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VISION

The vision of the journals is to provide an academic platform to scholars all over the world to publish their novel, original, empirical and high quality research work. It propose to encourage research relating to latest trends and practices in international business, finance, banking, service marketing, human resource management, corporate governance, social responsibility and emerging paradigms in allied areas of management. It intends to reach the researcher's with plethora of knowledge to generate a pool of research content and propose problem solving models to address the current and emerging issues at the national and international level. Further, it aims to share and disseminate the empirical research findings with academia, industry, policy makers, and consultants with an approach to incorporate the research recommendations for the benefit of one and all.

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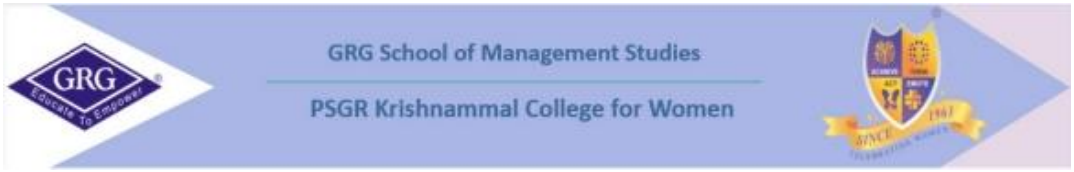

INTERNATIONAL CONFERENCE
INDUSTRY4.0: DEVELOPING SUSTAINABLE COMPETITIVE STRATEGIES
08TH-09TH MARCH 2019

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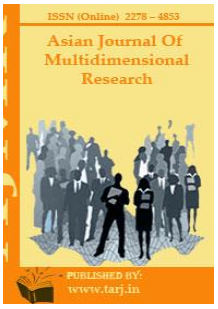
Director's Message

Industry 4.0 involves the seamless convergence of the physical and the virtual world through the integration of technologies including the Internet of Things, Big Data Analytics, Business Intelligence, Mobile Technologies, Cloud Computing, Artificial Intelligence, Augmented Reality, Robotics and Automation. It is creating sweeping changes across industries, offering opportunities and challenges to all the members in the ecosystem including organizations, investors, employees, suppliers, consumers, government and policy formulating bodies and the society. Since organizations are the forerunners of Industry 4.0, their preparedness and adoption will have a huge impact on their sustainability. Industry 4.0 solutions will change the way companies operate and therefore, organizations need to evolve appropriate strategies to gain sustainable competitive advantage.

GRG School of Management Studies organized the International Conference on "Industry 4.0: Developing Sustainable Competitive Strategies" on 08-09 March, 2019 to provide a platform for the discussion, collaboration and intellectual stimulation of the preparedness, embryonic approaches, innovative practices and strategies to be adopted by organizations and its stakeholders in adapting themselves to this global trend. I appreciate and thank the invited speakers and paper presenters from the industry and academia for contributing their perspectives on the theme.

This special volume of the Asian Journal of Multidimensional Research brings out 14 selected papers presented during the conference. I congratulate the conference coordinators: Dr. B. Sripirabaa, Associate Professor and Dr. Savitha Nair, Associate Professor and specially thank the Journal's Editorial Board for their contributions in bringing out this special edition successfully.

Dr. P. Sadhasivam



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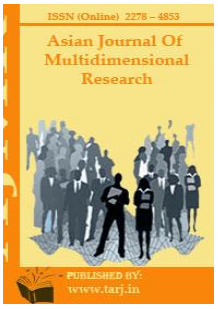

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EMOTIONAL INTELLIGENCE AND RESILIENCE FOR EMBRACING CHANGE DURING INDUSTRY4.0

Ms. M. Reshma*; Dr. B. Sripirabaa**

*Research Scholar,
Department of Management,
PSGR Krishnammal College for Women,
Coimbatore, Tamil Nadu, INDIA

**Associate Professor,
Department of Management,
PSGR Krishnammal College for Women,
Coimbatore, Tamil Nadu, INDIA

ABSTRACT

Industry 4.0 or the fourth industrial revolution as it is commonly called is an era of automation and digitization but most importantly an age of turbulence, volatility and uncertainty. Every time industry embraces new technology or automation, there is always reluctance and resistance from people for fear of change. While change is inevitable, our preparedness for it is what matters. Only organizations that are able to predict future changes and prepare well in advance grow with time and survive. Though the impact of industry 4.0 will be felt in every department of an organization, its effect on the human resources will be the strongest. So, what will be required of the employees in an organization in the age of machines? What are the competencies that employees will be required to possess in order to adapt to changing times? Up skilling and continuous search for knowledge will be the norm if one has to sustain among the hyper intelligent machines, but what competencies in a person will facilitate such adaptive behavior? This paper tries to conceptualize a model that proposes that emotional intelligence and resilience of an individual can facilitate himto effectively adapt and manage changes like the fourth industrial revolution.

KEYWORDS: *Emotional Intelligence, resilience*

INTRODUCTION

Industrial revolutions generally are marked with innovative technologies employed in the field of manufacturing that have an impact on the economy of a country and its citizens. Till now the world has experienced three industrial revolutions and is in the midst of the fourth one. The first industrial

revolution (1760-1840) which originated in Britain commenced with use of technology in manufacturing and slowly spread to the other continents as well. The transition from hand production methods to machine production processes was truly revolutionary and its impact was huge and pervasive. While the first industrial revolution was marked with the mechanization of manufacturing processes through water and steam power, the second industrial revolution happened with the advent of electrical power in manufacturing processes. The fourth industrial revolution is the continuation of the third where computers entered the world of manufacturing. Though some industrialists do not believe in naming this as a separate phase of development and consider it as a natural progression of the third industrial revolution, the invasive effects of this phase has compelled the usage of a separate term for this as industry4.0. Though the computers were introduced in the third industrial revolution, in industry 4.0 they will connect and communicate with each other to make decisions without human interference (Ślusarczyk, 2018), thus making the so called 'smart factories' a reality.

Every industrial revolution has successfully created notable economic upheaval and changes in the organization structure. Along with sustained and unprecedented growth an industrial revolution brings about irreversible changes that have the ability to affect the human resources of a firm, both in a positive and negative way. With the advent of machinery and automations, manufacturing processes have become simpler thus eliminating much of the physical labor which was previously carried about by the employee. While this can be attributed as one of the positive aspects of these industrial revolutions, enhanced complexity of jobs, increasing demands from the human resources for productivity, continuous innovations and creativity have doubled the emotional labor of an employee. Moreover the introduction of artificial intelligence requires the employees to engage in continuous up skilling and increase their technical competence. This may be simpler when considering the young working force in developed countries, but when it comes to the underdeveloped and developing countries the employees are slightly older and not familiar with the new technologies (Transtenjak and Cosik, 2017). All these demands are bound to create emotional pressure for the employees and change their way of life in innumerable ways. But like any change, these industrial revolutions will persist and it is only wise to be prepared to embrace them. Since when utilized properly they can lead to exponential growth of an organization. Standing on the verge of the fourth industrial revolution or I4 as it is popularly called,it is high time that we explore on how ready are we to embrace it?

The basic concept was first presented at the Hannover fair in the year 2011. Since its introduction, Industry 4.0 in Germany is a common discussion topic in research, academic and industry communities at many different occasions. The term Industry 4.0 was gifted to the world by Germany. The basic concept was first proposed at the Hannover fair in 2011 and then formally adopted by the German government in its 2020 strategic plans in 2013.It is the contemporary issue that is of major concern to the manufacturing sectors of the world (Sommer, 2015). It marks the beginning of the current trend of automation and data exchange in manufacturing technologies. It comprises of the cyber-physical systems, the Internet of things, cloud computing, cyber security, intelligent robotics, PLM, semantic technologies, industrial big data, computational vision and cognitive computing (Baena at al., 2017; Posada et al., 2015; Dallasega et al., 2018). Basically it is one of those phases where technology will change the way things were manufactured.

Industry 4.0 offers a lot of opportunities to the organizations that are willing to grow and expand. With the aid of smart technologies, manufacturers can optimize their operations efficiently and quickly by knowing what needs attention.Similar to the other industrial revolutions, industry 4.0 also

carries with it certain uncertainties and ambiguities which will be needed to be dealt with by the organizations who wish to survive and sustain.The foremost requirement will be the financial cost for implementing such advanced technologies, which could be difficult for new entrants and SME's. Secondly generation of large amounts of data requires big time data analysis. Though this will be taken care of by the cyber-physical systems (CPS), internet of things (IoT), cloud computing etc, the involvement of human resources cannot be overlooked. To manage this herculean task, the organization's human capital will have to be exemplary and smarter than the machines they monitor.Human professionals will be obligated to adapt and change since the roles that are known to them are highly likely to get a different structure during industry4.0. Workers have to learn to deal with new situation and accept the term of life-learning process (Ansari et al, 2018), constantly improving their performance (Transtenjak and Cosik, 2017). Hence organizations need to focus in future proofing their employees before they adopt technologies and automation, since the competitiveness of an organization is more defined by their competent workforce rather than machines and systems (Bauer et al, 2015).Keeping in line with this view a study by Hecklau et al (2016) has come up with a competency model for the development of human resources of an organization to overcome the challenges of industry 4.0. Hence human resource development will play a more prominent role during industry4.0.

With increase in competitors worldwide and the need for process customization to suit rapidly changing customer requirements, there will a huge demand for innovation, creativity, and enhanced skill level from the human resources of an organization (Hecklau, 2016).The pressure to perform will be more than ever and in such situations an employee will have to be equipped with a certain flexibility and adaptability which can only be facilitated by his/her emotional intelligence.

'RULE YOUR FEELINGS LEST YOUR FEELINGS RULE YOU'- Publilius Syrus

Emotional intelligence refers to a set of skills that contribute to accurate appraisal and expression of emotions in oneself and in others, effective regulation of those emotions and the use of feelings to motivate, plan, and succeed in one's life. (Meyer and Solovey, 1990). These are the four basic skills that an emotionally intelligent person is known to possess. Though the concept of emotional intelligence first appeared in a paper published by Michael Beldoch in 1964, Meyer and Solovey were the first to develop a model for emotional intelligence in 1990. However the term gained popularity after the Goleman's book of 1995, titled,' Emotional Intelligence – Why it can matter more than IQ'. The reason why the term was acknowledged could be because Goleman had invariably shown the much larger scope of emotional intelligence and how it is related to an individual's achievement in both work and life settings. Earlier experiments conducted on patients suffering from brain damage have shown significant overlapping between general intelligence and emotional intelligence in terms of behavior. Like Goleman various scholars, like Bar on (1985) Insead and Huy(1999) Parker(2004),have empirically tested the significance of emotional intelligence and found that sometimes EQ can be more important than IQ especially when the individual is facing difficult and challenging times. Emotional Intelligence of an individual apart from predicting his/her performance (Cote and Miners,2006) and leadership attributes (Downey, Papageorgiou & Stough, 2005), team cohesiveness and learning propensity also gives an individual emotional clarity that helps them to face the obstacles and hurdles better in life. (Berrocal et al, 2006).The emotional intelligence of an individual helps them to engage in adaptive behavior in the face of challenges. This can be well associated to industry 4.0 wherein the work environment will most likely be unpredictable and challenging. Success is as important as survival during industry 4.0 since it is not a temporary, but a continuous and persisting phase. Organizations that fail to revamp

their resources might run the risk of extinction. As industry 4.0 takes shape countries across the world are acknowledging the work complexities their human operators will be facing in no time (Longo et al, 2017).

'TOUGH TIMES DON'T LAST BUT TOUGH PEOPLE DO'- Robert H. Schuller

While the organizations aim to bank on the opportunities of industry 4.0, failures and setbacks will be common. But it will depend on the mindset of its human resources and their perception of these setbacks that will influence the success and sustainability of these organizations. Resilience is one such factor that can have significant influence on an individual's mindset in the face of adversity.

Resilience is defined as "the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks" (Walker et al. 2004). Resilient individuals recover from adverse situations more quickly than individuals who are not resilient enough (Bonanno, 2004).Thus the resilience of an organization's human resource will help it tospring back to normalcy when confronted by challenges and gain the lost momentum. Study by Andrew et al,(2011) have also shown that emotional intelligence is an antecedent to resilience.Thus the proposed theoretical model envisions that when employees are emotionally intelligent and resilient, they will be better able to embrace changes and this in turn will ensure an organization's success during industry4.0.

METHODOLOGY

The study is descriptive in nature and has utilized data collected from journals indexed in EBSCO, EMERALD, and Research Gate to propose the research hypothesis.

THEORETICAL FRAMEWORK

Industry 4.0 or the age of digitization is based on the four principles of interconnected network of machines, information transparency, enhanced technical assistance and decentralized decision-making. These advanced technologies are aimed at helping organizations to face challenges like heterogeneous markets, global competition, constantly changing consumer demands and shorter production to market time cycles. While simple monotonous processes will become automated, the other procedures will become more complicated (Becker and Stern, 2016) and changing of job profiles will become inevitable (Hecklau 2016). The Inclusive Growth and Development Report 2017 on future jobs in the context of industry 4.0 asserts that disruptive changes in the employment landscape are likely to occur during this phase. It foresees significant job creation, job displacements, and widened skill gaps among the other changes. It quotes the findings of a popular study by McLeod, Scott and Karl Fisch (2009), which states that 65% of children entering primary school today will mostly end up working in completely new job types that don't yet exist.

