleanliness, queues to avail services, etc. He/She also deals with employees and observes a few parameters such as their willingness to do the work, speed to complete the work, knowledge level, communication skills, etc. Further, a citizen during service delivery also goes through a process and experiences process flexibility, continuity, easiness, convenience, etc. Hence, it is expected that based on 'Situation', 'Actor' and 'Process' (S-A-P) related variables (Sushil, 2000), citizens form a perception with respect to service delivery which is conceptualized to influence public value of the organisation.

The objectives of study are:

- To analyse public value measurement of a few public services with the requirement of citizens' presence
- To present conceptual framework of public value measurement based on S-A-P related variables

Methodology

To get insights about public value, a literature review was conducted with respect to its measurement. During the literature review, a few studies those have evaluated public value of government websites/portals were maintained separately as aim of the present study was to focus on the projects where citizens are required to visit the service centres. Further, a few e-governance projects were selected for profound study in the study context. Selection of projects was executed after understanding the process of their service delivery, visiting their websites and studying their annual reports and manuals available on the websites. It was also kept into consideration that the projects selected for the study should have completed at least one year of operation and should be citizens' centric in nature along with mandatory requirement of citizens' presence at the time of service delivery.

A SAP-LAP framework (Sushil, 2000) has been used in the study as it is conceptualized in the study context that SAP related variables are expected to influence public value of e-governance projects. Unlike any management context, service centres of public organizations also consist

of a 'situation' to be managed, an 'actor' or a group of actors to deal with the situation and a 'process' or a set of processes that respond to the situation and recreate it. SAP-LAP framework is generic in nature and has been used in various areas such as technology management, supply chain management, resource management, etc. (Garg and Deshmukh, 2010; Charan, 2012; Chauhan and Singh, 2013; Mangla et al., 2014; Suri, 2017; Gupta and Suri, 2017).

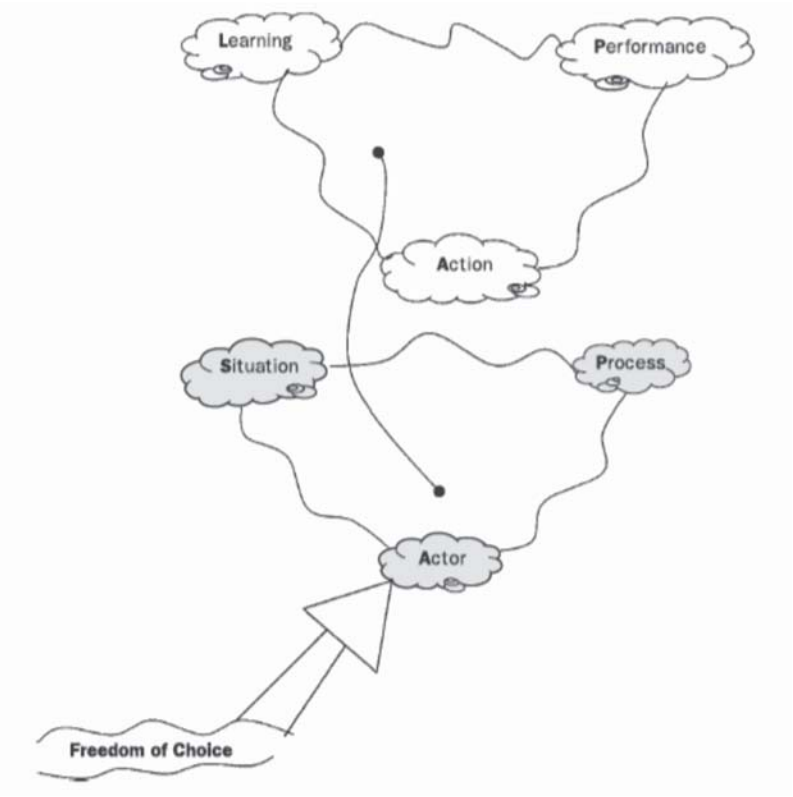


Figure 2: SAP-LAP Framework
(Source: Sushil, 2000)

Literature Review

Public value is the measurement of services at public organizations. There are various sources to evaluate the same such as delivery of quality public services, achievement of outcomes and development of trust (Kelly et al., 2001). It was further examined by Kearns (2004) basis which it can be measured through extent to which information is provided, extent to the use of e-government, availability of options, fairness in service delivery and saving of costs. In the context of developed countries, there are mainly three drivers of public value, viz. efficiency, democracy and effectiveness (European Commission, 2006). An another public value framework measures public value on the basis of services provided by public organizations, satisfaction of users, trust and outcome (Grimsley & Meehan 2007). Measurement of public value of e-governance projects is based on delivery of quality public services, effectiveness of public organizations and achievement of socially desirable outcomes (Karunasena, 2012).

During the literature review it was found that there are many studies which have evaluated websites/portals of services provided by government from the perspective of public value. A

study in the context of Turkish has evaluated websites of sixteen local governments. As per the study, websites usually consider content and quality however, public value perspective is the primary objective of government websites (Karkin, 2014). The study has been divided into total nine categories, out of which three are related to web evaluation matrix .i.e. content, usability and Quality and six are associated with public value, viz. accessibility, citizen engagement, transparency, responsiveness, dialog and balancing of interests (Karkin, 2014)

Another study in the context of India, has presented e-service quality model for Indian government websites from the perspective of citizens (Bhattacharya *et al.*, 2012). The model is guided by two external factors, viz. information quality and system quality and consists of mainly six dimensions:

1. citizen centricity;
2. usability;
3. technical adequacy;
4. security and privacy;
5. transaction transparency; and
6. complete information.

As per a study by Golubeva (2007), major indicators for government portals assessment are openness, transparency, interactivity, citizen-centricity and usability. The study was conducted to measure the influence of e-government by evaluating 11 regional government portals in Russia. Another study of web portals those are source of information for its users were examined to develop a measurement scale of perceived service quality of information (Yang, 2005). The study included commercial portals and non-commercial portals developed by government agencies. Variables related to online transaction were not the part of this study as focus of the selected portals was on providing information only (Yang, 2005). Mainly six quality dimensions have been proposed in the study:

1. usefulness of content;
2. adequacy of information;
3. usability;
4. accessibility:
5. privacy/security; and
6. interaction.

In a study by Verdegem and Verleye (2009), a comprehensive model to measure the user satisfaction by testing five websites of government has presented. This model has mainly nine key indicators, viz. infrastructure, availability, awareness, cost, technical aspects, customer friendliness, security/privacy, content and usability. As per the article, major criticism of e-government strategies is lack of user oriented approach due to which requirement of measuring online government services from the perspective of users is felt (Verdegem and Verleye, 2009).

As mentioned above, many existing studies have measured government websites/web portals to measure the public value from the citizens' perspective. However, in developing countries like India, there are many e-governance projects where citizens are required to visit the public organisations at the time of service delivery. Such services are the part of e-governance initiatives however, these are not completely computerised therefore, citizens either by taking appointment over the phone or through websites are needed to go the service centres to avail the service. A

few such services are registration of marriage, registration of birth for the requirement of birth certificate, requirement of driving license, registration of property, request for conversion of immovable property from leasehold to freehold, request for passport, etc. These services are basic in nature and most of the citizens face requirement of any of the service as mentioned. Such three services have been explained below for the purpose of profound understanding in the study context.

Projects Description

Passport project

In India, passport services are delivered by Central Passport Organization (CPO). It is a division of Central Passport and Visa (CPV) of Ministry of External Affairs (MEA). The ministry hired services of Tata Consultancy Services (TCS) in 2008 for the execution of passport services under Public-Private-Partnership (PPP) mode. The formal launch of the passport project was done in May, 2010. Scope of the project consists of re-engineering of the processes, development of application and website, data migration and communication, infrastructure with regards to setting up of passport offices, increasing printing capacity, setting up call centre, etc. The main objective behind introducing the project was to meet the increasing demand for passports, developing a transparent and easy process for the issuance of passports, building better grievance redressal mechanism, discouraging the role of mediators by building an efficient and reliable system, etc. Passport project is one of the Mission Mode Projects (MMPs) with the network of 77 passport service centres across India.

As per the process of passport service, citizens are required to visit the website, i.e. www.passportindia.gov.in and after registration they are needed to fill up the online application forms. Next step is to make the payment of fee online and book and appointment on the website itself. Then on the said appointment date they have to visit the passport service centre along with their documents.