While many research scholars are contemplating the readiness of organizations to implement industry4.0, a survey conducted by the software giant Infosys in collaboration with the Institute for industrial management at the University of Aachen, Germany (2015) reveals that only 15% companies worldwide have dedicated strategies in place to implement industry4.0. The survey was conducted among 400 companies in five highly developed countries like China, France, Germany, UK and the US. The survey results also show that 85% of companies are aware of the concept and China has the largest number of early adopters. Another study conducted by Basl (2017) has identified that insufficient skills and training as one of the causes for not implementing Industry4.0 in companies of Czech Republic. Thus confirming that successful implementation of industry4.0 demands skills and sufficient training for the organization's human capital. The study also concludes

that creating awareness about industry 4.0 is essential to motivate employees to embrace industry4.0 and accept it as the norm. The other track of research about industry4.0 deals with scholars trying to propose models enumerating the competencies and skills that will be required from the employees. A study by Benesova and Tupa (2017) has proposed a set of skills and qualifications that will be demanded by the various professionals during implementation of industry 4.0 in manufacturing companies. Skills like flexibility, problem solving capacity and also willingness to learn are mentioned as requirements for almost all jobs. The duo believes that the existing employees will have to be retrained if the organizations are willing to implement industry4.0. Hecklau et al (2016) in their study about a holistic HRM approach for industry4.0 have enumerated on the challenges the organizations will most likely face during industry4.0 and the various competencies that the employees will need in order to combat these challenges. They have categorized the various competencies as Technical, Methodological, Social and Personal competencies. While the technical competency is about constantly updating of one's knowledge related to their respective field of expertise, the social and personal competencies of an individual constitute his/her emotional intelligence. The required traits like flexibility, ambiguity tolerance, motivation to learn, ability to work under pressure, sustainable mindset, compliance, ability to cooperate, networking and communication skills as identified by the authors are determined mostly by the emotional intelligence of the employees. According to the study these core competencies decide the readiness of the employees for industry4.0 and are crucial to its successful implementation. According to Bradberry and Greaves (2009), the four skills of emotional intelligence i.e.self awareness, self management, social awareness and relationship management pair up under the two competencies namely personal and social competencies. They believe that emotional intelligence is the foundation for a host of skills like change tolerance, flexibility, stress tolerance, time management, social skills and decision making. Irrespective of the job type Emotional intelligence is known to account for 58% of performance. Scott and Chan (2004) have synthesized a theoretical model that shows how when properly harnessed, emotional intelligence can improve the organization's ability to manage change and improve performance outcomes. Winkler and Flaum (2015) highlight the study by Meyer and Solovey to confirm how emotional intelligence of a person increases his learning agility and change accepting propensity. To keep in pace with changing times an employee should be willing to learn and stretch from his/her comfort zones while demonstrating more adaptability than resistance. Huy and Insead (1999) also believe that emotional intelligence facilitates individual adaptation and change which in turn increases the likelihood for organizations to realize radical change. Revolutionary changes like industry4.0 are likely to trigger mixed emotions among the human resources of an organization. During the implementation process small setbacks will be inevitable, and only emotionally intelligent employees with a stronger sense of self worth will be able to balance the emotions and progress. Emotional intelligence also helps them to draw on their inner strength to face adversities and bounce back to normalcy by building on their resilience.Armstrong et al (2011) studied the impact of emotional intelligence on the resilience of 414 individuals who have faced adversities in life. The study confirms that emotional intelligence appeared central to psychological resilience of the individuals. Keeping in line with this finding, is a study conducted by Edward and Warlow (2005) which infers that to cope with adversities emotional intelligence and resilience are required and that they can be developed through support and training programmes. Similarly a study by Bahram (2007) with 557 participants has revealed that emotional intelligence was a stronger predictor of resilience than cognitive intelligence thus proving that emotional intelligence has a significant impact on the resilience of an individual. Hence employees with high emotional intelligence tend to become more resilient in due course of time. Resilient

individuals expend less effort in assimilating organizational change and therefore have greater potential to improve productivity and quality. Mallak (2016) has expressed his view that resilient individuals tend to participate in positive coping behavior when confronted with adversities and have greater tolerance for ambiguities. He also stresses on the fact that resilient organizations seek better processes for dealing with uncertainties and turbulent business situations. Thusa considerable level of emotional intelligence and resilience helps employees to better cope up with challenges and setbacks induced by Industry4.0 within organizations.

Based on the arguments stated above the study proposes the following hypothesis

H_1: Emotional intelligence is significantly related to resilience of employees.

H_2: Emotional intelligence and resilience of employeesis significantly related to organization's capability to embrace industry4.0

RESEARCH IMPLICATIONS

The above stated hypothesis needs to be tested with data collected from employees to ascertain the impact of emotional intelligence and resilience of employees on an organization's capability to embrace change imposed during industry4.0.The study tries to understand and establish the relationship between emotional intelligence and resilience of employees and their impact on an organization's ability to embrace change in the face of industry4.0. In a work environment full of ambiguity and uncertainty, it is essential to conduct studies of this nature in order to explore and identify factors that can enhance an organization's ability to embrace change. Studies in this context support the study hypothesis that emotional intelligence enhances an individual's resilience and this in turn accentuates an organization's capability to embrace change effectively. Emotionally intelligent people have considerable control over their emotions and possess social skills that help them to navigate through tough times. When people are well aware of their emotions, they are able to steer them in a positive way even during challenging times. Such people are able to recover from setbacks and are resilient enough to handle pressure. When such employees are there in an organization, the atmosphere within the system is conducive to change. The studies regarding industry4.0 predict the ambiguous and uncertain nature of the work environment that will prevail during its implementation. Since we are already in the midst of industry4.0, it is only advisable that organizations resort to strategies and training modules that will enhance the emotional intelligence of the employees and prepare them for the future. Only a workforce with greater flexibility and a mindset to embrace change will be able to determine the success and sustainability of an organization during times like industry4.0. This study finds conformity with Charles Darwin's ideology about change that, "It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change."

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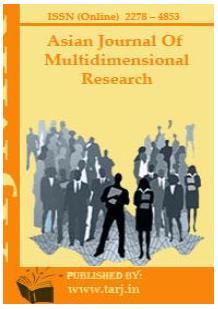

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THE IMPACT OF ENTERPRISE RESOURCE PLANNING IMPLEMENTATION IN TEXTILE INDUSTRIES

Ms. A. S. Lakshmi A. S*; Dr. S. Kavitha**

*Ph D Scholar,
Department of Management,
PSGR Krishnammal College for Women,
Coimbatore, Tamil Nadu, INDIA

**Associate Professor,
Department of Management,
PSGR Krishnammal College for Women,
Coimbatore, Tamil Nadu, INDIA

ABSTRACT

The Indian textile industry is one of the largest sectors in the world. The trend in clothing changes day by day. Textile industries always have to run along with the needs of the customers. Textile industry generally involved not only the procurement, manufacturing and distribution of the product but also channel management and sales generation. Quality control is also a very important part of the industry where, like any manufacturing company, the quality of the raw material to the finished good is important. Good quality leads to a better extended life which is an important criterion for the consumers to buy the product. A textile solution makes it easier for the vendors to manage all the processes from one place while keeping their control in check. To satisfy the needs of their customers, the industries adopt many technologies. One such technology they use is Enterprise Resource Planning. They adopt this to integrate their various departments like R&D, sales and marketing, manufacturing, human resources, financial and so on and various processes like spinning, weaving, dyeing, printing, finishing and packing. A good ERP in textile industry helps organization to maintain their inventory, quality control, manufacturing process, distribution and finance. All the major processes of textile industries like production tracking, material requirement planning and production schedule and also in reduction of cost, management of inventories and timely distribution of goods can be solved using enterprise resource planning. Initially, due to its high costs, only multinational companies adopted ERP. But nowadays there are many ERP packages available in different cost. Hence many small and medium companies have started using ERP. Tirupur is a major textile and knit wear manufacturers and exporters in India. Many of the textile industries here are using enterprise resource planning to eliminate the wastages in the form of

material, energy and inventory. The purpose of this article is to identify the usage of ERP in textile sector quoting some success stories.

KEYWORDS: *Enterprise Resource Planning, ERP implementation*

INTRODUCTION TO ENTERPRISE RESOURCE PLANNING

Enterprise Resource Planning is defined as the capacity to deliver an integrated suite of business applications. ERP tools share a common process and data model covering broad and deep operational end-to-end similar processes, such as those found in finance, HR, distribution, manufacturing, service and the supply chain. ERP applications power and sustain a range of administrative and operational business processes across multiple industries, including line of business, customer-facing, administrative and the asset management aspects of an enterprise. However, Implementing ERP in an Industry comes with a great cost. In Short, ERP is basically a software suit that assimilates the whole enterprise, covering the whole internal supply chain from vendors and suppliers to customers.

ERP MODULES

The ERP systems help the management by making the planning process more productive and efficient. All ERP packages contain many modules. The number and features of the modules differs with the ERP package. Some of the most common modules available in almost all the packages are finance, manufacturing & production planning, sales & distribution, plant maintenance, quality management, materials management etc. Some packages will have a sub-set of this and some will have more modules and features.

ERP IN TEXTILE INDUSTRY

Textile manufacturing rotates around three entities- customers, banks and suppliers. A customer gives a sales order to the company and these forms the basis for the production planning. Raw material is purchased and shipped to the mills. Receipts and payments are made through banks. Before the ERP deployment, almost all the administrative works were done manually and as a result there were lot of inaccuracies, wrong entries that created a multitude of problems. ERP has enabled accountability, accuracy and transparency without infringing the existing workflow.

DEVELOPMENT OF ERP PACKAGE FOR TEXTILES

ERP enables a companywide integrated information system covering all functional areas such as manufacturing, sales and distribution, accounts, payables, receivables inventory, human resources, etc. ERP integrates and automates most business processes and shares information enterprise wide in real time thus improving customer care service and corporate integration. ERP solution consists of manufacturing, marketing and finance sectors. ERP packages include the following modules.

Fibre Module

Fibre Module includes market price of fibres as well as technical specifications like grades, fineness, strength, moisture regain, etc.

Yarn Module

It includes technical parameters like yarn count, strength, weight, CV%, twist, quality ratio, breaking strength and deformity, production details such as lot number, shift production, efficiency and

wastage, process parameters such as carding, drawing, spinning and commercial details such as end use, market price, etc

Fabric Module

It comprises of

- Technical specifications like yarn count for wrap and weft, reed count, ends and picks per inch, process specification at winding
- Process details like weight and fabric width, number of knots, sizing paste, size take up. Ends and picks fabric faults

Production Module

Production Module enhances and maximizes the utilization of manufacturing capacity, parts, components and material sources using historical production and sales forecasting.

Purchasing Module

It designs procurement of required raw materials, as it automates the process of identifying potential suppliers, negotiating prices, placing orders to suppliers and related billing processes.

Inventory Control Module

The process of maintaining appropriate level of stock in warehouse through identifying inventory requirements, setting targets, providing replenishment techniques and options, monitoring item usage, reconciling inventory balances and reporting inventory status is being facilitated and streamlined by the Inventory Control Module.

Sales Module

The key functions of this module are order placement, order scheduling, shipping and invoicing.

Marketing Module

This includes lead generation, direct mailing campaign and trends in customer tastes.

Finance Module

The core module of ERP is the Finance Module, as it gathers financial data from various departments and generates reports such as balance sheet, general ledger, trial balance as well as quarterly financial statements.

Human Resource Module

It regularly sustains a complete employee data base to include contact information, salary details, attendance, performance evaluation and promotion of all employees. It is crucial in optimizing the utilization of the expertise of all employees.

FUNCTIONS OF ERP SOFTWARE

Sales order entry considers color size combinations, creation of invoice, shipping document, sales invoice, picking of finished goods, packing list generation and handling letter of credit facilities.

- Inventory
- Procurement
- Production

- Costing
- Managing dye house

DIFFERENT PHASES OF ERP IMPLEMENTATION

The different phases of ERP implementation are depicted in Fig 1.

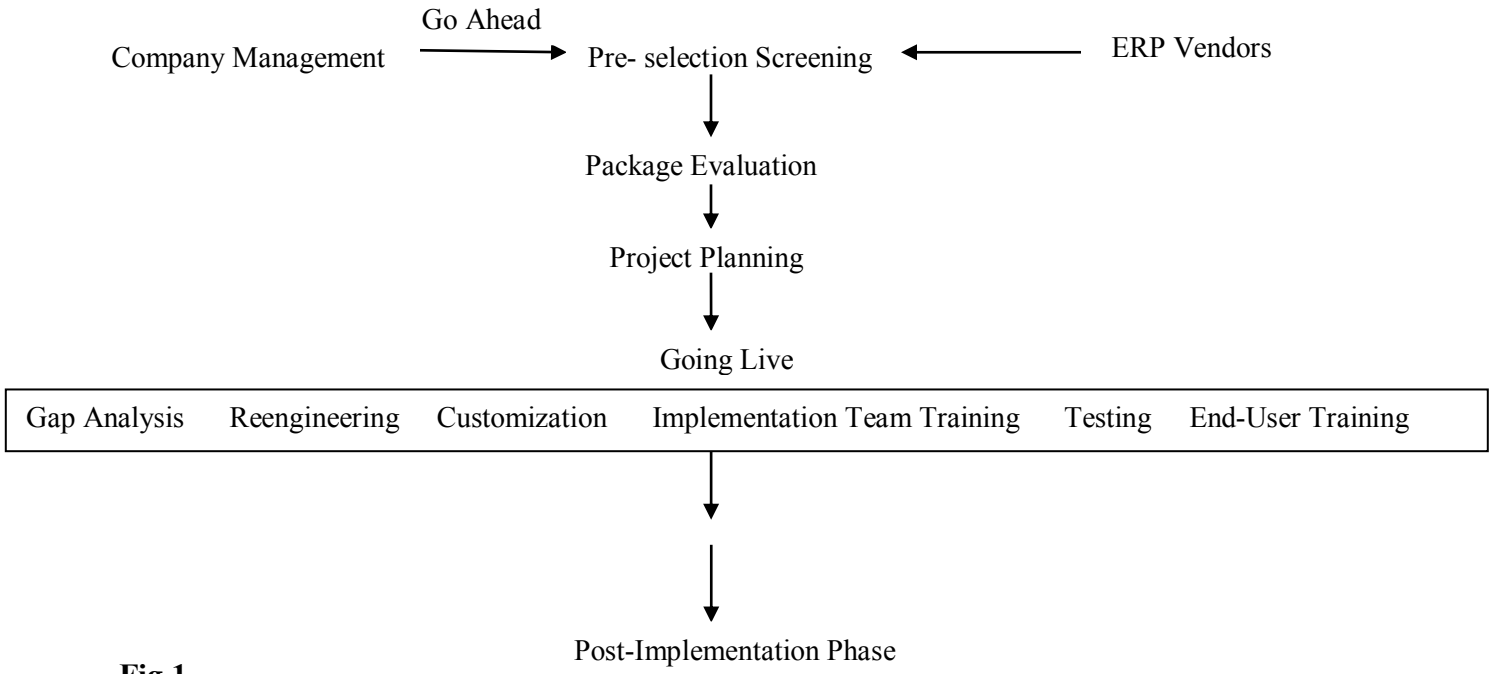

Fig 1

Source: Alexis Leon, "*Enterprise Resource Planning*"

Pre-Selection Screening is the phase in which the search for the perfect package starts. There are many ERP packages available, and it is too hard to select the required package from these large amounts of packages. Hence the company should go for a pre-evaluation screening to limit the number of packages. The evaluation process is one of the most important phases of the ERP implementation because the package which is selected will decide the success or failure of the project.