Driving license project

Driving license is a document which is required to get the certification of eligibility to drive a vehicle as per Motor Vehicles Act, 1988. It is issued by department of transport. Transport department has tied up with Delhi Integrated Multi-Modal Transit System Ltd. (DIMTS) for this purpose. Since July 2007 DIMTS is a joint venture of Government of National Capital Territory of Delhi (GNCTD) and Infrastructure Development Finance Company (IDFC) foundation. Driving license project is a state level project which has been implemented at thirteen zonal transport authorities. Overall scope of the project includes setting up of the centralized data repository, developing an online appointment system, offering e-payment facility, efficient check on issue of multiple licenses, checking the identity of the applicant through biometric, discouraging duplication of data, decreasing the possibility of manipulations, etc. As per the process of driving license application, citizens are required to visit a website, i.e. www.transport.delhigovt.nic.in through which they can fill up the online form and can book the appointment after making payment electronically. There is also a mechanism to book the appointment by calling at a toll free number, viz. 09311900800. The purpose of the new system is to computerized the whole process by minimizing the interference of human to make to process more efficient, transparent and secure. However, after booking of appointments, applicants are needed to go to the driving licence office to avail the services. It is also expected that applicants may have to make multiple visits in case of any documents deficiency.

Conversion of immovable property from leasehold to freehold

Delhi Development Authority (DDA) was established under Delhi Development Act 1957 to support and protect planned development of Delhi. The main branch of DDA is housing department which was started in 1968. The core objective of this department is to meet the housing requirement of the society. Out of the other functions of housing department, one major function is to convert the immovable property from leasehold into freehold. Since 1969, many housing schemes have been launched by DDA however, allotment of all the residential flats prior to 1992 was made on leasehold basis. Objective of DDA to make the allotments on leasehold basis was to keep the rights of property for receiving some recurring income to meet other operational expenses. However, it became difficult for DDA to take over the property on completion of the lease period. Therefore, to avoid increased litigations, in February 1992, it was decided to allow conversion of leasehold property into freehold by execution of conveyance deed.

As per the process, applicants have option to either submit the request online or by visiting to any of the service centre in Delhi. After that their application is received by a diarist who further handovers the file to the dealing assistant. Records at housing department of DDA are still maintained in physical form hence, dealing assistant with the help of record room in charge gets the old file retrieved for further actions. After verifying the documents then it is sent to the accounts officer to calculate the dues. Then a demand letter is sent to the applicant and applicant has to visit the department to clear the dues and submit the receipt of the same. There are also chances that applicant may have to visit multiple times due to requirement of documents or making payment as the existing online mechanism is not in use due to the lack of reliability and lack of fully computerized system. After receiving dues from the applicant file is again sent to the accounts officer to issue the no dues certificate. Then conversion letter and three conversion deed papers are sent to the applicant for the purpose of execution of conveyance deed.

Conceptual research framework

As mentioned above, according to the process of many e-governance projects, citizens are required to be present at the time of service delivery. Though there is facility of filling up the form online, making e-payment and booking of appointment however, on the day of appointment citizens are needed to visit the public organization. During their visit they face a situation, interact with actors and follow a process. It is conceptualised that on the basis of SAP related variables they form perception about service delivery which is expected to have influence on public value of the project. With respect to this conceptual framework is presented below:

As presented above in Figure 2, public value of e-governance projects is measured through ‘Quality Service Delivery’, ‘Competence of Public Organizations’ and ‘Achievement of Socially Required Outcomes’. ‘Quality Service Delivery’ consists of ‘Quality of information’ (Kearns, 2004; Karunasena, 2012), ‘System functioning’, ‘User orientation’ and ‘Cost savings’ (Kearns, 2004). The ‘Competence of Public Organizations’ refers to the perceptions related to ‘Efficiency’, ‘Openness’ and ‘Responsiveness’ about public organizations (Karunasena, 2012). ‘Achievement of Socially Required Outcomes’ comprises ‘Self-development’, ‘Trust’, ‘Equity’, ‘Citizen participation’ and ‘Concern for environment’ (Kearns, 2004; Karunasena, 2012).

SAP related variables as presented in Figure 2 are ‘Improved Situation’, ‘Capability Level of Actors’ and ‘Flexibility of Process Workflow’. ‘Improved Situation’ comprises of “Distance covered to reach the service centre’, ‘Influence of middleman’, ‘Queue to avail services’, ‘Provisions of feedback mechanism’, ‘Seating arrangements’, ‘Air conditioned environment’, ‘Cleanliness’ and availability of ‘Drinking water’ (Agus et al., 2007; DeitY, 2008; Yusoff et al., 2008; Satapathy,

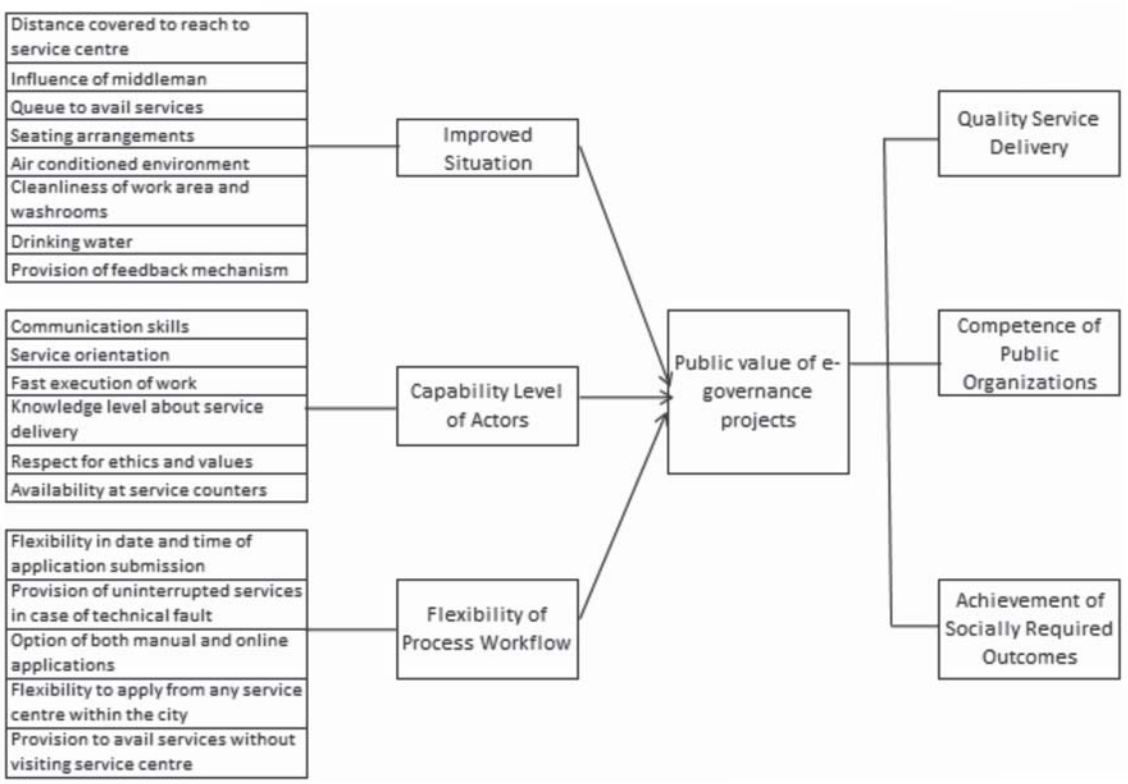


Figure 2: Conceptual Research Framework

2014; Osman et al., 2014). 'Capability Level of Actors' includes 'Communication skills', 'Service orientation of employees', 'Fast execution of work', 'Knowledge level of employees about service delivery', 'Respects for ethics and values' and 'Availability of employees at service counters' (Parasuraman et al., 1988; Cavana et al., 2007; Papadomichelaki and Mentzas, 2012; Bharwani and Jauhari, 2013; Al-Borie and Damanhouri 2013). 'Flexibility of Process Workflow' is measured through 'Flexibility in date and time of application submission', 'Provision of uninterrupted service in case of any technical fault', 'Option of both manual and online applications', 'Flexibility to apply from any service centre within the city' and 'Provision to avail services without visiting to the service centre' (Lovelock, 1983; Parasuraman et al., 1988; Brown, 1990; Kay and Russette, 2000; Bharwani and Jauhari, 2013).