Project Planning Phase designs the implementation process. This phase gives a clear and realistic plan for the process. This comprises scheduling timelines and deadlines for projects, identifying roles and assigning responsibilities for the ERP implementation process. The most crucial phase in the success of the ERP implementation is gap analysis. This is the process through which companies create a complete model of where they are now and where they want to beheaded. Reengineering involves many changes and modification in the number of employees and job responsibilities. Customization is the main functional area of the ERP implementation. Configuring a company's system reveals not only the strengths of a company's business process but also its weakness. Customization saves time and money.

At the same time that the customization is taking place, the implementation team is being trained, not so much on how to use the system, but how to implement it. This is the phase where the

company trains the employees to implement the system. The test cases must be designed precisely to find the weak links in the system and these bugs should be fixed before going live.

Going Live is the phase where ERP is made available to the entire organization. Once the system is live, the old system is stopped and the new system is used for doing business. Now, the actual users of the system will be given training on how to use the system. Post-Implementation (Operation&Maintenance) is a very critical phase. To acquire the full benefits of the ERP system, the system should get enterprise-wide acceptance. There should be enough trained employees to handle the problems that might crop up. The system must be upgraded immediately new versions or new technologies are introduced.

VENDORS

Vendors are the people who developed ERP packages. They are the people who have invested huge amounts of the time and effort in research and development to create the packaged solutions. Today's ERP packages have features and functionality to cater to the needs of businesses in almost all sectors. Some of the world's largest ERP vendors are SAP, SSA Global, PeopleSoft, Oracle Corporation and J.D. Edwards.

KEY ADVANTAGES OF ERP FOR TEXTILE INDUSTRY

i) Streamline Manufacturing Process
ii) Improved Data Quality
iii) Cost Reduction
iv) Provide Financial Data and MIS Reporting
v) Provide help to Manage Inventory

BARRIERS

The main barriers to implement an ERP system are:

- Resistance to change
- Lack of top management support
- Inadequate user training and education
- Inaccurate data
- Mismatch between the system capabilities and the organizations processes and procedures

Some of the other issues are cost, having right project team, lack of a clear view of the function of ERP.

CRITICAL SUCCESS FACTORS

The success of project implementation depends on the critical success factors such as:

- Top Management Support
- Organizational Culture
- Vendor Support
- Training
- User Involvement
- Business Process Reengineering

SUCCESS STORIES

1. Maharaja Shree Umaid Mills Limited, Rajasthan , India

They are the producers of Yarns and Fabrics for 70 years. Now they are using ERP software, SAP in Finance & Controlling, Plant Maintenance, Materials Management and Quality Management.

Business challenges	Solution
• Complex production planning execution • Huge product variants • Fabric division • Fluctuations in the procuring of Raw Materials. • Low manufacturing price • High quality product	• Cotton mixing program to get the homogenous mix • Stringent and user friendly production planning mapping • Flexible discount procedure methods • Bail packing program • Program to handle the dyes & chemical consumption

SAP helps them in achieving high quality of finished product, grade clarity in the material stocks at different stages, complete accountability of raw materials, dyes and chemicals and visibility to management in operational performance and increased efficiency.

2. Krishna Group of Industries (since 1977)

Before ERP	After ERP
○ Single knitting industry ○ 90% work manual ○ Inaccurate data fed ○ Both incorrect and missing entries. ○ Leakages	○ 19 locations ○ Net worth - Rs. 2,500 crores ○ Cut manufacture cost ○ Improve efficiency ○ Improved product customization ○ Quality assurance

CONCLUSION

Implementing ERP is not just a software installation. It is a team mission. It should be viewed as a team project for the success of the organization with a greater vision. Companies must include all employees on the concept of ERP for it to be a success. A successful implementation means involving, supervising, recognizing and retaining those who works closely with the system. Team work and a positive attitude and a keen interest on change for better are quintessence for a successful ERP deployment in an organization. An effective and efficient ERP system can reduce inventory, production, shipping, labor and IT maintenance costs and thus take the organization to greater effectiveness and a better competitive edge in terms of better strategic initiatives and responsiveness to customers. The ERP system improves the employee efficiency as data and information could now be captured and updated at one point with no duplication of effort. Greatly improved communication and corporation from all departments result in operational efficiency. Due to online updates on inventory levels on-time products delivery can be made. Failure to implement the ERP system application or delay in the process will affect the growth of the industry which results in a heavy loss in terms of finance, time and resources. A delay in the implementation of ERP is not only a failure

for that organization itself, but it is a failure for the growth and development of the entire apparel industry. It meanderingly affects society and the growth of the nation. ERP is an incredible managerial tool that provides with nearly everything that is needed for the right direction and compass for the organization. It helps the mangers with the resources to define strategies, checkpoints and finally help them evaluate and implement measures to drive them and the organization for a better profitability and success.

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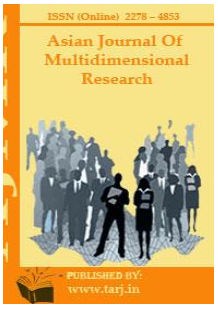

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INDUSTRY 4.0 AND GREEN HRM PRACTICES: INITIATIVES BY ORGANIZATIONS IN INDIA

Ms. R. Sreeprabha*; Ms. R. Sona**

*Assistant Professor,
GRG School of Management Studies,
PSGR Krishnammal College for Women,
Coimbatore, Tamil Nadu, INDIA

**Assistant Professor,
GRG School of Management Studies,
PSGR Krishnammal College for Women,
Coimbatore, Tamil Nadu, INDIA

ABSTRACT

A growing concern for environmental issues and sustainable development has been evolving among the developed and developing nations. Innumerable initiatives have been taken to determine how organizations are going to evolve ideas innovatively. Green HRM is the practice of implementing the HRM policies for the sustainable development of organizations. The study is done to investigate the present level of sustainability and environmental performance activities adopted by organizations in India to achieve economic development. The study also strives to suggest few corrective actions recommended for reducing the environmental damage, foreseeing the needs of the future generations. In this juncture of adopting Industry 4.0 implementing the Green HRM practices would help the nations move hand-in-hand towards protecting the environment.

KEYWORDS: *Industry 4.0, Green HRM, HR practices, sustainable development, environment damage*

INTRODUCTION

Human Resource Policies are the set of guidelines which an organization is intended to follow in order to manage the human capital. Changing environmental concern and the development of industry 4.0 are creating a necessity for the business to adopt best environmental strategies (Daily and Huang, 2001). Presently all the individuals are well aware of the concept of Go Green or Green HRM. But the ironical part of this issue, individuals are unclear of how and where the idea has to be implemented or from where the process/procedure has to be commenced. Unless safeguarding the natural environment for sustainable development doesn't become a rule, people are less likely to

follow the practices of protecting our environment for future generations. With the emergence of Industry 4.0, the younger generations are moving faster towards the era of technology, and automation. Further studies argue that the green management initiatives can be adopted only when they are able to set up a work environment with right skills and right competencies of individuals. Hence the organizations has to move a step ahead in designing a Green HRM model from the time the individual joins the organizations till the time they leave the organization.

OBJECTIVES OF THE STUDY

The study attempts

- To understand the evolution of green HRM concept over years.
- To throw light on various noteworthy works on green HRM by researchers.
- To elaborate green HRM practices adopted by few Indian companies.
- To brief on various green HRM practices that can be adopted by organizations to build a Green workplace.
- To suggest some green initiatives for HR to sustain in the era of fourth Industrial revolution.

RESEARCH METHODOLOGY

The study is based on the secondary data collected from various literature related to the topic from various databases, websites and other available sources. A methodical review of collected literature was also done in detail.

INTRODUCTION TO GREEN HRM

Industry 4.0 has emerged as a key drive for sustainable development worldwide where the execution of activities can be done through automation and exchange of data in manufacturing technologies. Blending Green HRM with Industry 4.0 allows the creation of innovative jobs and enterprises, promoting the infrastructure development, the protection of our cultural values and heritage, and export oriented earned revenues. Bearing in mind the initiatives taken to protect the environment everywhere, the HR managers too have the responsibility to create awareness among the present generations in the organizations about the concept of Green HRM. Hence different measures have been taken, like the optimum utilization of the resources, reducing the wastage, effective treatment of the wastage etc., thereby retaining the natural resources for sustainable development.

Green Human Resource Management (GHRM) creates an option to link organization with the government practices in implementing the ISO 14000 standards and environmental performance index (in collaboration with the World Economic Forum). To support this, the figure illustrates about the level of environmental performance of Top 10 –World Biggest economies for 2019-2020 has been considered (www.focus-economics.com)

Country	EPI Ranking	Environmental Performance Index	Environmental Health	Ecosystem Vitality
USA	27	71.19	93.91	56.04
China	120	50.74	31.72	63.42
Japan	20	74.69	92.99	62.48
Germany	13	78.37	88.68	71.50
UK	6	79.89	96.03	69.13
India	177	30.57	9.32	44.74

Source: 2018 EPI - https://epi.envirocenter.yale.edu/epi-topline

To interpret this table, India even though performing well in the stage of Nominal GDP in USD Trillion, 2.935 in 2019 and 3.304 in 2020 (www.focus-economics.com) having 6th ranking, the environmental performance index of India ranks only in the 177th position. This is an alarming tone for India to take necessary measures in protecting our environment leading to sustainable development.

LITERATURE REVIEW

- Douglas Renwick, Tom Redman, and Stuart Maguire (2008) in their article ***"Green HRM: A review, process model, and research agenda"*** proposes a new approach and presents a cohesive view in Green HRM, from the entry process to the exit processes in HRM i.e. recruitment to exit. This reveals that the HR managers play an important role translating Green HR policy into practice. This article focuses on bringing out the underlying literature in area of Green HRM, mapping the ground principles, and in offering a newly designed process model and research agenda in Green HRM. The study included interviewing the participants in Green HRM to ascertain the details of HR initiatives in Environmental Management, and those opinions regarding their level of motivations, feelings and commitment towards them as initiatives, and their willingness to be involved in them. It focused on conceptualizing the role behavior, i.e. Organizational Citizenship Behavior (OCB) in terms of Green HRM behaviors.
- Asha Nagendra and Sugandh Kansal, (2015) in their article titled "***Reducing Carbon Footprint through Green HRM"*** state that Green HRM involves the practices that promote the sustainable utilization of the resources. This Case Based Research paper tries to identify the green initiatives taken by the organizations from different sectors like IT Services, Aviation, FMCG, Cloth industry, Communication, Telecom and Beverages. The findings of the literature review suggest that companies are realizing the value of protecting the environment and started implementing Green HR policies to reduce carbon footprint. Suggestions were also given regarding upbringing the green policies by switching to audio and video conferencing thereby reducing travel modes, going paperless, shut down desktop after work for the day, waste management, green building, training program to increase the awareness of clean environment, recycling, alternate fuel etc.
- Suhaimi Sudin, (2011) in their article titled, "***Strategic Green HRM: A proposed model that supports Corporate Environmental Citizenship"*** have discussed the growing need for strategic green HRM for the integration of environmental management to HRM. The main purpose of the study is to find out the alternative constructs of developing green HRM. This paper suggests on the development of a new model of strategic green HRM and proposes that HR interventions will contribute to the effective implementation of EMS and the development of Green Intellectual capital and in-turn contributes to the achievement of Corporate Environmental Citizenship.
- Stock and Seliger, (2016) in their article titled ***"Opportunities of Sustainable Manufacturing in Industry 4.0"*** state that Industry 4.0 provides immense chances for the realization of sustainable manufacturing. This purpose of this paper is to find out the means of setting up smart factories, smart products and smart services embedded in an internet of things and about services called as industrial internet. The macro and micro viewpoints of Industry 4.0 are visualized and analyzed. Consequently, different methods to sustainable manufacturing are combined with the requirements of Industry 4.0, providing of equipment as a specific opportunity for sustainable manufacturing are discussed.
- Masri, and Jaaron, (2016), in their article **"Assessing Green Human Resources Management practices in Palestinian manufacturing context: An empirical study"** state that reinforcing

practices of environmental sustainability and improving employee's commitment on protecting environmental development in HRM practices is referred as Green HRM. It takes into account the values of Environmental Management (EM) in Human Resource (HR) initiatives applied to produce better efficiencies and good Environmental Performance (EP) which can facilitate reducing employees' carbon footprints. The identified practices were taken into the green aspects of recruitment and selection, training and development, performance management system, recognition and pay scale, employee participation, and organizational culture management using the designed GHRM survey. The data was collected from organizations that have implemented GHRM practices at different levels. A model was developed by linking the vital practices of GHRM that can be integrated in workplace.

- Fabian Hecklaua, Mila Galeitzkea, Sebastian Flachsa, and Holger Kohlb, in their study "***Holistic approach for human resource management in Industry 4.0"*** tries to understand the knowledge and the competency level and challenges faced by the employees in relation to the technology and processes in Industry 4.0 needed in manufacturing companies. The challenge is to qualify the employees to make them learn their capacities in order to manage with the changed workspaces with complex process and also make sure that they are retaining the employees in this changing work environment. A strategic approach for employee qualification has been described in this paper.

GREEN HRM PRACTICED IN INDIAN COMPANIES

Considering the above statistical data, every organization in India should take an initiative to encourage the employees to adopt the practices in Green HRM. This will in turn make them aware of utilizing the natural resources around us in a more economical way and reassure that all of them use eco-friendly products.

A few companies' initiatives have been studied over here to understand how well the Green HRM is practiced. Human Resource Departments plays an important role in mediating the importance of Green initiatives to the employees. It can be done through incorporating a few changes in mission statement, organizational policies, HR policies etc. Accordingly classifying this need on the basis of protecting the environment, four kinds of pollution is prevailing. Towards this clean HR, policies can be formulated considering these pollutions such as are air pollution, noise pollution, land pollution and water pollution. Business and Society is thus likely to align. The following forecast can visualize the progression into the environment conscience.

2010	2012	2013	2018	2020
The London Carbon Trading Exchange by UK	US signs the Kyoto II agreement and becomes a leading advocate for actions to reduce the rate of global warming	India, a key player in the CSR initiatives focusing to preserve the Indian culture, heritage and environment	Petrol-powered cars outnumbered by hybrid/ fully electric cars	A group of scientists have endorsed that the level of global warming is slackening

Source: PWC Report: Managing tomorrow's People

I. Telecom Industry

Bharti Airtel is the India's largest telecommunication company, in the year 2017 issued the Sustainability Report that summaries their approach towards sustainable business practices creating a positive impact on all the stakeholders.

The Green Initiatives taken by Airtel focused on reducing the carbon dioxide emissions during the year of 2015-16 and going paperless. As an initiative from the part of HR managers about 1280 million sheets were saved which was being used for the billing purpose. Adopting Aadhar card for verification purpose was adopted and 2400 tonnes of e – waste, revamped over 500,000 direct-to-home set top boxes. The HR managers also focused on serving the society as a part of community services by initiating educational programs for around 254 Satya Bharti School Program, Learning Centers and Quality Support Program including 198,000 underprivileged children cumulatively. In addition, IFFCO-Kisan Sanchar Ltd was launched which adopted mobile based agriculture awareness. Recruitment through career fairs was also implemented and launched Airtel Payments Bank, the first payments bank in India. This enabled over 1000 villages to go cashless across India, through enabling Airtel Payments Bank and accept digital payments

II. Banking Industry

ICICI Bank, the HR managers as an initiative towards Green HR initiatives focused on implementing practices where all levels of managers and the employees are rewarded for the ideas to bring up Green HR practices. Through this approach, the employees will take a way to encourage and indulge customers to go for green products which involves green vehicle loans and green home loans.

HDFC Bank was awarded for its "Resource Efficiency" efforts such as implementing motion sensors to switch off lights in unoccupied rooms, emphasize usage of reusable cups and plates, and installing the washrooms with proximity sensors; ICICI has been convened for the "Gold Category" recognition at Energy and Environmental Foundation Global Safety Awards 2017 for their constant efforts encouraging safe work practices across operations. Greening of Exit process is done to gather information about greener reforms being made in the organization, legal protection for green whistle blowers has also been adopted, and also the employees' perceptions about taking a green turn are also collected henceforth.

III. Information Technology Industry

TCS (Tata Consultancy Services) continues to prove its strong base from the day one to till date in having the responsibility towards the society by way of initiating Green HR practices throughout. It continues to focus having a strong emphasis on the societal needs and in recent years TCS also has addressed environmental and climate change issues with increased significance on bringing up a sustainable environment for future generations. TCS focuses on integrating the objectives of sustainability into its business operations especially in a world where everyone is shifting towards Industry 4.0. Indeed, all the new facilities and campuses in TCS ensures eco-friendliness, through using local materials, harvesting rain water and increasing the use of technology to reduce energy consumption, and use more natural light, ventilation and natural products. TCS has structured the governance for sustainability for governance of environment by creating the environment policy, an organization structure with a new role Head Health Safety Environment Develop the HSE procedure manual, provide safety engineers at construction sites, starting up vermin culture activity at all new facilities and introducing rainwater harvesting and also implementing institute energy audits. TCS also focuses on managing electronic waste by ensuring that the disposal is done through government certified disposal vendor and donate computers to extend its life of use. TCS has created green buildings at its facilities and the awareness on the increased environmental consciousness across the organization has resulted in a reduction in air travel within the company, an 8% drop in electricity consumption, and lower paper and printer cartridge utilization.

IV. FMCG Industry

Hindustan Unilever Ltd (HUL) a major FMCG company delivering product and product lines across countries is also committed to operate and grow its business in a socially responsible way. HUL has embraced the Unilever Sustainable Living Plan (USLP), which is the blueprint for sustainable growth. With respect to the emission of the Green House gases from manufacturing several initiatives have been implemented. In 2017, HUL reduced CO_2 emissions per ton of production by 54% compared to 2008. HUL focused on motto "Load More Travel Less" focused on selecting the right type of truck to maximize the utilization of the truck type and introduced CNG trucks in few regions thereby lead to reduction in movement of trucks. Reducing greenhouse gas emissions from refrigeration was launched for the first time in the industry in India that could roll out environment friendly freezer cabinets that use hydrocarbon (HC) refrigerants instead of Hydrofluorocarbons refrigerants for reduced energy consumption in offices by the installation of Ultraviolet system for air handling units. Reduce employee travel for conferences and by arranging conference rooms that has been enabled with audio and video for Skype group meeting thereby reducing the impact of employee travel on the environmental footprint.

GREEN HRM INITIATIVES FOR INDUSTRY 4.0

Conservation of energy

Organization's effort to provide more eco-friendly services, around the world has implemented various energy conservation initiatives to bring down the environmental issues. Energy Conservation in work place has the possibility for a great environmental impact. The HR department implies to start a campaign where the employees are induced to turn off light, PCs and TVs when leaving, also to use renewable energy to the maximum extent and introduced solar lighting (Davies & Smith, 2007), the travel policy can promote car sharing and the increase use of public transport (Simms, 2007). HR systems can include e-HR facilitate management and employees to track their own carbon emissions (Beechinor, 2007).

Green building

In recent years, organizations foresee a great urge for adoption of green buildings at a fast pace. Round the globe all the organizations consider their workplace to be green buildings as the alternative to traditional offices. The business organizations are now aware of the importance of green buildings and are ready to deal with environmental issues. Green buildings accomplish certain principle to reduce the exploitation of natural resources which are being used in construction. It also appreciates various vital features related to green practices like renewable energy, power efficiency and water management. Green buildings provide organizations a platform for financial savings as the construction and engineering absorb low cost.

Paperless office

Paperless office refers to the work place where usage of paper is restricted by automation of workflows. With introduction of IT the companies reduced the consumption of paper and also facilitate reducing the costs of paper-related actions such as copying, printing, and storing**,** and even enable saving time used for investigating paper documents. Today E-business and learning enabled organizations are converting their work place as paperless offices. Jamie Garratt initiated Idea Rebel, a digital agency with Vancouver base in 2008, which is an absolute paperless office (Borzykowski, 2013). At Idea Rebel, all the pay stubs are emailed and notes are taken on whiteboards. Reducing the

use of paper, can directly conserve natural resources, prevent pollution, and also protect environment by reducing wastage of water and energy.

Recycling and waste disposal

Recycling brings down the use of raw materials by processing the used materials. Recycling is a method to process and convert the used up materials (waste) into new products. This practice therefore saves energy by reducing huge waste, making the environment cleaner. Many organizations as a part of their green initiatives, strives to implement recycling awareness programs and training to bring down the waste increase the number of recycled products. HR professionals determine the concept green workplace and green initiatives plays a vital role in overall corporate social responsibility. In recent years, corporates round the globe recite three R's mantra "Reduce, Reuse, and Recycle" to save the environment.

CONCLUSION

The study embarked different measures taken by various organizations in India to implement GHRM in the era of fourth industrial revolution enacted with Artificial Intelligence, Machine Learning and internet of things. India being a developing nation many organizations is still striving to achieve their economic objectives and their performance goals. However, companies implemented GHRM concentrate on the employees, focusing on the recruitment and selection, training and development, performance management and appraisal, reward and compensation, employee empowerment and participation, and the management of the organizational culture. The study also comprises various research works on how these can be managed from a "green" perspective levels.

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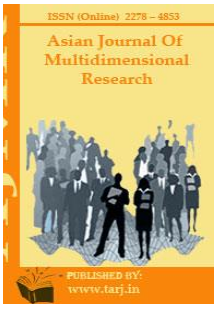

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CONSUMERS' ADOPTION OF DIGITAL BANKING SERVICES: AN EMPIRICAL ANALYSIS

Dr. Savitha Nair*; Ms. Ponnila Harshavardhini NA**

* Associate Professor,
GRG School of Management Studies,
PSGR Krishnammal College for Women,
Coimbatore, Tamil Nadu, INDIA

**PhD Research Scholar,
Department of Management,
PSGR Krishnammal College for women,
Coimbatore, Tamil Nadu, INDIA

ABSTRACT

Today, almost all the banks of the country are offering digital solutions enabling consumers to undertake banking transactions with ease and convenience.This paper examines the factors influencing consumers' adoption of digital banking services. The study examines consumers' level of awareness of digital solutions offered by their bankers, rate of adoption, challenges faced and satisfaction towards the banker based on the digital experience. The impact of factors influencing the adoption of digital banking services on the rate of adoption is measured in order to arrive at meaningful conclusions. A sample of 100 respondents was taken from Coimbatore city and a validated questionnaire was distributed for the purpose of data collection. Descriptive statistics and regression analyses were conducted to analyze the responses and test the hypotheses. The results indicate the extent of impact of independent variables on consumer adoption. The study provides insights to the bankers in fine-tuning their digital service strategy in order to reduce the challenges and increase the level of consumer adoption.

KEYWORDS: *Digital banking, Consumer adoption, Awareness, Banking Sector*

INTRODUCTION

Banking sector across the globe has witnessed lot of innovations towards improving process efficiency and customer experience over the past few decades. The recent and the most prominent one is digital banking, which involves the offer of banking services using the power of internet. The associated technologies include automation and web-based services which help bankers to deliver bank products and enable banking transactions with more speed, accuracy and convenience.

Consumers of today seem to adopt such services more than ever before. With the ushering in of the fourth industrial revolution coupled with intense competition and enhanced customer expectations, banks are relying heavily on technology to reduce cost, increase process efficiency and elevate customer experience.

The earliest forms of digital banking started in 1960's with the advent of ATMs and cards. In 1990's, online banking started to take off with the power of internet. From 2000, modern digital banking technologies started to emerge. The smartphone revolution widely opened doors for banking transactions beyond ATMs. Bankers started using sophisticated software applications for core banking, managing customer relations, resource planning etc. CRM (Customer Relationship Management) software enable bankers to acquire, keep and grow their customers by building and maintaining customer database, data mining, analytics and thereby deploying appropriate strategies. Communicate with customers directly from the bank and make their customer to retain with them. While over 63% of the customer using smartphones for their banking purposes, mobile apps with efficient customer interface are built to reap the benefits of digitalization.

This study is undertaken to analyze the factors influencing customer adoption of digital banking services. Consumers' awareness about digital banking and challenges faced during adoption is also analyzed to arrive at meaningful conclusions. The study provides insights to the bankers in fine-tuning their digital service strategy in order to reduce the challenges and increase the level of consumer adoption.

REVIEW OF LITERATURE

Sathye (1999) studied the adoption of internet banking among Australian consumers comprising of individuals and firms and found that security concerns and lack of awareness were the major obstacles in adopting internet banking. Organizational reputation, relative advantage and perceived risk are found to have significant influence on customers attitude and behavior towards e-service (Ruyter et al., 2001). A study on the customer adoption of telebanking technology in Saudi Arabia reveals that consumers' income levels and education play a vital role in their adoption and usage of such technologies. Consumers increasingly use tele-banking as their experience grows with the system (Al-Ashban and Burney, 2001).

Jane et al., (2004) analyzed the adoption of electronic banking technologies by US consumers. They found that relative advantage, complexity / simplicity, compatibility, observability, risk tolerance and product involvement were associated with adoption. Demographic variables such as income, gender, education and marital status impacted adoption. Adoption also changed over time. Tommi (2004) customer value perceptions in internet and mobile banking. He found that efficiency, convenience and safety were important in determining the differences in customer value perceptions between internet and mobile banking. Michal and Tomasz (2009) conducted empirical analysis of internet banking adoption in Poland. With a survey being done on 3519 Polish internet users, the researchers found that perceived levels of security on internet transactions impacted the decisions to open online bank accounts. Experience with internet and certain demographic variables strongly predicted user adoption status.

Hanna and Willy (2014) studied the factors affecting the adoption of mobile banking in Kenya commercial bank. They found that finds that customers' perceived risk negatively affected adoption of mobile banking services and the adoption was below the target. Perceived convenience, usefulness, trust and relative advantage positively impacted the adoption of mobile banking services.