Conclusion

Benefits of e-governance are well known among various governments of the world however, in the context of developing countries, desired advantages have not been reached to the citizens. Hence, assessment of public organizations becomes crucial for government. Many studies in literature have measured public value of government websites whereas in India, to avail many public services citizens are required to visit the public organizations. Therefore, to measure overall public value of such organizations, it is vital to analyse other variables also which may influence perception of citizens about public value at the time of their visit. Such variables have been presented as SAP related variables in the study which are expected to influence public value of such organizations. Based on conceptual framework it is expected that, planners and implementers equipped with this kind of knowledge would focus to improve the situational,

actor and process related factors. This would further help to achieve increased public value of those organizations.

Limitation

The article has presented a conceptual framework which is required to be tested by analysing various projects. It is needed to reach to the generalized findings by validating the proposed framework.

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Augmented Transformational Methodologies for Effective e-Governance

SMMM Kalyan Kumar[1] and S C Pradhan[2]

Abstract

e-Governance is emerging as a basic management tool for sustainable development in public service paradigm. The digital transformation required for this setup can be achieved by flexible usage of selective and adaptive measures. The methods of ICT tethered with providers, consumers, medium and other deployed arenas are acts for effective e-Governance. Also it emphasizes the presence in globalized communities substantiated with active role in technology augmentation and institutionalization.

In that line, this article discusses the stack of technologies in e-Governance with respect to infrastructure, literacy, delivery and security strategies with help of digital scientific paradigms to deal with issues associated with ensuring interoperability and integration across these sectors and handling of rapid proliferation in these domains.

Introduction

E-governance needs clear strategy of addressing the issues and their analysis pertains to the digital unification, infrastructure development, open standards and IT awareness. Governance refers to the system of directing and controlling the actions, policies and functions of an organization, or nation. As it should ensure that the spending of public money to information and communication technology development, control and maintenance activities is done in a transparent, effective and efficient way. Potential of e-governance lies in promoting transparency, accountability, efficiency and citizen engagement in public service delivery. Accountable and inclusive institutions at all levels are possible through advanced electronic and mobile services. Integrated public services like one-stop platforms allow accessing a range of public services. This approach makes it easier for people to interact with public administration and get adequate and holistic responses to their queries and needs. E-governance effectiveness in the delivery of basic economic and social services to people can be improved based on technological augmentation and infrastructure reach.

Government infrastructure[4] spans through at different levels, viz. central, provincial (state), regional and local. Issues for government units exist due to both of heterogeneous resources and legacy applications. Examples of these applications range from better access to information on available services to complete online processing of requests for permits, certificates, payments, issues of privacy and electronic voting, etc. Ensuring to identify the technical solutions for issues with minimal redundancy in service. Rapid advances in technology have allowed more advanced

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equipment and applications. It needs matching tools to cope-up with the vision and dynamically dealing with the issues.

The policy framework[1] of IT activities in governance comes as IT act 2000/08, which in a way grants Egov rights to the citizens of India besides encouraging e-commerce and regulating policies e-Systems. Other laws include there to providing preventive vigilance and penalties to activities with copyright act 1957 and Aadhaar act 2016. Overall, the attempt is to provide a standard legal framework for customers, 3rd parties, business partners, regulators, users and other stakeholders in the context of IT based transactions.

The current government related stakeholders[3] of E-governance are NIC, UIDAI, NeGD, SeMT, State IT wings, CGG, eGCA and District IT cells. The infrastructure spans across as National Information Infrastructure (NII) like National, State and Mini Data centers, connectivity through SWAN, NKN, NICNET, NOFN, SATCOM. Cyber protective agencies like CERT-In, NTRO, IB wing are part of regulative processes. More integrated projects[7] are already in place like MMPs, Megh Raj, CSCs, SDSs through Egov planning of NeGP, NeST and Digital India Platform (DIP).

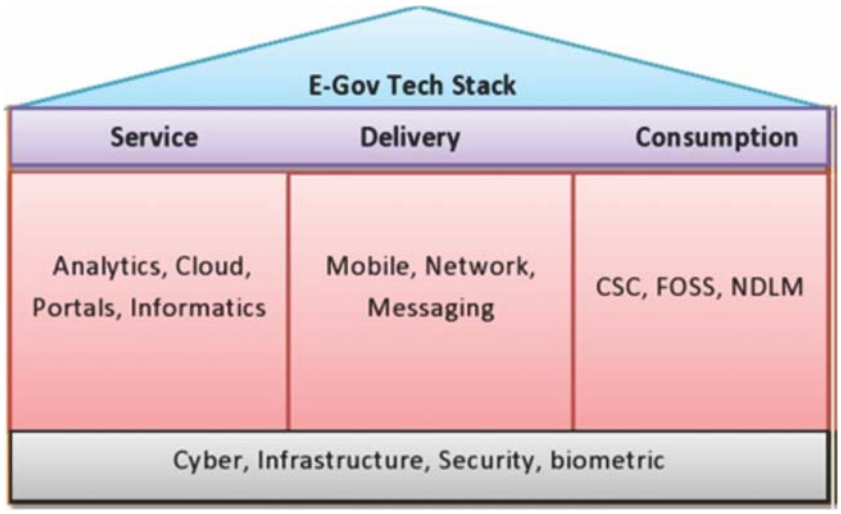


Figure 1: Fragments in Electronic Governance [Own creation]

Transformation Strategies

Various technologies of IT are intricately bounded for e-gov domain. Also standards of governance might dovetail with fast pace of technology changes and aspired goals. Hence, technology updating and isolation requires for selective and adaptive measures. Effective Service, Conductive Delivery Channel and Optimal Consumer societies are allies to the system of E-governance. Technologies for these as depicted in Figure1 are elaborated further.

A. Augmented services

The Egov model of delivery need to deal with diverse and variable set of requirements of citizen centric and other government applications. These applications can be integrated to cloud model for better throughput by incorporating multi-tenancy and orchestration of these services. Various cloud prototypes are there for implementing Egov services like public, private, hybrid model, Infra, platform, software model, overlay model which are delivered with 'as a service'

version of deployed applications. Cloud helps to pool out the ICT resources for all Egov services for efficient utilization. It prohibits manual maintenance costs incorporated in traditional model of deployment. It requires to adopt matching model of cloud version for a particular use case, in-order to establish efficient Egov arrangement within the governance.

The selection a particular cloud model in Egov depends upon the following factors as location, automation, category and authority. As Government in India is spread across diversified groups, viz. central, states, districts, blocks and villages, the applications designed for a particular group need to implement matching cloud model. Another factor includes customization of one application for different groups dynamically and deploy it as a one instance. The Egov applications developed by multiple parties at different levels at center and states need to be consolidated into single multi-tenancy model so duplication of efforts can be minimized.

By means of all these factors, it has been noticed that services generated at different levels need to be consumed at diversely placed resources. All these virtual Egov communities need to interact for a collaborative model of computation for constructing and consuming different data generated at different levels using custom routines of cloud.

The discourse of all these establishments will be managed to unbind the payloads and distribute free resources across all levels via set of processes and procedures. The methodology starts to act by identifying the nodes which taken part in this system and assigning the roles to contribute. The detailed are given below.

“Mi” Represents the number of the Main node i. “Ri” Represents the number of Rear node.

“N1” Represents the number of user requests. “N2” Represents the number of resources available.

“Lij” Represents the number of Main nodes for all Rear node ij.

“ij” lists the relation of node j in job i. “Pij” Lists the parents of node j in job i.

“Rf” Multitenancy factor.

---

for each job request i do

Select Mi tree nodes as Mains;

Select Ri nodes as Rears;

for each assigned Mains i do

Select the parents of node j according to locality DC of node;

Assign the multiple Parents for each node i as Pij and Lij at multiple levels of the rears;

end for

end for

Configure node hierarchies by calling Rears() and Mains() routines;

The processing for given service runs on Mi + Ri nodes; After Processing completes at each node results are sent

Configure node hierarchies by calling Rears() and Mains() routines;

The processing for given service runs on Mi + Ri nodes; After Processing completes at each node results are sent back to current rear;

Collection of the results from super rear node.

for each node j in Mi + Ri do

identification of current rear Pij

if j == Rear then

Pij current parent in Pij 1 to Lij or super rear having the result

else

Pij current rear in Pij 1 to Lij having the result

End if

end for

De-allocation of nodes/Termination of service.

for each node j in Mi + Ri do do

De-allocate the node j from request i, after getting the results from all the rears and mains of j and its results send back to its rear j; end for

After getting the results from all rear nodes, processing terminates at super rear;

This algorithm[8] works to wrap out the distribution and collection of workloads assigned to the cloud[5]. It works by identifying the units of computation at different locations and try to organize the overlay upon it. It does not depend upon the intermittent failures between different data centers by maintaining the nominal replication or tenancy factor.

1. Service Security: Egov targets the creation of an ecosystem which enables advancement to the existing digital infrastructure and facilitates prompt digital services. This requires the huge analysis of IT methods, in order to address the gaps created with respect to Cyber risk and security. They are many levels to address these spaces as preparation, identification, approach, preservation, examination, analysis, and reporting. Here follows detail of all operational factors of network, infrastructure and software components of typical pan dominion Egov setup.
    - Risk Management Establishment, roll-out of a risk management framework, procurement and implementation of an automated Governance, with compliance enables the system to have a clear visibility on the risk profile of the entire IT infrastructure. It manages key risks with optimized processes and controls also conduct of periodic and automated risk assessment. Implementation of appropriate policies, procedure for the treatment of various identified risks will be implemented through central and distributed measures as the framework would be created centrally and would need to be implemented across all locations.
    - Business Continuity and implementation of automated Governance on ISO 22301:2012.
    - Capacity Management Learning Management System (LMS) Integration, sourcing and delivery of technical content, Assessment, training and up-skilling are necessary to counter emerging challenges and cybersecurity concerns with changes in technology. Skilled manpower is better equipped at managing life cycle of any incident, knowledge about system Access, terminated users retaining access, accidental provisioning of privileged access, circumvention of business rules using excessive access, knowledge

about system vulnerability, identification of insecurely developed applications and unpatched systems, configuration of detection systems and network architecture to disallow the propagation of malware, unauthorized access mitigation, third party misuse and error, people behavior patterns, compromising through social engineering, unknown roles and responsibilities.

- Vulnerability management vulnerability scanning, application security, database security malware analysis are key components here. It will uncover the actual risk posture of IT infrastructure (servers, devices, applications) and timely closure of the discovered vulnerabilities. It oversees overall security posture of system with centralized management.
- Resolution Management Incident and problem management, incident ticketing. SIEM eases the work of classifying and prioritizing the incidents. It uncovers the actual risk posture of IT infrastructure deployed for the service with central capability.
- Asset Management Works as asset inventories supported with manual procedures and in the isolated databases of multiple tools with central management by enabling visibility across different modules. It creates the stack of identifiers with naming criteria of individual category and placement. A quick identification of security admin of a resource is guaranteed by this.
- Identity Management ensure mapping of administrative nodes with their digital identity, allows right people have the right access at the right time for the right reasons and makes segregation of duties.
- Cloud Security formalize guidelines for implementing and enforcing security within a cloud operating environment. Development of secure deployment program based on the leading standards to support multi-tenant security practices.

B. Augmented Delivery

Mobile first approach is required for all new generation Egov applications as the mobile connectivity is penetrated to most of the rural areas than regular data connectivity. Services [2] from Egov are required to reach every citizen in rural areas as well. A framework for addressing the needs of mobile governance, with subtle approach on existing infrastructure enables the users to access these services. It is also essential to provide reliable and secure connectivity for these cloud based appliances and data to these mobile rural users. The intermittent nature of present networks makes harder to provide reliable and unified solution.

The proposed approach makes the optimal integration of existing services to provide seamless connectivity to rural areas. The intent here is to create the alternative system of methods with alternative possibilities like SMS mediums which have wider presence in rural areas. This system provides efficacy with improved connectivity with secure communication and easier integration.

Fetch data to send from form or webservice

Compress the data

Determine the SMS Sender & Recipient

if Send to == Logger Server then

Encrypt the compressed data using Selective Hybrid

Cryptosystem

Calculate 'X'='D'='Y' 'X'+'Y'=160 'NS'='D'='X' to distribute the data among 'NS' SMS's

Construct the MetafirstSMS from X & Y and NS

Send the MetfirstSMS

Send the 0NS0 SMS to the Logger Server as SecureSMS

else

Call the JS code to direct the AJAX request.

end if

if Receiver via == Logger Server then

Decrypt and decompress data using Selective Hybrid

Cryptosystem

Collect the MetafirstSMS and retrieve X, Y & NS.

Combine the big text from collected parts.

else

Call the JS code to callback the AJAX response.

end if

This algorithm[6] as depicted in Figure 2 works by defined encryption, compression and negotiating methods at both server and client places. A generic client runs at user mobile, interprets the request and responses and processes the required methods to form the alternative channel for regular web requests to cloud. The intermediary server (Logger) will do the due process at server side.

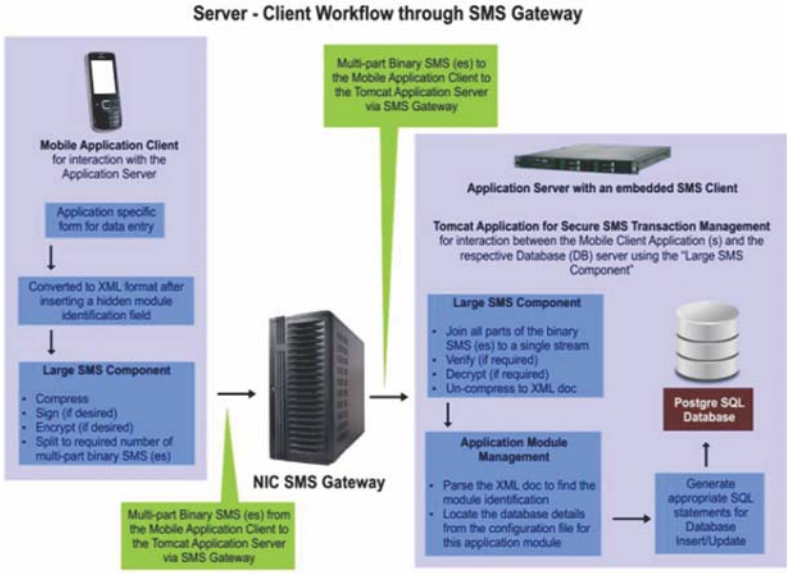


Figure *2: Service Delivery via Alt channels* [Own creation]

C. Augmented Societies

Massive Open Online Courses, National Digital abhiyan mission like initiatives enable masses to empower themselves with use of ICTs. Trend toward ICT applications is towards open source and interoperability. This allows for improved reach in digitally divided societies. By reducing learning curves and shortening of the time of technology generation, ICT based solutions are progressively simplifying the applied contents of education, health-care, agriculture, and environmental governance services. Scale up education and incubation of ICT solutions, including through partnerships with the business sector Public-Private Partnerships (PPPs) for ICT-enabled systems enables digital dividends [9] to these societies. The fragmentation of many small demonstration projects need to be transformed into pan India national level programs. Infrastructure need to be expanded and upgraded for public reach.

D. State Role

The role of state needs to be tuned in line with data and services of e-Governance pattern and it's potential to increase efficiency and enhance citizens' relationship with their governments. Governance effort is directly proportional to the number of objects (Billions of People, Trillions of things like land, building, etc. they use) to be governed. The Center acts as non-partisan group that examines the convergence of data, technology and public policy, publishing legislative data, developing a statewide e-government strategy, and developing an open data system/ policy enabling development of human and business capital. Technology overlaps with states role and acts as a public service mediator like such as distributed ledger technology.

In fact, computational complexity of governance is not even linear; it is exponential. If we include government and citizen satisfaction as an outcome also, the problem belongs to the classical mathematical problem called "stable marriage problem" having computational complexity "NP Complete" (That means the problem has no solution mathematically). A possible well tested mathematical model is domain decomposition as we do in distributed computing or discretization of the structure to large number of elements before applying Finite Element Method for analysis of engineering structures. What it means is to partition the object domain to smaller manageable autonomous units and do the governance locally and then apply appropriate ICT enabled controls at the interfaces between partitions.