Sanjit et al., (2017) in their study on internet banking adoption found that perceived ease of use and external risks determined how well internet banking is accepted by consumers.

OBJECTIVES AND HYPOTHESES OF THE STUDY

The primary objective of the study is to measure the impact of factors influencing the adoption of digital banking services by consumers with special reference to Coimbatore city. The researcher also intends to analyze the rate of adoption and the challenges faced by the consumers while adopting the digital banking services. Based on the literature review, the factors influencing adoption have been taken from Roger's Diffusion of Innovation theory (2003). The factors are relative advantage, compatibility, trialability and complexity.

Relative advantage refers to the degree to which an innovation is perceived to be better than the idea it supersedes. Compatibility refers to the extent to which an innovation is perceived as consistent with the values, experiences and needs of the potential adopters. Trialability is the degree to which an innovation can be experimented on a limited basis. Complexity is the degree to which an innovation is perceived as difficult to understand and use. To meet the research objectives, the following hypotheses have been framed for the purpose of the present study:

- H_1: Relative advantage will have a significant positive influence on consumer adoption digital banking services
- H_2: Compatibility will have a significant positive influence on consumer adoption digital banking services.
- H_3: Trialability will have a significant positive impact on consumer adoption of digital banking services.
- H_4: Complexity will have a significant negative impact on consumer adoption of digital banking services.
- H_5: All the independent variables will together predict consumer adoption significantly.

RESEARCH METHODOLOGY

The research is descriptive in nature. The data was collected from a sample of 100 consumers of digital banking services residing in Coimbatore city. Simple random sampling was adopted for data collection, as the researcher prepared the survey questionnaire in Google Form and mailed it across using various digital platforms. The rate of adoption and significance of relationship between variables were analyzed by surveying the respondents using a validated questionnaire. The items to measure the constructs were taken from literature and measures using 5-point Likert's scale. The statistical design includes frequency distribution, descriptive statistics, ANOVA and regression analysis.

DATA ANALYSIS

The demographic profiles of the respondents are shown in Table 1. The results show that 56 % of the respondents belong to the age group of 21-30 years. 80 % of the respondents are women. 44 % of the respondents are working and salaried. Annual family income of majority of the respondents (30%) is between Rs. 1-3 lakhs. 52 % of the respondents hold Master's degree and 52 % are married. 70 % of the respondents are living in urban areas.

TABLE 1: DEMOGRAPHIC PROFILE OF THE RESPONDENTS

Variable		Frequency (N=100)	Percent
Age (in years)	Below 20	2	2.0
	21-30	56	56.0
	31-40	20	20.0
	41-50	12	12.0
	51-60	8	8.0
	Above 60	2	2.0
Gender	Male	20	20.0
	Female	80	80.0
Occupation	Student	32	32.0
	Salaried	44	44.0
	Self employed	4	4.0
	Retirees	20	20.0
Annual Family Income	Up to Rs.1,00,000	26	26.0
	Rs. 1,00,001 –Rs.3,00,00	30	30.0
	Rs.3,00,001-Rs.5,00,000	28	28.0
	Rs. 5,00,001-Rs.7,00,000	10	10.0
	Rs.7,00,001-Rs.9,00,000	6	6.0
Education	Bachelor's	36	36.0
	Master's	52	52.0
	Others	12	12.0
Marital status	Married	52	52.0
	Unmarried	48	48.0
Residential location	Urban	70	70.0
	Semi-urban	26	26.0
	Rural	4	4.0

(Source: Primary data)

Table 2 depicts the digital banking usage and background of the respondents. The results indicate that 74 % of the respondents are using digital banking services offered by their bankers. Majority of the respondents (34 %) are the customers of SBI, followed by IDBI Bank and ICICI Bank.

TABLE 2: DIGITAL BANKING ADOPTION BY THE RESPONDENTS

Digital Banking		**Frequency (N=100)**	**Percent**
Usage	Yes	74	74.0
	No	26	26.0
Banker	SBI	34	34.0
	Bank of India	4	4.0
	ICICI Bank	11	11.0
	HDFC Bank	6	6.0
	Punjab National Bank	2	2.0
	Axis Bank	8	8.0
	Canara Bank	9	9.0
	Union Bank	5	5.0
	Bank of Baroda	1	1.0
	IDBI Bank	13	13.0
	Others	6	6.0

(Source: Primary data)

Table 3 depicts the challenges faced by the customers while adopting digital banking. The most important challenge faced is safety and security issues and concerns (35.2 %) followed by technical issues (22.5 %) and traditional banking habits (15 %).

TABLE 3: CHALLENGES FACED BY THE RESPONDENTS

Digital Banking Challenges	Frequency	Percent
Traditional Banking Habits	34	15.
Safety and security issues	80	35.2
Technical issues leads to uncertainty	51	22.5
Poor accessibility towards digital outlets	22	9.7
Technological anxiety	21	9.3
Lack of required knowledge	15	6.6
Others	4	1.8

(Source: Primary data)

The mean values and standard deviations of the constructs of the study are presented in Table 4. It may be observed that for all the positive constructs, the mean values are close to 4 and for the negative construct (Complexity), the mean value is 3.35. The mean value of adoption is 4.065, indicating a good rate of adoption among the respondents. Among the factors influencing adoption, the highest mean value is for the construct 'trialability' (Mean= 3.74). The results indicate that there is a near agreement on the importance of the constructs identified for the purpose of the study.

TABLE 4: DESCRIPTIVE STATISTICS

Construct	Mean	Standard Deviation
Relative Advantage	3.7200	.75819
Compatibility	3.6950	.79342
Complexity	3.3533	.98794
Triability	3.7400	.84298
Adoption	4.0650	.80058

(Source: Primary data)

To meet the research objectives and to test the hypotheses framed for the study, the regression analyses have been conducted. The influence of independent variables on consumer adoption of digital banking services is analyzed. The results indicate that there is a significant positive influence of relative advantage and trialability on consumer adoption (P<.05). However, there is no significant impact of compatibility and complexity on consumer adoption (P>.05). The hypotheses H_1 and H_3 are accepted and H_2 and H_4 are rejected. The construct relative advantage has more significant influence on consumer adoption (B=.875).

TABLE 5: REGRESSION ANALYSIS OF CONSTRUCTS

Regression	B	t	Sig
Relative Advantage→Adoption	.875	7.301	.000
Compatibility →Adoption	.243	1.639	.105
Complexity →Adoption	-.019	-.380	.705
Triability →Adoption	.317	3.314	.001

(Source: Primary data)

The influence of all the independent variables on the dependent variable is tested using Anova. The results indicate that all the independent variables together predict the dependent variable significantly (P<.05). The adjusted R^2 value is .720 indicating that 72 % of the variability in the dependent variable is predicted by the independent variables. Hence the model has a good fit and H_5 is accepted.

TABLE 6: ANOVA AND MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.855[a]	.731	.720	.42364

(Source: Primary data)

CONCLUSION

The results obtained from the study help us to understand the factors influencing consumer adoption of digital banking services, the extent of adoption and the challenges that may prevent consumers from adopting such services. When the consumers believe they have necessary skills and abilities to do digital banking with increase in technological improvements, it affects the digital banking in a positive way. Further, the study measures the impact of independent variables such as relative advantage, and compatibility, complexity and trialability on adoption. The results can give insights to the bankers on the importance of having the best features in the digital platforms for better customer adoption and experience. The sample size of the study is limited, hence a detailed study with a larger sample size and wider geographic coverage can add to the scope of the study in future.

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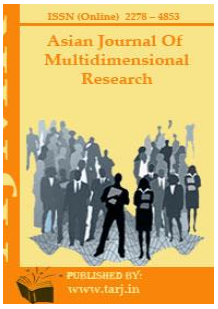

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ARTIFICIAL INTELLIGENCE IN INDIAN HEALTH CARE

Ms. R. Maheswari*; Dr. S. Kavitha**

*M Phil Research scholar,
Department of Management,
PSGR Krishnammal College for Women,
Coimbatore, Tamil Nadu, INDIA

**Associate Professor,
Department of Management,
PSGR Krishnammal College for Women,
Coimbatore, Tamil Nadu, INDIA

ABSTRACT

Healthcare imagines a world where each and everyone are connected through smart clothes (used to monitor heart rate) and patient's data gets recorded for future combinations. This may sound unreal, but thanks to artificial intelligence this is possible. Artificial intelligence is used worldwide for three medical tasks: diagnosis, prognosis, and therapy but in India is primarily used only for diagnosis. This paper dwells on the important dimensions of service quality in the health care sector and tries to explore the benefits the sector will reap due to the adoption of Artificial Intelligence. Artificial Intelligence in health care can extract information, process and present an output by itself. This ability of Artificial Intelligence can be used to develop prevention techniques while predicting patient outcomes with maximum accuracy. This can also aid in enhancing the efficiency of the health care provider and also improve consumer (patient) satisfaction. There is no denying that by the adoption of Artificial intelligence, service quality can be improved in the health care sector. Though India with an ever-growing population and 1:1000 doctors to patient ratio is perfect for the adoption of Artificial Intelligence there are various challenges in its implementation. The paper provides an overview of the role of Artificial Intelligence in health care and the implications it can have on the service quality.

KEYWORDS: *Artificial intelligence, Service quality*

INTRODUCTION

Industry 4.0 is already re-defining the way things were manufactured. It embraces automation of processes, data exchange and manufacturer technologies that are changing the landscape of how we

manufacture products and are expanding the boundaries of innovativeness involved in the production processes. It is modeled on a value chain organization that merges real and virtual worlds using the internet of things (IOT) and internet of service (IOS). It provides factories with real time intelligence allowing them to efficiently produce products of higher quality that can be completely customized. Industry 4.0 is a universal phenomenon spanning all sectors including health care. Before 5 years, the medical device connectivity market was largely unconsidered but now however it's currently expected to grow at a CAGR of thirty eight percent over the next 5 years by adopting the IOT. Hospitals are also changing the way in which they purchase equipment, working to optimize their costs in the "value based care mode". All of this combined with increased product complexity can impose great risk on the quality and requires investment in advanced technology to ensure there is no dearth in the quality of service provided to the public.

Health has been accepted as one of the fundamental rights in the Indian constitution and hospitals are the backbone of any health care delivery system. In the year, 1991 government of India initiated several economic reforms in the field of health care sector. However post liberalization, the sector attracted private capital and fresh investment that led to the establishment of many multi specialty hospitals and smaller nursing homes. Large company teams and charitable organisation brought non-public finance and there resources were endowed in trendy equipments and advanced technologies that have served to develop the nation's health infrastructure. Private sector entry in Indian health care has opened several doors for medical and paramedical personnel medical instrumentation, data technology in health services, BPO, telemedicine and medical health business. The objective of this article is to review the various literatures relate to the adoption of artificial intelligence in healthcare sector and its impact on the service quality provided to the patients.

SERVICE QUALITY

Service quality is the assessment of well a customer's expectation of service has been met. It is the product of effort of every member of an organization invested with the sole purpose of satisfying a customer. This is a major determinant of customer loyalty (Naidu, 2009) and hence has been studied widely by a lot of researchers worldwide. Reliability, responsiveness, assurance, empathy and tangibles are the dimensions of service quality. Though the concept of service quality is universal, it becomes more intricate in Health care.

Healthcare could be an advanced business that has varied stakeholders concerned like patients, caregivers, doctors, hospitals and pharmaceutical corporations. This business is additionally restricted by demanding rules and laws. At times, all this ends up in but adequate care accorded to patients and thus service quality in Heath care though crucial additionally becomes troublesome to achieve.

ARTIFICIAL INTELLIGENCE

Artificial intelligence (AI)- uses the computer algorithms to approximate conclusions without direct human input. Artificial intelligence uses algorithm and software to approximate human cognition in the analysis of complex medical data. It also analyzes relationships between prevention or treatment techniques and patient outcomes. Clinical call support systems (CDSS) were one among the primary flourishing applications of AI, focusing totally on the identification of a patient's condition given his symptoms and demographic info.

RECENT TRENDS IN AI

Recently AI techniques have sent large waves across care, even fuelling a vigorous discussion of whether or not AI doctors can eventually replace human physicians within the future. We believe that human physicians won't get replaced by machines within the predictable future, however AI will positively assist physicians to create higher clinical selections or perhaps replace human judgement in bound useful areas of care (eg, radiology). The increasing availability of healthcare data and rapid development of big data analytic methods has made possible the recent successful applications of AI in healthcare. Guided by relevant clinical queries, powerful AI techniques will unlock clinically relevant data hidden within the huge quantity of knowledge, that successively will assist clinical deciding. In this article, we have a tendency to survey the present standing of AI in care, further as discuss its future.

ADVANTAGES OF AI

The advantages of AI are extensively mentioned within the medical literature. AI Can use refined algorithms to 'learn' options from an oversized volume of attention knowledge, then use the obtained insights to help clinical apply. It can also be equipped with learning and self-correcting abilities to improve its accuracy based on feedback. An AI system will assist physicians by providing up-to-date medical info from journals, textbooks and clinical practices to tell correct patient care. In addition, Associate in Nursing AI system will facilitate to cut back diagnostic and therapeutic errors that square measure inevitable within the human clinical apply. Moreover, associate AI system extracts helpful info from an oversized patient population to help creating period of time inferences for health risk alert and health outcome prediction.

The experts are calling it Healthcare 4.0, which includes Analytics/AI and data provided by wearable (Internet of Things). Based on the knowledge provided by IoT at the side of advanced level of analytics, the business could improve the standard of aid provided to people. The market of wearable tech is getting very competitive indicating that the fundamental infrastructure is maturing to collect reliable patient information outside the patient testing environment.