This implies that for a large Country like India having diverse behavioural and cultural heritage full/ recursive federalism (both spatially and functionally) upto the village/ habitats level (even upto individual level called self governance) is a practical/ manageable solution for doing effective governance. Technology, in specific, works as helper/ enabler to solve the problems that keep so many people out of the formal economy and system.

Conclusions

Combining new institutional set-ups with transformational technical solutions to manage the governmental activities at all levels, it is required to promote a better approach of public service delivery in diversified conditions. By re-engineering with out-of-box IT apparatus in e-Governance practices with flexible methods discussed can lead to achieve sustainable development goals and digital transformation.

Governance (e-governance, m-governance, etc.) is not only mathematical/ computational problem to be computerized to solve quickly for a faster outcome as well a sociological problem and should be handled through a social structure to build self-governing human beings.

The holistic design and state-of-art IT systems helps the processes of effective E-governance mechanism as an object of Digital Governance systems.

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Factors Critical for CRM Success

Saurabh Singh[1] and Kavita Chauhan[2]

Abstract

Continuous shift in consumer behavior due to changing business-technology continuum is increasingly leading to complexity in managing customer relationships. This has required organizations to look for factors that promise CRM success to cope with changing attitudes and values in consumers, and at the same time, for marketers to create strong differentiators for value creation. Is there a way to find out what will eventually make an effective CRM since one size doesn't fit all? Mostly studies in this direction pointed out 'similar-looking' factors however the range of their contribution and their order varies depending upon the business requirements, and resources available. Our study is a milestone in direction that critically reviews these factors and prescribes why some of these are more critical to organizational CRM success than others. We find that CRM is more of human function than perceived as a technological factor. Some factors that are found critical in its evaluation are training for its rightful adoption, the role of culture and leadership support and its integration with other business processes and applications.

Keywords: Critical Factors, CRM, Culture, Integrations, Leadership, Technology

Introduction

"Science and technology innovations are giving people the power to make over their identities, and they are using them. To what extent people can figuratively and literally reinvent themselves through a combination of computer simulations, computer-human mergers, biomechanics, bioelectronics and genetic engineering is more a matter of speculation that reasoned debate"

- G. PASCAL ZACHARY (http://www.nytimes.com/books/first/z/zachary-global.html)

Business these days is no longer seen in isolation of the technology. Be it any stream or any kind, technology has become the integral part of the business world. Rather it would not be wrong to state that technology has become so critical these days that is has been seen as critical factor regarding the long -lasting relationship between the customer and business.In order tocustomize the services so offered, to recover from service failure if any and to delight customer instantly technology is a facilitator and critical aspect(Bitner, Brown, & Meuter, 2000).

The traditional view regarding the technology was limited to inward optimization of various business processes such as fulfillment of customer order, customer services, management of customer, and other. But with the expansion of technology such as internet the above horizon expanded the wings and brought customer under direct touch.The major challenge that technology oriented businesses face is to provide a clear cut proposition of value to the customers. Value proposition though shall be an outcome of customer centric approach. Customer -centric approach primarily deals with the organizational attitude and resource (DiVanna, 2003).

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(Xu & Walton, 2005) stated that CRM systems that are currently available are majorly governed by operation based applications and analytical application of CRM is being overlooked.

Customer Knowledge and CRM

CRM without the relevant knowledge of customer is not effective. Companies have began to realize that - "if we only knew what we know also includes if we only knew what our customer knew" (Gibbert, Leibold, & Probst, 2002).

(Gebert, Geib, Kolbe, & Brenner, 2003) both CRM and knowledge management aims to gain the competitive edge by efficient resource allocation to various business activities. CRM takes care of the relationship of both existing and potential customer base and company whereas knowledge management deals with the management of critical knowledge availability with the company, as both the aspects forms the pre-requisite for success of the company.

(Fidel, Schlesinger, & Cervera, 2015) stated that literature seems to be lacking on the front of understanding the collaborative role of the customers in innovation.

(Rowley, 2002) explain customer knowledge in two aspects:

- Knowledge or know how about customer including potential customer along with the customer segments.
- Knowledge that customers possess regarding the varying ranges of product

CRM systems - an analytical view

The basic concept behind the CRM is to utilize technology along with the human resource in order to have a better understanding about value, behavior and customer attitudes(Eid, 2007). At times companies find it difficult or uphill task to discover the insights which provide them differentiation and making it tough for the competitors to copy. Even though systems pertaining to data mining and exploration are available in the market but still having the customer insights with clarity remains a tedious process. (Sharma & Goyal, 2011) states that analysis of data provides the support or base to CRM and helps to uncover opportunities and also to trace any ill effects of CRM initiatives.

Research Objective and Methodology

The study is conducted to review the various factors critical for the success of CRM and prescribe why some of them are more critical to organizational CRM success than others.

The study is largely based upon the secondary data collected from various studies that are undertaken by different scholars over the period. Continuous shift in consumer behavior due to changing business-technology continuum is increasingly leading to complexity in managing customer relationships. This has required organizations to look for factors that promise CRM success to cope with changing attitudes and values in consumers, and at the same time, for marketers to create strong differentiators for value creation. Is there a way to find out what will eventually make an effective CRM since one size does not fit all? Mostly studies in this direction pointed out 'similar-looking' factors however the range of their contribution and their order varies depending upon the business requirements, and resources available. Our study is a milestone in direction that critically reviews these factors and prescribes why some of these are more critical to organizational CRM success than others.

Critical Success factors

Customer expectations keeps on increasing or changing, this has made the companies to implement various CRM programs. However, companies fails to recognize the internal processes

that are needed in order to assist the learning regarding individual customer based relationship (Campbell, 2003)

CRM technology plays a role in maintaining and sustaining relations but (Richard, Thirkell, & Huff, 2007) states that customer based communications and the aspects of people shall be considered most important.

Over past few years, CRM has no longer been address as ambiguousrather it has been an area of prime importance. Service industries such as banking Industry(Patwardhan, et al., 2009), especially is considered one of prime sector where CRM is among the critical success factor to ensure the effective and efficient service delivery.Several empirical studies have been done regarding the implementation of CRM. Similarly there have been reports regarding the dissatisfaction pertaining to the improvement post CRM implementations(Becker & Goetz Greve, 2009).

The elements forknowledge based customer-centric organizations inclined towards learning are summarized in the below mentioned table:

Table 1: Components for knowledge based customer-centric learning organizations

Elements	Description
Physical	• Workplace is global, virtual, less hierarchical, and ICT-enabled • Control is distributed throughout a networked structure made up of self-control units or teams
Physiological	• Customer-facing Processes are Knowledge-based, Innovative, and Value Driven • Based on Continuous Learning, Processes are reviewed, redesigned and continuously improved • Customer-centric, redesigned processes are value -adding, flexible, objective and timely
Psychological	• Democratic governance based on distributed locus of control • Share a common customer-centric vision, values, culture • Culture fosters communication and collaboration anytime, any place • Culture stimulates creativity, innovation, continuous learning, and sharing of information and knowledge
Informational	• Workers are empowered to act using Computer Supported Collaborative Work (CSCW) • Acquiring, developing, and coordinating customer data, information and knowledge from integrated customer touch - points and databases
Analytical	• ICT networks are used to integrate and manage CK across customer contact and delivery touch points • Learning is continuous, life-long, and integrated into work experiences.
Serial	• Community is created through alliance with customers and suppliers • Customer loyalty is assessed and improved
Managerial	• Managing proactive, customer - based adaption to changing environment • Planning is used to create strategic organizational alignment and cohesion, both mentally and externally • Knowledge sharing and teamwork initiatives are valued and rewarded • Workforce empowerment, satisfaction and retention are emphasized.

Source: Al-Shammari, M. (2009).