IMPLEMENTATION OF AI IN 4.O

The implementation of I4.0 will definitely be a transformation method for the medical device trade attributable to the importance in holding compliance and therefore the have to be compelled to prove quality systems. Nevertheless, it can and should be planned into business strategies now and benefits will be realized over time. Modern MES platforms that utilize suburbanized logic give a sensible pathway to transitioning from native systems and paper- based mostly production models to the newest technologies whereas guaranteeing management of business method rules, managing compliance and reassuring internal control and high product quality.

Thus the implementation of Artificial Intelligence can have positive impact on the service quality provided by ensuring compliance to standards, reduction of medical costs, increased reliability, improved prevention techniques and patient outcome prediction. The advancement in technology positively impacts every sector but its impact on heath care sector will be most appreciated since high quality health service is a dream of every developing nation and is imperative for the future of a country and its people.

REVIEW OF LITERATURE

T. Vanniarajan & B. Arun (2007) in their article described about the measurement of the service quality in corporate and non-corporate health care centers. The important discriminate service quality factors among the two types of health care centre where atmospherics and supportive staffs. The study suggested the improvement of factors and formulation of suitable strategies for enhancing patient's satisfaction. It was concluded that service quality in corporate Health Care Centers was rated highly by the patients compared to the non-corporate Health Care Centers. Introduction of technology like artificial intelligence could certainly improve the infrastructure and resources of the public health care sector, thus ensuring low cost high service quality to all patients.

Col Abhijit Chakravarty (2011) in his article described about service gap between consumer expectations and perceptions about the hospital outpatient department. A cross-sectional study was conducted using SERVQUAL survey instrument. He concluded that significant service quality gaps existed within the delivery of the hospital Out Patient Department services.

Yesha Paul, et al (2017) in his report explained about the use of Artificial Intelligence automation of medical diagnosis, automated analysis of medical tests, detection and screening of diseases, wearable sensor based devices and monitoring equipments. The challenges to the use of AI on healthcare were identified through a review of literature, interviews and round table inputs. The challenges identified were on the factors such as data, design, development, implementation and adoption of Artificial Intelligence in Health Care Department.

Muhammad Shafiq, et al (2017) in his study developed a scale to measure the service quality on Asian Hospitals regardless of their nature and ownership. Data were collected from inpatients and outpatients at 9 different hospitals and the scale was developed using structural equation modeling on regard with reliability, tangibility, responsiveness, empathy and assurance. Data analysis was done using IBM SPSS version 20 and IBM AMOS version 20. This study evaluates the better understanding of patients regarding the services they received and then compared with their expectations. As this study indicated that the patients are not completely knowledgeable of the services delivered to them, further study could be done on the view point of health care providers.

Fei Jiang, et al (2017) in their article dealt with the survey of current status of Artificial Intelligence applications on health care and its future. Cancer, neurology and cardiology are the major disease areas that use AI tools. AI devices falls mainly into two categories- Machine Learning (ML) and Natural Language Processing(NLP). The IBM Watson system was a pioneer which includes both ML and NLP. The first problem found was regulations and the other was data exchange.

According to a report in the **Nuffield Council on Bioethics (2018)** Artificial intelligence was used for health and research purposes, including detection of disease, management of chronic conditions, delivery of health services and drug discovery. Both patients and healthcare professionals should trust AI systems. AI systems support people with chronic health conditions or disabilities which increase people's sense of dignity, independence and quality of life. Limitations were found on the quality of available health data.

RESEARCH IMPLICATIONS

The above reviews revealed that Artificial Intelligence is being adopted in Health care sector and it impacted the service quality dimensions of health care's capability to embrace change imposed during industry 4.0. The review helped the author to identify the need for conducting a survey in order to explore and identify dimensions that enhance the ability of hospitals embrace change. When patients are well aware of their new innovations of new technologies in equipments this will lead them in a positive way even during in challenging times. A hypothesis can be formulated to test whether adoption of Artificial intelligence significantly related to the enhanced service quality delivery. This can be tested by conducting an empirical study by collecting primary data from the patients and employees.

CONCLUSION

Tangibility Dimension is more important to achieve the better service quality. Industry 4.0 makes major role in machinery manufacturing industry obviously in health care. In this change every manufacturing industry should adopt new technology in every step to attain better profit. This paper discussed the use of artificial intelligence which helps the organisation to attain better service quality. In hospitals if we adopt artificial intelligence it would help to monitor patients in step by step for better precaution as per the Proverb "Prevention is better than cure" this suits artificial intelligence well.

Based on the reviews, it can be concluded that artificial intelligence is so helpful in attaining better service quality. But the Adoption of artificial intelligence equipments is a tedious task because of its high cost. In upcoming years, low priced Artificial intelligent equipments can be available in the market. Hence middle level health care organizations can also adopt those equipments and provide more efficient services to their customers/Patients.

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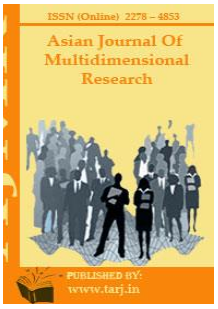

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HEALTH AND SAFETY AT WORKPLACE: A STUDY WITH SPECIAL REFERENCE TO THE TEXTILE INDUSTRIES OF NAMAKKAL AND ERODE DISTRICTS, TAMIL NADU

Mr. A. Karuppannan*; Dr. M. Maheswari**

*Associate Professor,
KSR School of Management,
K. S.Rangasamy College of Technology,
Tiruchengode, Tamil Nadu, INDIA

**Assistant Professor,
GRG School of Management Studies,
PSGR Krishnammal College for Women,
Coimbatore, Tamil Nadu, INDIA

ABSTRACT

Industry 4.0 will lead to developments in all the areas of management. It may reduce the workforce and at the same time, increase the quality of database in the area of human resources. It may create drastic changes in maintaining people in the organizations requiring people to be smarter than ever. This study focuses on the textile industries; particularly it covers the workplace health and safety of the employees. Industries nowadays are updating their assets like machineries, materials and service related to maintenance, using advanced technologies. Up gradation should also focus on the physical health of the employees by way of reducing pollution, noise and increase safety etc. An experienced employee in textile industry would have experienced the difference in the up gradation over years. Employees experience safety, physically as well as mentally, through the introduction of technology in their industry. In this study, 150 samples were collected and data was analyzed using the statistical tools such as percentage analysis, ANOVA, chi-square and regression. The result shows that the most of the employees feels safety after the introduction of modern machineries for the production process. The stress level of the employees had a significant relationship with the health and safe environment in the organization.

KEYWORDS: *Employees, Workplace environment, Mental stress, Health and safety*

1. INTRODUCTION

In India, textile industries play very important role in the contribution of economic development (Rahul B Hiremath, 2014). The textile industry provides employment opportunities to most of the rural and semi urban areas (Neelam Singh, 2016). The employees are facing more health and safety problems in this industry. In twenty-first century, the health promotion at work place is set as the highest priority by the World Health Organization (Desalegn Tetemke, 2014). The hazards and welfare measures are to be considered as the primary concern in textile industries. The physical, chemical, electrical, psychological are the hazards mainly focused in the process of textile industries. The first aid facilities, provision of quality water and food, safety equipment during work, clean sanitary facilities are the welfare facilities to be taken care for the wellbeing of the employees inside the organization (Faisal Hanan, 2014). Lack of awareness and training programmes leads to aggravate most of the occupational health problems. The adoption of advanced machineries and scheduled training to handle them reduces most of the health and musculoskeletal problems. The usage of safety measures is observed in all processes, which minimizes the various health issues faced by the employees.

2. OBJECTIVES OF THE STUDY

- To study the health and safety factors of employees in textile industries at Erode and Namakkal district.
- To learn the various health, musculoskeletal and psychological problems of employees in textile industries.

3. REVIEW OF LITERATURE

Karupannan, (2017) studied on safety training programme in textile industries. The employees in textile industries should focuses on the safety training through which they can develop the employees as well as organization. In textile industries the work is segregated into different units such as ginning, spinning, weaving, dyeing, garment industry, knitting and so on. Each unit has its own method of processing system; all employees should enrol in training programmes to learn all the process in each unit. The common physical hazards such as dust, noise, psychological problems, and ergonomics problems are identified and concentrated to reduce the hazards through the safety training programmes.

Neelam Singh, (2016) studied the safety and health issues in workers in clothing and textile industries, India. The conceptual study focuses on the different exposure to the textile industry workers. The exposure to cotton dust, noise, chemicals and working environment are the main factors considered by the researcher. The common occupational diseases identified are musculoskeletal disorders, carpal tunnel syndrome, hearing problem, low back syndrome, asthma, cancer. The researcher suggest that the employees should be aware on the safety and health environment at the same time management should keen in providing hazardous free environments to all its employees.

Ajeet Jaiswal, (2015) studied the Industrial Health Management and Safety issues in Textile industry. The researcher considered the workplace hazards, exposure to chemicals, noise, cotton dust, healthcare and ergonomic issues. After the detailed study, the researcher suggestsa few health, and safety conditions to be improved in textile industries namely maintaining machinery to reduce the noise and employees to wear earplugs while working with machines, job rotation, insisting

employees to wear masks, providing safety equipments at required place and free medical check up for all the employees at regular intervals.

Desalegn Tetemke, (2014) studied the knowledge and practices regarding safety information among textile workers in Adwa town, Ethiopia. Simple random sampling was used to collect data from 560 textile workers. Regression analysis was used as the statistical tool to analyse the sample collected. The analysis shows that 54.2 per cent of the respondents are female, 44.4 per cent of them had secondary level education, 47.5 per cent of them had 1 to 5 years work experience, 55.6 per cent of them were single in marital status, 73.3 per cent of the respondents were permanent employees, 89.2 per cent of the respondents belongs to production department. 69.5 per cent of the respondents are aware on the health and safety measures. The researcher found that there exists huge gaps between the awareness and usage of health and safety equipments at work place. Care should be taken by the management to train the workers to make use of the safety equipments during emergency.

4. RESEARCH METHODOLOGY

The descriptive research design is used with simple random sampling technique. A structured questionnaire was framed and data was collected from 150 employees working in Textile Industries in Erode and Namakkal district, Tamil Nadu. Data was analyed using simple Percentage Analysis, Analysis of Variance (ANOVA) and Chi-square analysis.

5. ANALYSIS AND INTERPRETATION

5.1 PERCENTAGE ANALYSIS

TABLE 5.1 PERCENTAGE ANALYSES OF THE RESPONDENTS

Demographic Factors		Frequency	Percent
Marital Status	Married	104	69.3
	Unmarried	46	30.7
Gender	Male	58	38.7
	Female	92	61.3
Age (years)	18 - 22	47	31.3
	23 - 27	66	44
	> 27	37	24.7
Educational Qualification	Illiterate	58	38.7
	School Level	78	52
	College Level	14	9.3
Experience(years)	<3 yrs	32	21.3
	3 – 5 yrs	47	31.3
	6 – 10 yrs	38	25.3
	>10 yrs	33	22
Employment Type	Permanent	71	47.3
	Temporary	79	52.7
Employment Sections	Ginning	25	16.7
	Spinning	37	24.7
	Weaving	25	16.7
	Dyeing	25	16.7
	Knitting	24	16

	Processing	14	9.3
Facility for first aid	Yes	95	63.3
	No	55	36.7
Facility for alarm during emergency	Yes	127	84.7
	No	23	15.3
Maintaining Separate storage space for chemicals	Yes	96	64
	No	54	36

From the table 5.1, among the total number of respondents 69.3 percent are married, 61.3 percent are female, 44 percent of the respondents' age group fall between 23 to 27 years, 52 percent of them have completed school level, 31.3 percent had 3 to 5 years as experience, 52.7 percent are temporary employees and 24.7 percent belong to spinning section. The industries are providing facility for first aid, alarm during emergency and separate storage space for chemicals.

5.2 ANALYSIS OF VARIANCE

Analysis of variance is performed for the musculoskeletal problems and adoption of modern machineries and psychological problems experienced by employees across the demographic factors.

5.2.1 ANOVA TEST OF EXPERIENCE AND MUSCULOSKELETAL PROBLEMS

TABLE 5.2.1 ANOVA TEST OF EXPERIENCE AND MUSCULOSKELETAL PROBLEMS

		Sum of Squares	df	Mean Square	F	Sig.
Lower back pain	Between Groups	8.963	3	2.988	2.524	.049
	Within Groups	172.830	146	1.184		
	Total	181.793	149			
Neck pain	Between Groups	3.078	3	1.026	.787	.503
	Within Groups	190.415	146	1.304		
	Total	193.493	149			
Knee pain	Between Groups	10.842	3	3.614	2.903	.037
	Within Groups	181.752	146	1.245		
	Total	192.593	149			
Shoulder pain	Between Groups	2.091	3	.697	.564	.640
	Within Groups	180.602	146	1.237		
	Total	182.693	149			
Hand pain	Between Groups	2.776	3	.925	.724	.539
	Within Groups	186.724	146	1.279		
	Total	189.500	149			

From table 5.2.1, it is inferred that there was a significant difference in lower back pain and knee pain among the different experience levels of the respondents.

5.2.2 ANOVA test of gender and musculoskeletal problems

TABLE 5.2.2 ANOVA TEST OF GENDER AND MUSCULOSKELETAL PROBLEMS

		Sum of Squares	df	Mean Square	F	Sig.
Lower back pain	Between Groups	.483	1	.483	.395	.531
	Within Groups	181.310	148	1.225		
	Total	181.793	149			
Neck pain	Between Groups	4.790	1	4.790	3.757	.045
	Within Groups	188.704	148	1.275		
	Total	193.493	149			
Knee pain	Between Groups	.114	1	.114	.088	.768
	Within Groups	192.479	148	1.301		
	Total	192.593	149			
Shoulder pain	Between Groups	.188	1	.188	.153	.697
	Within Groups	182.505	148	1.233		
	Total	182.693	149			
Hand pain	Between Groups	1.984	1	1.984	1.566	.213
	Within Groups	187.516	148	1.267		
	Total	189.500	149			

From table 5.2.2, it is inferred that there was a significant difference in neck pain among the different gender group of the respondents

5.2.3 ANOVA test of age and musculoskeletal problems

TABLE 5.2.3 ANOVA TEST OF AGE AND MUSCULOSKELETAL PROBLEMS

		Sum of Squares	df	Mean Square	F	Sig.
Lower back pain	Between Groups	7.336	2	3.668	3.091	.048
	Within Groups	174.457	147	1.187		
	Total	181.793	149			
Neck pain	Between Groups	2.555	2	1.277	.983	.376
	Within Groups	190.939	147	1.299		
	Total	193.493	149			
Knee pain	Between Groups	5.738	2	2.869	2.257	.018
	Within Groups	186.855	147	1.271		
	Total	192.593	149			
Shoulder pain	Between Groups	.249	2	.124	.100	.905

	Within Groups	182.444	147	1.241		
	Total	182.693	149			
Hand pain	Between Groups	1.169	2	.584	.456	.635
	Within Groups	188.331	147	1.281		
	Total	189.500	149			

From table 5.2.3, it is inferred that there was a significant difference in lower back pain and knee pain among the different age groups of the respondents.

5.2.4 ANOVA test of age and psychological problems

TABLE 5.2.4 ANOVA TEST OF AGE AND PSYCHOLOGICAL PROBLEMS

		Sum of Squares	df	Mean Square	F	Sig.
Stress	Between Groups	3.123	2	1.561	1.540	.218
	Within Groups	149.070	147	1.014		
	Total	152.193	149			
Depression	Between Groups	.268	2	.134	.101	.904
	Within Groups	195.972	147	1.333		
	Total	196.240	149			
Routine work	Between Groups	7.846	2	3.923	2.215	.013
	Within Groups	260.394	147	1.771		
	Total	268.240	149			
Heavy work load	Between Groups	4.356	2	2.178	1.654	.195
	Within Groups	193.538	147	1.317		
	Total	197.893	149			
Long working hours	Between Groups	2.315	2	1.158	.947	.030
	Within Groups	179.685	147	1.222		
	Total	182.000	149			

From table 5.2.4, it is inferred that there was a significant difference in routine work and long working hours among the different age groups of the respondents.

5.2.5ANOVA test of employment type and psychological problems

TABLE 5.2.5 ANOVA TEST OF EMPLOYMENT TYPE AND PSYCHOLOGICAL PROBLEMS

		Sum of Squares	df	Mean Square	F	Sig.
Stress	Between Groups	.261	1	.261	.255	.615
	Within Groups	151.932	148	1.027		
	Total	152.193	149			
Depression	Between Groups	.021	1	.021	.016	.901
	Within Groups	196.219	148	1.326		
	Total	196.240	149			
Routine work	Between Groups	1.661	1	1.661	.922	.339
	Within Groups	266.579	148	1.801		
	Total	268.240	149			

Heavy work load	Between Groups	5.322	1	5.322	4.090	.045
	Within Groups	192.572	148	1.301		
	Total	197.893	149			
Long working hours	Between Groups	.963	1	.963	.787	.036
	Within Groups	181.037	148	1.223		
	Total	182.000	149			

From table 5.2.5, it is inferred that there was a significant difference in heavy work load and long working hours among the different employment types of the respondents.

5.2.6 ANOVA test of employment type and health problems

TABLE 5.2.6 ANOVA TEST OF EMPLOYMENT TYPE AND HEALTH PROBLEMS

		Sum of Squares	df	Mean Square	F	Sig.
Hearing loss	Between Groups	.002	1	.002	.001	.972
	Within Groups	198.772	148	1.343		
	Total	198.773	149			
Asthma	Between Groups	.672	1	.672	.508	.477
	Within Groups	195.701	148	1.322		
	Total	196.373	149			
Lung Diseases	Between Groups	.095	1	.095	.115	.736
	Within Groups	122.145	148	.825		
	Total	122.240	149			
Skin Rashes	Between Groups	.727	1	.727	.576	.449
	Within Groups	186.846	148	1.262		
	Total	187.573	149			
Cancer	Between Groups	.002	1	.002	.002	.968
	Within Groups	168.458	148	1.138		
	Total	168.460	149			
Restless Feel	Between Groups	3.331	1	3.331	3.073	.042
	Within Groups	160.429	148	1.084		
	Total	163.760	149			
Head ache	Between Groups	.182	1	.182	.178	.674
	Within Groups	151.212	148	1.022		
	Total	151.393	149			

From table 5.2.6, it is inferred that there was a significant difference in restless feel among the different employment types of the respondents.

5.2.7 ANOVA test of adoption of modern machineries and health problems

TABLE 5.2.7 ANOVA TEST OF ADOPTION OF MODERN MACHINERIES AND HEALTH PROBLEMS

		Sum of Squares	df	Mean Square	F	Sig.
Hearing loss	Between Groups	3.478	4	.870	.646	.031
	Within Groups	195.295	145	1.347		
	Total	198.773	149			
Asthma	Between Groups	16.829	4	4.207	3.398	.011
	Within Groups	179.544	145	1.238		
	Total	196.373	149			
Lung Diseases	Between Groups	12.762	4	3.190	4.226	.003
	Within Groups	109.478	145	.755		
	Total	122.240	149			
Skin Rashes	Between Groups	7.414	4	1.853	1.492	.208
	Within Groups	180.160	145	1.242		
	Total	187.573	149			
Cancer	Between Groups	1.485	4	.371	.322	.863
	Within Groups	166.975	145	1.152		
	Total	168.460	149			
Restless Feel	Between Groups	1.261	4	.315	.281	.890
	Within Groups	162.499	145	1.121		
	Total	163.760	149			
Head ache	Between Groups	9.465	4	2.366	2.417	.051
	Within Groups	141.928	145	.979		
	Total	151.393	149			

From table 5.2.7, it is inferred that there was a significant difference in hearing loss, asthma, lung diseases and head ache with adoption of modern machineries

5.2.8 ANOVA test of adoption of modern machineries and musculoskeletal problems

TABLE 5.2.8 ANOVA TEST OF ADOPTION OF MODERN MACHINERIES AND MUSCULOSKELETAL PROBLEMS

		Sum of Squares	df	Mean Square	F	Sig.
Lower back pain	Between Groups	7.594	4	1.898	1.580	.018
	Within Groups	174.199	145	1.201		
	Total	181.793	149			
Neck pain	Between Groups	12.473	4	3.118	2.498	.045
	Within Groups	181.020	145	1.248		
	Total	193.493	149			
Knee pain	Between Groups	4.155	4	1.039	.799	.527
	Within Groups	188.438	145	1.300		

	Total	192.593	149			
Shoulder pain	Between Groups	8.702	4	2.176	1.813	.129
	Within Groups	173.991	145	1.200		
	Total	182.693	149			
Hand pain	Between Groups	8.988	4	2.247	1.805	.013
	Within Groups	180.512	145	1.245		
	Total	189.500	149			

From table 5.2.8, it is inferred that there was a significant difference in lower back pain, neck pain and hand pain with adoption of modern machineries

5.2.9 ANOVA test of adoption of modern machineries and psychological problems

TABLE 5.2.9 ANOVA TEST OF ADOPTION OF MODERN MACHINERIES AND PSYCHOLOGICAL PROBLEMS

		Sum of Squares	df	Mean Square	F	Sig.
Stress	Between Groups	5.487	4	1.372	1.356	.025
	Within Groups	146.707	145	1.012		
	Total	152.193	149			
Depression	Between Groups	2.016	4	.504	.376	.825
	Within Groups	194.224	145	1.339		
	Total	196.240	149			
Routine work	Between Groups	6.945	4	1.736	.964	.043
	Within Groups	261.295	145	1.802		
	Total	268.240	149			
Heavy work load	Between Groups	5.348	4	1.337	1.007	.040
	Within Groups	192.546	145	1.328		
	Total	197.893	149			
Long working hours	Between Groups	5.246	4	1.312	1.076	.371
	Within Groups	176.754	145	1.219		
	Total	182.000	149			

From table 5.2.9, it is inferred that there was a significant difference in stress, routine work, and heavy work load with adoption of modern machineries

5.3 CHI-SQUARE

Chi-square test is performed between health problems, musculoskeletal problems and psychological problems among employees of varied experience levels.

5.3.1 CHI-SQUARE ON EXPERIENCE AND HEALTH PROBLEMS

H_{10}: There is no significant relationship between the experience and health problems.

TABLE 5.3.1 CHI-SQUARE ON EXPERIENCE AND HEALTH PROBLEMS

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	42.386[a]	51	.799
Likelihood Ratio	49.620	51	.529
Linear-by-Linear Association	1.001	1	.317
N of Valid Cases	150		
a. 70 cells (97.2%) have expected count less than 5. The minimum expected count is .21			

From table 5.3.1, the P value is greater than 0.05. So the null hypothesis is accepted. There is no significant relationship between the experience and health problems.

5.3.2 Chi-square on experience and musculoskeletal problems

H_{20}: There is no significant relationship between experience and musculoskeletal problems.

TABLE 5.3.2 CHI-SQUARE ON EXPERIENCE AND MUSCULOSKELETAL PROBLEMS

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	50.824[a]	42	.165
Likelihood Ratio	57.995	42	.051
Linear-by-Linear Association	1.830	1	.176
N of Valid Cases	150		
a. 55 cells (91.7%) have expected count less than 5. The minimum expected count is .21			

From table 5.3.2, the P value is greater than 0.05. So the null hypothesis is accepted. There is no significant relationship between experience and musculoskeletal problems.

5.3.3 Chi-square on experience and psychological factors

H_{30}: There is no significant relationship between the experience and psychological factors.

TABLE 5.3.3 CHI-SQUARE ON EXPERIENCE AND PSYCHOLOGICAL FACTORS

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	57.809[a]	39	.027
Likelihood Ratio	61.607	39	.012
Linear-by-Linear Association	.673	1	.412
N of Valid Cases	150		
a. 50 cells (89.3%) have expected count less than 5. The minimum expected count is .21			

From table 5.3.3, the P value is less than 0.05. So the null hypothesis is rejected. There is a significant relationship between the experience and psychological factors.

6. RESULTS AND DISCUSSION

The results of percentage analysis show that married employees are more compared to unmarried employees in the textile industries of these districts. As other district, in this district also female employees are employed higher than male employees. The mid age group of 23-27 years are seen

more and most of them are educated at school level. Temporary employees are engaged in higher number and more number of employees belongs to spinning section. The employees are highly satisfied on training provided on the usage of modern machineries and safety mechanism. The management provides adequate facilities on first aid, alarm during emergency, and separate storage space for chemicals used.

The experience employees feel the significant difference in their lower back pain and knee pain; had a significant difference in neck pain among the different gender groups; had a significant difference in lower back pain and knee pain among the different age groups; had a significant difference in routine work and long working hours among the different age groups; had a significant difference in heavy work load, long working, restless feel hours among the different employment types; after adoption of modern machineries, The employees had a significant difference in hearing loss, asthma, lung diseases and head ache; lower back pain, neck pain and hand pain; stress, routine work and heavy work load. There is no significant relationship between the experience and health problems; experience and musculoskeletal problems and had a significant relationship between the experience and psychological factors

7. CONCLUSION

The study reveals that; most of the employees are feeling happy after adoption of modern machineries in their industry. After adequate training, they are allowed to operate the machineries. Safety measures were insisted by the management now and then. After ensuring the necessary safety equipments employees are allowed to their respective sections. The study reveals that employees in textile industries are facing health issues like musculoskeletal problems and psychological problems. The employees need to ensure their safety at work place which had significant relationship with their health. The management realizes the impact of health and safety of employees in all aspects, so they are ensuring the better facilities for their workers.

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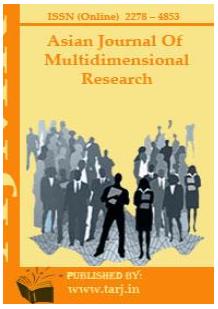

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INFLUENCE OF ORGANIZATIONAL POLITICS ON ORGANIZATIONAL COMMITMENT

Ms. M. Priyadharshini*

*Research Scholar,
PSGR Krishnammal College for Women,
Coimbatore, Tamil Nadu, INDIA

ABSTRACT

The Indian Banking industry sparked a boom to the country during the past two decades. Banking industry is the backbone for the Indian economy. Banking is the service industry that offers plenty of services and facilities to make human life at ease. In this global business environment, a healthy banking system is essential in order to achieve a stable economy. Banking industry has the challenge to meet the customer's expectations which is at rise. In the context of Fourth Industrial Revolution or Industry 4.0 where automation and digitization plays a major role in any organization, the employees have to enhance their skill sets and competencies to survive in the fast paced requirements of the organization. Added to this there will be increased role of organizational politics to embrace the change brought in by the Industry 4.0. With the changing climate of customer expectations, developments in the organization with the coming of Industry 4.0 and the increase in organizational politics, the need of committed employees are foremost for any organization. Therefore the purpose of the study is to investigate the influence of Perception of Organizational Politics on Organizational Commitment. Data was collected from 1262 employees of the public and private sector banks in South India through a validated questionnaire. Data was analyzed using SPSS and WarpPLS. The result reveals that Perception of Organizational Politics is positively correlated with Organizational Commitment.