An Oracle white paper(Ten Critical Success Factors for CRM: Lessons Learned from Successful Implementations, 2006); highlighted critical factors contributing to CRM success:

- it is very essential to define business goals which are measurable. Organization must be aware of what is expected out of CRM such as

  - increasing the average revenue
  - enhancing customer retention
  - improvising response time in relation to customers and so on
- One must realize the fact that CRM is all about technology rather technology serves as one part of it. Alignment of information technology with the business it a pre-requisite for CRM success.
- Organization must acknowledge the fact the CRM is a strategic initiative. Thereby an active top management support is required for successful CRM.
- Organization must take care that business goal drive the CRM
- Over- customization is among the major issues which leads to budget over shooting and at times delay in response.
- In order to ensure the proper integration and implementation of CRM organization must look for experienced and trained consultants.
- The involvement of end users is another critical factor. Unless end user's are not involved in the solution design it would be very difficult to develop successful CRM
- CRM project requires adequate training of end user.
- Organization shall not rush in CRM implementation. Phased roll out of CRM may be more effective and successful.
- After the CRM has been implemented organization must actively monitor and measure the CRM system with an intention to improvise on continuous basis.

The prominent factors found that forms pre-requisite for the success of CRM among the several factorsidentified in the study and work of (Maleki & Anand, 2008); (Adhikari & Adhikari, 2009); (Arab, Selamat, Ibrahim, & Zamani, 2010)(kavosh, Bakar, Melat, & Zaleha):

- *Organization Culture as a essential parameter critical for CRM success*: (Arab, Selamat, Ibrahim, & Zamani, 2010) CRM success lies in the hand of the employees of the organization to the great extent. Culture needs to develop wherein the employees of the organization are motivated to learn from the information gather through the CRM systems and shall continuously strive for the improvisation. (Al-Duwailah & Ali, 2013) organization culturerefer to basic assumptions and values that runs across the organization. Organizational culture is a relevant factors that leads to adaptive learning and successful implementation of CRM system as it facilitates the employee involvement.
- *Top management involvement and effective leadership*: Without proper leadership no organization can be successful in its venture. Organization must ensure that the top management should be able to lead from the front by ensuring the commitments and support required by the CRM initiatives and implementation. (Arab, Selamat, Ibrahim, & Zamani, 2010) highlighted this parameter and stated that it is the role of the top management to convince and motivate the employees under their supervision and make them believe in the CRM benefits.(Mohd, Rababah, & Ibrahim, 2011) even before adoption of CRM and its implementation top management support is warranted. Commitment of top management entrust the same across the organization and contributes to a large extent in CRM success.

The Organization culture and effective leadership when complemented by the factors namely - technology adoption (Viljoen, Bennett, Berndt, & Zyl, 2005) and its integration (Rahimi & Berman, 2009) across adds strength to the CRM.

Conclusion

CRM has it existence since long time. Even though CRM is not a new concept but still at times it is seen with the skeptical view reason being the mix response regarding its implementation and the results afterwards. Organization today must give relevance to the aspect that CRM is not only about the technological adoption or the installation of the system software rather it the combination of human and technology with the customer centric approach. Also CRM implementation is an integration of the systems across the organization aiming for better understanding of the customers and providing a proper response in apt time. The CRM success not only requires a theoretical base rather it needs a proper understanding, implementation and execution. Thus organization must pay heed to several critical factors such as precise objective of CRM, active participation of top management and adoption of relevant technology for ensuring the success of the CRM. Top Management being the initiative takers for the CRM is among the prime factors and is required to create an adaptive organization culture through effective leadership wherein the employees who are the main users of the CRM systems shall overcome resistance to change willingly and use CRM system to nurture the organizational goals. Thus, factors that are found critical in CRM success evaluation are training for its rightful adoption, the role of culture and leadership support and its integration with other business processes and applications.

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An empirical Study of Occupational Safety and Health with Special Reference to Certification of Employees

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Abstract

Occupational safety and health is an important area of concern for the organizations. This issue needs to be addressed carefully by the organization. The increasing numbers of incidents and accidents related to safety have eventually drawn the attention of various stakeholders towards making Occupational Safety and Health an integral part of the organizations. This research paper attempts to gain an insight into the various factors pertaining to safety which are instrumental to strengthen the safety mechanisms in the organizations. The paper also addresses the issues related to safety practices and tries to gauge importanceof certifications.

A self-developed 29 items scale was used todetermine the safety perception of employees. The research highlights the importance of safety related certifications and points out that how the safety perception of employees with lesser age is different from employees in higher age groups.

Keywords: Occupational Safety and Health, ANOVA.

Introduction

Safety management refers to the systematic and planned activity driven by top management which aims at controlling the health and safety hazards in the organization(Booth and Lee, 1995). The main aim of the process is to intervene in the cause that leads to accidents. Safety management just not only related to the above but also entails planning and implementation of all activities related to safety. Typically, it includes hazard identification, risk analysis, making proper arrangement for safety management, promotion of safety in the organizations and assessing human reliability. In an effective safety management system, these activities are assigned to all the different hierarchical levels of the organization (Booth and Lee, 1995; Grimaldi and Simmonds, 1997)

Safety management gained prominence and due attention in India only after the Bhopal gas tragedy in 1984. Gupta (2002) researched that the major causes of accident are Indifferent attitude of management towards safety, and lack of implementation of the already existing rules and regulations by the regulatory bodies.After the tragedy, a separate chapter on Occupational Safety and Health has been included in the Factories Act and the outlook of the organizations towards safety also changed dramatically

Literature Review

The economic integration of globe is changing the competitive spirit in which the businesses operate, requiring an expansion strategy to impact long term growth and survival in a positive manner (Karagozoglou and Lindell, 1998).

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According to Sridhar (2006), the small sector is emerging as one of the most important sector for positively impacting the growth of national economies. Inherently, there are many disadvantages being faced by Small and Medium Enterprises as they are transiting into the international environment. (Chen and Huang, 2004).

In the manufacturing organisation, employees are often faced with a lot of risk related to safety and health. These risks directly and indirectly affect business operations. Consequently, for a company to grow and prosper, it is pertinent that risks are effectively managed, because the organisational health, assets and opportunities can be better taken advantage of, if they are taken care of(Fuller, 1997).According to Husain(2010), Occupational Safety is an important elementof social responsibility. He defines Safety as freedom from danger and injury, insuring against hurt and other dangers of risk.

According to Terry E. Sween (2003) unsafe work behaviour takes place as a result of the physical factors which have a bearing in pursuit of existing business.

It has been reported that in 2011-12, the number of fatal accident reported per lakh man days workedin India were 1083. (Report of Labour bureau, 2012).This rate is alarming and calls for existence of safety culture in the organisation.

Safety culture can be defined as "Assembly of characteristics and attitudes in an organization and individuals, which establishes that, as an overriding plant safety issues receive attention warranted by their significance (International Atomic Energy Authority (IAEA, 1986).

Safety culture is an enduring feature of the organization and forms an integral part of organization culture. (Kennedy and Kirwan, 1998)

Zohar emphasized the importance of safety culture by stating that it encourages employees to follow safety behaviour and it leads to the development of safety attitude.

To understand the state of organization with respect to safety, often safety surveys are employed as they can be best viewed as ideally predicting the state of safety performance of an organization It has been suggested that safety climate surveys are good predictors of state of organizational safety performance as it doesn't suffer from traditional biases of reporting and post hoc analysis. Safety culture in particular is a relatively enduring characteristic of organization.

Ojanen et al. (1988) recommended that safety attitude determination should form an important aspect to understand the real safety level of the organization clubbed with other safety surveys. They claimed that changes in the safety behaviour of the employees in the organization can be indicated well through measuring safety climate, which can further be useful in evaluating the programs and drive related to safety in the organization.Davies et al(2001) described safety climate as current variation or nuances of long term culture as the tangible outputs of an organization's health and safety culture, as perceived by individuals or work groups, at some point in time .

Safety climate in the organization can be evaluated typically using employee questionnaires to assess the attitude. Various researchers have emphasized on different aspect of safety to assess the safety level in the organisations.

According to Prakash(2010), Safety training is a safety measure to enable workers to handle unforeseen hazards.

Richter et al(2004) indicated that employee involvement is also important by defining it as the shared and learned meaning, experiences and interpretation of work and safety, expressed symbolically and which guides people. Husain (2010) reinstated in his study that employee

involvement is a behaviour-oriented technique involved in the employees in the upward communication flow and decision making process of the organization. In a study by Fleming(2001), four factors were found to be having a positive impact on how people perceive safety and they are valuing their subordinates, frequently visiting worksites, safety communication and participation of workers in management

Guest et al (1994)in his study found that communication is an important issue to reinforce safety culture.Mearnset al (1998) pinpointed that likelihood of accident is more in absence of job communication and thus it supported the view that safety communication is important for reducing risk of safety and for ensuring safety culture. Reason (1997)studied the importance of safety reporting in the organization. The study by Guest et al (1994) indicated the existence of "macho" attitude among the workers towards safety and studied the importance of involvement and participation of staff. Thus, for the assessing the safety level of employees in the organization, the various parameters can be used.

Structure of Occupational Safety and Health in India

The Role of Government

Occupational Safety and Health comes under the purview of Ministry of Labour and Employment under Government of India. The Industrial Safety and Health branch of ministry is entrusted with the responsibilities to take up the matters related to policy decision and also formulating and implementation of the guidelines for adoption of the rules and regulations related to safety, health and welfare of the employees.

The ministry also takes up the task of piloting the bills through Parliament after consulting with the other ministries and the state government and also the employees and employers' organizations. Liasoning with International Labor Organization and other countries is carried out by Ministry (Ministry of Labour and employment, 2012)

Factories in India fall within the purview of Directorate General, Factory advices service and Labor institute (DGFASLI), which is the technical organization of the ministry of labor and takes care of Occupational Safety and Health and other issues of Factory workers. It provides training for Factory Inspectors and coordinates. A few medical colleges hold Graduate and Post graduate diplomas and degrees for OCCUPATIONAL Health Training. A statutorily approved certificate course for a period of 3 months. In Industrial Health is offered by Central Labor Institute which is a part of DGFASLI. (DGFASLI, 2010)

There are five Regional Labor Institutes RLIs. They are responsible to carry out responsibility for carrying out research related to industrial safety and health. Till recently only Central Labor Institute was there to provide for certification and statutory training.

National Institute of Occupational Health is one of the prime institutes of the Indian Council of Medical Research [ICMR] and has two Regional Occupational Health Centers (ROHC) at Bangalore (1977) and Calcutta (1980) for catering to regional needs. The major task of this institute is to carry out extensive research in the area of Occupational Safety and Health. The institute also provides short term training modules for industrial medical officers, factory inspectors and trade unions as well. The Institute also puts forth its recommendation to the Ministry of Health, Ministry of Labor, Ministry of Environment and Ministry of Commerce on issues related to occupational health, safety and environment. (Saiyed H.N, Tiwari 2004)

Central Board of Worker's education, National Institute of Occupational Health and National Safety Council are among the few councils of repute. The assistance to Ministry of Labour and employment in operating the various awards as that of National Safety Awards, Vishwakarma

National Awards and Prime Minister's Shram award is also provided by it. These awards are primarily meant for promoting safety culture in the organization(National Policy on Safety, Health and Environment at Workplace)

Legislative Framework for Safety and Health in Manufacturing Sector in India

Legislative framework exists in India for safety, health and welfare of employees for long but its implementation is in slipshod. The formal units falling under it comprise of only 10%of the total units.

Occupational Safety and Health fall under the purview of the following Acts:

1. **Factories Act 1948**: This Act contains 120 sections, and is divided into Chapters concerning inspection staff, health, safety, hazardous processes, welfare, working hours of adults, employment of young persons, annual leave with wage, and penalties and procedures. This act has the provisions for Safety, Health and Welfare and special chapters on Hazardous processes added after the catastrophic Bhopal Gas Tragedy, which took away lot many lives. This Act places talks about formation of safety committees with equal number of representatives from management and workers and consultation with employees for framing Occupational Safety and Health Policy.
2. **Worker's Compensation Act:** It is an act to provide for payment by certain classes of employers to their workmen of compensation for injury**.**It's an Act meant to protect the rights of injured workers. It aims at securing the right of injured workers so that they get appropriate medical care, necessary training and rehabilitation. If the workers die due to injury at work, the family is entitled for compensation.
3. **Employees' State Insurance Act (ESIC Act):** This Act deals with protection of workers in case of sickness, maternity, injuries and loss of wages due to work.

Besides this, keeping in the view the urgent and unavoidable need of Occupational Safety and Health, in February 2009, The Government of India has declared **National Policy on Safety, Health and Environment** at Work place and has set to build and maintain national preventive and safety & health culture, as a goal. In order to achieve the aforesaid goal in the national agenda, government has stressed to promote inclusion of safety, health and environment improvement at the workplace as an important component for quality of working life. (Fuller,1997)

The main focus of National Policy on Safety and Health at workplace is placed on Compliance, awareness, Occupational Safety and Health, skill capacity building and research. The national policy on OSH has the following objectives:

- Continuous reduction in incidence of work related injuries, fatalities, diseases, disasters and loss of national assets.
- Maintain comprehensive database of the above for better performance and monitoring.
- Continuous enhancement of community awareness on Safety, Health and Environment (SHE) issues at work related areas.
- Improving SHE at workplace by creation of green jobs contributing to sustainable development. (Health and Safety Executive 2000)

Some Important Certification and Standards for Safety and Health

There are a number of international certifications and standards framed on Occupational Safety and Health which are gaining prominence in the recent times. Some of them are here below.

1. **OHSAS 18001**: It is a British standard for Occupational Safety and Health Management systems. The main reason why it exists is to help all kinds of organisations to put in place demonstrably sound Occupational Safety and Health performance. It puts special focus on forming OSH objectives to help organisations develop policies and objectives keeping into account legal requirements and information about Occupational Safety and Health risks. It was updated in the year 2007 and new specifications are more closely aligned with structured ISO 9000 and 14000 so that organisations can more easily align with existing management systems.
2. **Integrated Management systems:** These are written generally so that they can be applied to all kinds and all types of organisations. Its major focus is on Environment Health and Safety elements that the organisations can reasonably be expected to control. The basic elements which it includes are environmental aspects, hazard identification, risk assessment, objective formulation, performance measurement and monitoring
3. **IS-18001:** It is standard of Bureau of Indian Standards started with an aim to maintain and continuously improving the Occupational Safety and Health Management Systems. It does not state the criteria for Objective setting as such but its unique feature is the stipulation of initial OSH review, design and engineering, purchasing and critical incident recovery plan which are considered to be critical for the success of OSHMS.

Besides these standards, International Labour Organisation (ILO) and Health Safety Executive (HSE) provide the guidelines on this critical and very important issue. Some notable points are as mentioned below:

1. **HSG65**: It is a popular guide of Health and Safety executive, mainly developed for line managers, leaders and owners who want to oversee their organisations Health and Safety arrangement. It extends guidelines to enable organisations strike a balance between systems and behavioural aspects of OSH.
2. **ILO Guidelines** : These guidelines on Occupational Safety and Health exist to provide a unique international model which is compatible with other management systems, standards and guidelines at national levels and international levels.

Objectives of The Study

1. To determine that whether there is any significant difference in the perception of employees towards the factors of safety management based on age.
2. To determine that whether there is any significant difference in the safety perception level of employees based on the certification status of the organization.
3. To gauge into the underlying reasons and motivations for adopting certification among the employees and organizations.
4. To gain an insight into the safety awareness levels of employees.

Hypotheses of the Study

$H1_o$: There is no significant difference in the perception of employees regarding various factors of Safety between groups based on age.

$H2_o$: There is no significant difference in the perception of employees regarding Safety levels between different groups based on certification status of employees

Research Design

The research was descriptive in nature and the population considered for the purpose of study was employees working in shop floor of select medium scale manufacturing organizations in Sitarganj area of SIDCUL (State Infrastructure Development Corporation of Uttarakhand) in India. The size of sample was 202 such employees. The respondents varied from 25 to 55 years of age. Some of the organizations chosen were certified by some safety standards whereas some were not certified. During the course of the study, several safety managers were interviewed to gain an insight into the safety phenomena into practice.

A self-developed scale comprising of 29 items clubbed into 8 factors was used to determine the safety perception level of employees on 5 point Likert scale. This questionnaire was the result of extensive literature review conducted. In the process of literature review,8 factors were identified for determining the safety perception of employees. In the scale, 1 meant Strongly disagree, 2 meant Disagree, 3 meant Neutral, 4 meant Agree, 5 meant Strongly agree. The process of data collection took a period of over 5 months. Participation of workers in the survey was voluntary. Safety perception of employees was measured using a self-developed 29 item scale with 8 factors of safety ie. Safety Training and Supervision, Involvement of Staff, Work procedures, Safety reporting culture, Management commitment towards safety, Injury Management, Communication and safety leadership. Reliability analysis was performed on the instrument used for the study by using Cronbach alpha test and the score came out to be more than .7which indicated that the statements are internally consistent.Cronbach's alpha is the most common measure of internal consistency ("reliability"). One way ANOVA was used to examine the difference in the mean perception of employees towards different factors of safety based on age of employees and certification status of the organizations. The precondition of applying one way ANOVA is to test the normality of the data and it was done using Shapiro Wilk's test.

Data Analysis

Table 1 shows the mean and standard deviation of responses obtained from the respondents on 29 items scale put into 8 factorsof safety. The self developed scale aimed at finding the level of safety perception of employees with respect to various factors responsible for ensuring safety in the organisation. The factors with their mean scores and standard deviations are as follows.

Table 1: Analysis of Variance

Factor Name	Upto 40 YRS (N=112)		More than 40 YRS (N=90)		OVERALL		F value	P value
	Mean	SD	Mean	SD	Mean	SD		
Safety training and supervision	4.31	.58	3. 29	.57	4.31	.56	.56	.57
Involvement of Straff	4.24	.67	3.15	.83	3.75	.73	.17	.04**
Work Procedures	4.19	.56	2.18	.72	3.18	.61	.25	.007*
Reporting safety	4.20	.68	4.27	.58	4.23	.64	.77	.46
Management Commitment	2.52	.57	2.79	.60	2.60	.58	4.72	.01*
Injury Management	2.70	.88	3.00	.86	2.75	.89	8.32	.00*
Communication	4.24	.70	4.15	.73	4.23	.71	1.07	.34
Safety Leadership	4.35	.63	4.24	.84	4.34	.70	4.48	.01*

*significant at.01 level **significant at .05 level

Every organization is required to follow some practices with respect to Safety of the employees. The various factors related to Safety of employees were identified by carrying out extensive literature review and in order to examine the safety related practices being followed in the organization, employees were asked to rate various statements related to different parameters of safety. The Table 1 shows the result of Analysis of variance of various factors pertaining to safety based on the age of employees. For this purpose, the employees from different organisations were categorized into two age group ie Below 40 years and above 40 years.

It is clear from the Table that at overall level, employees strongly agreed that there is a mechanism of safety training and supervision(mean score= 4.3), involvement of staff (mean score=3.75), safe work procedures(mean score =3.18), reporting unsafe practices culture (mean score = 4.23), Communication (mean score= 4.23), safety leadership(mean score = 4.34) whereas they showed slight disagreement on the practices related to injury management(mean score= 2.75) and management commitment to safety(mean score= 2.6)

Further One-way ANOVA was applied to examine the difference between mean scores of various factors influencing the employees' perception about safety with respect to age. The result of one way ANOVA indicates that difference in mean score is significant at .01 levels for 5 factorsviz. Injury management, safety leadership, work procedure, involvement of employees and management commitment to safety for which the F values are 4.42, 8.32 and 4.48 respectively. However, the F value turns insignificant for remaining factors viz. Safety training and supervision,reporting safety, safety communication. Hence, it can be concluded that with respect to age, there is a significant difference in safety levels of employees when it comes to involvement of the staff, work procedures, management commitment to safety, safety leadership and injury management. Hence it could be inferred that employees below the age of 40 years have a better perception towards safety in the organization.

Table 2: Table showing various factors pertaining to Safety management and difference in perception based on certification status using Analysis of Variance

Factor Name	Certified organization		Non certified organizations		F value	P Value
	Mean	(SD)	Mean	(SD)		
Safety training and supervision	4.17	.49	3.39	.80	3.81	.03
Involvement of staff	4.86	.89	4.38	.88	4.03	.00 *
Work Procedures	4.33	.64	3.21	.76	.612	.03
Reporting safety	3.84	.65	2.10	.80	7.54	.00*
Management Commitment	4.70	.63	2.70	.68	4.096	.001*
Injury Management	3.97	1.08	2.75	.87	2.26	.05**
Communication	4.70	.75	2.10	.97	4.22	.001*
Safety Leadership	4.86	.78	2.29	.78	3.45	.00*

The results showed that there is a significant difference in the perception of employees based on the certification. it is apparent that there is a significant difference in the perception of employees regarding safety training and supervision. The difference in the mean clearly states that in certified organizations, the employees have better perception for safety training and supervision which implies that certified organizations put due emphasis on the training of employees as compared to the non-certified organizations.

Involvement of staff in the safety practices: During the research, it was observed that staff involvement in the safety can really carve the way for ensuring better safety culture. For ensuring such culture organizations have started working on collaborative approaches to foster cohesiveness in the organizations. Many of the organizations have started working towards suggestion of employees in management and their involvement in the accident analysis as well.

Work procedures: There is a significant difference in the perception of employees towards safe work procedures based on certification of employees. The employees working in certified organizations tend to be more safety oriented in their work mechanism. It was also established that due to streamlined and systematic standard operating procedures in the organization, the tracking mechanism for discrepancy also becomes easy.

Reporting safety: The culture of reporting the accidents and anomalies was though seen to be moderate in even certified organizations, yet there was significant difference was found between them based on their certification status.

Management commitment towards safety: During the course of research, it was established (based on interviews)that safety equipments' needs in India is showing an increasing trend as compared to earlier. The relation of the same could be drawn with seriousness of Government towards safety concerns which is compelling organizations to ensure safety. As a result of it, more organizations are going for certifications and definitely safety culture cannot be ensured without the commitment of top management.

Communication: Safety communication in the form of safety policy and objection was found to be the prominent feature of the organizations which are certified and the employees' perception towards the same was also seen to be very high. The employees were randomly asked about safety mechanism and route for cordoning off and they were found to be highly aware of various safety mechanism.

Safety leadership: It was established that perception of employees towards safety leadership was much higher in safety certified companies as compared to non-certifiedorganizations.

Some EXCERPTS from the interview of safety managers and professionals.

On discussion with managers in the organization, it was established that a lot of conscious efforts are being put by the organizations to promote safety culture in the organization and they place emphasis on health of the workers and welfare of the workers as well. The following points were found to be important from the discussion.

A. On interviewing safety and health managers, it was established that "Though Employees had a very casual attitude towards safety at the workplace, yet management was successful to constantly reinforce the safety practices by the management for safety of employees and to make them lend ears to the safety awareness Health and safety training is imparted to the employees at frequent intervals i.e. Twice a year or quarterly "andevaluation of training effectiveness is done on continuous basis

B. Nearly half of the small and medium enterprises reported that they are certified by some safety quality certifications like OHSAS 18001, ISO45001 and comply with the standards of safety and health. On being questioned that why do they go for certification, they answered that it is not only the requirement of the management but also the requirement of the client organization. They say that it's the pre-requisite of client organizations for signing the contract because they don't want to compromise with the quality.

C. The safety managers firmly believed that it's the culture which needs to be made an integral part of the organization and top to bottom approach needs to be followed in this regard.Assuming safety and health as the prime responsibility by each and every employee can only create difference. For cultivating this practice, safety champions can be identified who may be assigned the task of proactively working for promoting safety culture and nurturing he culture of safety.

D. Safety certified organizations were found to be proactively involved in spreading awareness through posters, leaflets, video conferences, safety and health camps

E. The employees are not only incentivized for the same but effort is made to make them set safety and health as a priority to other aspects.

F. Risk assessment was found to be an important issue during the discussion and most of the organizations claimed that they are following it as a regular practice.

G. One of the managers interviewed who belonged to safety equipment manufacturing concerns pointed out that there is increasing demand of safety equipment these days due to growing awareness and more strictness towards safety.

H. There are regular third party safety inspections especially by different certified organizations.

Recommendations

1. Organizations need to pay special emphasis on raising the motivation level of employees with higher age group to improve the safety mechanisms in the organizations.
2. It was inferred from the research that certifications improve the safety culture of the organization. Therefore, safety related certifications should be obtained by the organizations as they streamline the safety process implementation
3. Safety champions can be identified and may be assigned the task of proactively working for promoting safety culture and nurturing he culture of safety.
4. Accident analysis and integrating the safety mechanism with Information technology can act as a catalyst in improving the injury rates and preventing the loss
5. Safety policies should be formulated and communicated to the employees by displaying it prominently on the notice boards.

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