KEYWORDS: *Organizational Politics, Organizational Commitment*

INTRODUCTION

The fourth Industrial Revolution is expected to bring about major changes in the banking industry; hence banks need to evolve strategies to compete among their competitors and to gain sustainable competitive advantage. There would be manifold increase in the expectations of the customers with more automation and digitization. To meet the requirements of the organization and the expectations of the customers, the employees need multiple skill set and competencies. They need sufficient

training to face the demand created by Industry 4.0. In this context there is increasing demand from the employees to develop themselves and deliver the requirements of the organization and meet the expectations of the customers. Hislop, (2003) argues that there is a rapid change in the employment relationships that seeks the importance of understanding of Commitment in organization. Commitment is a dynamic phenomenon that grows and declines in reaction to positive and negative experiences of an employee on the job (Kammeyer-Mueller et al., 2005; Klein et al., 2012; Solinger et al., 2015). Earlier day's employees join in an organization and work until retirement (Balaji, 1986), but nowadays there are alternative options for employees. Amidst these conditions employees perceive certain degree of politics in an organization. Organizational Politics is an unapproved behavior of an employee, which is also needed to a threshold level. On the other hand, organization should understand and take necessary action to make employees be committed to their organization. Committed employees will go the extra mile to achieve organizational success. In this competitive environment, banking industry offers various services to retain their customers. Hence to improve the organizational productivity and differentiate themselves with their competitors, they need employees who are committed to their organization. Hence this research attempts to investigate the influence of Perception of Organizational Politics (OP) on Organizational Commitment (OC).

LITERATURE REVIEW

This section presents the review of existing research on Organizational Commitment and Organizational Politics, followed by theoretical framework and objectives of the study.

Organizational Commitment is the nature of the relationship between the individual and an organization. Allen and Meyer (1990) defined Organizational Commitment as "the emotional attachment to, identification with, and involvement in, the organization". The various definitions by Mowday et al., (1979, p.226),Ahmad and Oranye (2010), Ajibade and Ayinla (2014) of Organizational Commitment share a common theme which identifies that Organizational Commitment leads to link the individual with the organization. Allen and Meyer (1990) developed a three-component model of Organizational Commitment. They are Affective Commitment, Continuance Commitment, and Normative Commitment. Affective Commitment is defined as the employee's positive emotional attachment to the organization. Continuance Commitment refers to "Commitment based on the cost that employees associate with leaving the organization". Normative Commitment refers to "employee's feelings of obligation to remain with the organization". In this competitive environment, employee's Commitment is very much essential to achieve organization goals. Van Gelderen& Bik, (2016) stated that the employees attached to the organization are more interested to help their colleagues. Committed employees will overcome obstacles easily, are more innovative which in turn leads to high production.

Politics refers to influencing people's reactions and behavior in work environment. It is a natural part of organizational life because it occurs on an ongoing basis, which is often invisible to all others except those who are directly involved. Organizational Politics refers to informal ways people try to influence others in the organization. Many studies have shown the same kind of Politics in the organization. A common feature reflected in a number of definitions of Organizational Politics is Self-Serving Behavior (e.g., Burns, 1961; Mayes & Allen, 1977; Poon, 2004; Drory and Vigoda-Gadot, 2010; Gotsis and Kortezi, 2011; Danish et al., 2014). Today's organization scenario is that employees need skills in handling various conflicts that occurs in work place. Some amount of Organizational Politics is needed that will foster healthy climate in an organization.

THEORITICAL FRAMEWORK

There are plenty of research studies which highlight the relationship between Organizational Politics and Organizational Commitment. Study by Ismail and Arshad (2016) showed that Organizational Politics and Organizational Commitment are negatively related. The associations between Perceived Organizational Politics and Self-monitoring are positively related to Organizational Commitment. Vigoda-Gadot (2010) reported that Perceptions of Organizational Politics is negatively related with Job Satisfaction and Organizational Commitment, and positively related with job stress and job burnout. Trust in fellow workers and social support and reciprocity (i.e., Social Capital) is partially related to Job Performance and Organizational Politics. Further he also found that employees with high social capital will react positively to Organizational Politics comparing to low in social capital. Social capital moderates the relationship between Perceived Organizational Politics and Job Performance. Since Organizational Politics is a negative process for an organization, employees with strong commitment will not act politically; instead they will be against those political behaviors, since they are more committed and wish to protect their organization and the bond with their colleagues. Saxena and Puri (2015) in their study initially proposed that Organizational Commitment and Organizational Politics will be significantly correlated, whereas the results obtained show significant negative relation between Organizational Commitment and Organizational Politics. Further males and females have significant difference in Commitment, strong difference in politics especially if it is in the area of non-compliance-compliance; disloyalty-loyalty; and self-centered-organization centered and Organizational Politics in total.

There are also some studies which suggest that there is significant relation between Organizational Commitment and Organizational Politics. Wilson (1995) investigated and discovered that power and politics have significant effect on Organizational Commitment among executives. Studies by Drory (1993); Ferris et al., (1989, p.158); Gotsis and Kortezi (2010, p. 499); Vigoda-Gadot and Kapun (2005, p. 258) supported that perceived Organizational Politics will have a negative effect on Organizational Commitment among employees at lower level. Yilmaz et al., (2014) in his study used three dimensions of Organizational Politics namely General Political Behavior, Going Along to Get Ahead and Pay and Promotion. Results reveal that Organizational Commitment has negative effect on General Political Behavior and Going Along to Get Ahead in public organization. Managers' perception of Organizational Politics positively affects their propensity to create budgetary slack. Considering the above discussions the following hypothesis H_1 is proposed.

H_1: "Perceived Organizational Politics will be significantly related to Organizational Commitment"

OBJECTIVE OF THE STUDY

1. To study the perception of Organizational Politics and Organizational Commitment among the employees.
2. To investigate the influence of Organizational Politics on Organizational Commitment.

METHODOLOGY

The study is descriptive in nature and adopted survey strategy. A questionnaire survey method was used to seek responses from Public and Private sector banks in the South Indian States namely Kerala, Tamil Nadu, Karnataka, Andhra Pradesh and Telangana. The city that has the maximum number of banks was identified from RBI website and from that city using systematic random sampling banks was chosen and from each bank 50% of the employees were included for the study. The sample size for the study is 1262 respondents. The data were collected between the months of

August- December 2017. The questionnaire had two parts; part 1 includes the demographic profile of the respondents and part 2 the study variables. The study variables were measured using a three-point Likert scale, ranging from 3 - Agree, 2 - No Opinion and 1- Disagree. A pilot study was conducted with responses collected from 81 respondents and results reveal that the instrument used for the study is reliable, since the constructs had an Cornbach Alpha Value above 0.7 (Nunnally, 1978).

TABLE 1 MEASURES USED FOR THE STUDY

Construct	Author	Number of Items	Cronbach Alpha
Organizational Politics (OP)	Kacmar and Ferris (1991)	12	0.712
Organizational Commitment (OC)	Allen and Mayer (1990)	18	0.805

ANALYSIS AND DISCUSSION

This section presents the analysis of the data that was carried out. The tools used for analysis are SPSS and Warp PLS. Demographic profile of the respondents and the perception of the respondents with regard to the study variables are presented. Further, the study examines the association between Organizational Politics and Organizational Commitment, regression analysis is performed to elicit the influence of dependent variable Organizational Commitment with the items of independent variable Organizational Politics. The hypothesis is tested using Warp PLS.

To map the demographic profile of the respondents' descriptive statistics is presented with frequency and percentage. The demographic factors included in the study are age, gender, sector and Designation. This gives an overview of the background and characteristics of the respondents. Table 2 represents the demographic profile of the respondents.

TABLE 2 DEMOGRAPHIC PROFILE OF THE RESPONDENTS

Demographic profile	Description	Frequency	Percent
Age (Years)	Below 25	288	22.8
	26-35	715	56.7
	36-45	165	13.1
	Above 45	94	7.4
Gender	Male	645	51.1
	Female	617	48.9
Sector	Public	596	47.2
	Private	666	52.8
Designation	Manager	370	29.3
	Senior Manager	189	15.0
	Assistant Manager	548	43.4
	Front Office Staff	155	12.3

Source: Primary data

From the table 2 it is inferred that majority (56.7%) of the respondents are in the age group between 26-35 years. Only 7.4% are above 45 years. The reason is employees in this age group are either in higher designation and are not interested to take up the survey or less in number at lower designation

because they take voluntary retirement and take up a second career. 51.1% of the respondents are male and 48.9% of the respondents are female, indicating almost an equal representation of both the gender. Banking being a service oriented industry where considerable importance is attached to customer service and dealing with clients, hence the banking industry has appreciated the need for female employees in the recent times. Further the banks have made the working environment more suitable for female candidates with good stability and security in the job. They are also provided with adequate compensation on par with male counterparts. All the above factors together have played a role in bringing more female employees almost equal in number with the male employees.Majority (52.8%) of the respondents are from private sector banks and 47.2 % from public sector banks.Majority (43.4%) of the respondents are Assistant manager. In recent times, more branches are opened in the rural areas with limited and diversified services, and each branch is headed with assistant managers. Further the banks nowadays have diversified their business from their normal banking into insurance, merchant banking, corporate banking etc., and each division is headed by an Assistant Manager, and hence their numbers are more. Moreover 15% of the respondents are in the cadre of Senior Manager.

Next Descriptive statistics is performed to identify the respondent's level of opinion regarding the study variables.

TABLE 3 DESCRIPTIVE STATISTICS

Constructs	Dimension	Mean	Standard Deviation
Organizational Politics		**1.9762**	**.35798**
Organizational Commitment	Affective Commitment	2.1253	.39423
	Continuance Commitment	2.1557	.48896
	Normative Commitment	2.2603	.48795
Organizational Commitment		**2.1804**	**.35853**

Source: Primary data

Table 3 presents the mean values for the study variables. The mean and standard deviation of the responses given by the employees working in Public and Private sector banks in 5 states of South India and all the 1262 respondents are portrayed.

It is inferred from the table 3 that between the 2 factors the highest mean value is for the factor Organizational Commitment (M=2.1804, SD=0.35853) and the lowest mean value is for Organizational Politics (M=1.9762, SD=0.35798). Comparing the responses given by the bank employees, it reveals that the respondents perceive both the variables important.

The organizational commitment among the banking employees is important because employees feel they should stay at their organization where they easily identifying the organizations goal and fit into it and act accordingly. Also they are bound with the organization emotionally and intellectually. The mean value of Normative Commitment has a higher value than Affective Commitment and Continuance Commitment. Employees who are involved in politics exhibit their self-serving behavior without considering the betterment of organization. Such a political behavior is likely to affect their performance. Sometimes, the behaviors of individuals are not considered as political, when Organizational Politics in that particular situation is used in a way for the benefit of the organization. Employees in banking industry,who are able to understand the work environment and control the feelings, are less affected by Organizational Politics. The banking industry being a structured organization, there exist only moderate politics but it can increase under conditions of

scarce resources, uncertainty, ambiguity, and the need for change. In addition a few employees consider the organizational interest more than their self-interests and there are also instances where employees with vested self-interest engage in politics, suppressing the organizations interests for their self-interest.

To examine the second objective, that is, to investigate the influence of the factors influencing Organizational Politics on Organizational Commitment, Correlation analysis is performed initially to find the association between Organizational Commitment and Organizational Politics; further stepwise regression analysis is performed to examine the extent of influence of the factors influencing Organizational Politics on Organizational Commitment. The individual items of Organizational Politics are taken as independent variables and Organizational Commitment as dependent variable. Robust path analysis is performed using Warp PLS to test the Influence of Organizational Politics on Organizational Commitment.

TABLE 4 ASSOCIATION BETWEEN ORGANIZATIONAL POLITICS AND ORGANIZATIONAL COMMITMENT

		Organizational Commitment
Organizational Politics	Pearson Correlation	0.066*
	Sig. (2-tailed)	0.019
* Correlation is significant at the 0.05 level (2-tailed).		

Source: Primary data

Table 4 presents the results of correlation analysis. The result shows that low correlation exists between Organizational Politics and Organizational Commitment (r=0.066, p=0.019), but the correlation is significant. This implies that employees place more value on Organizational Commitment when it comes to Organizational Politics. The employees in banking sector are committed when politics is perceived at workplace. There could be two reasons for politics; insecurity in job and other is to attain a better position. These two are the reasons that lead to involvement in politics where employees try to pull others down to grow. Hence employees to prove their presence and to exhibit their performance engage in activities, which over a period of time enhances their commitment to the organization.

Employees in banking sector are committed due to the brand name they are associated and they feel proud to be associated with that brand. Hence the employees in their job are more committed to that organization. Further the employees have a target and are rewarded for accomplishing their targets, and also are provided with monetary and non-monetary benefits, which are also the reasons for being committed to their job.

TABLE 5REGRESSION ANALYSIS - ORGANIZATIONAL POLITICS AS INDEPENDENT VARIABLE AND ORGANIZATIONAL COMMITMENT AS DEPENDENT VARIABLE - COEFFICIENTS

Items	**Unstandardized Coefficients**		**Standardized Beta Coefficients**	**t**	**Sig.**
	B	**Std. Error**			
(Constant)	2.144	.048		44.242	.000
OP1	.073	.015	.144	4.899	.000
OP8	-.095	.014	-.193	-6.732	.000

OP11	-.094	.012	-.190	-7.719	.000
OP3	.034	.015	.070	2.354	.019
OP10	-.074	.014	-.139	-5.474	.000
OP12	.051	.013	.102	4.062	.000
OP2	.058	.015	.116	3.943	.000
OP5	.042	.013	.091	3.307	.001
OP7	-.034	.014	-.069	-2.454	.014
F=70.661; p<0.000; AR^2=0.332					

Source: Primary data

Stepwise regression analysis was carried out by considering Organizational Commitment as dependent variable and items of Organizational Politics as independent variables. From table 5, it could be inferred that in, F-Test was statistically significant (F=70.661, p<0.000), which indicates that the model is statistically significant. The adjusted R square value of 0.332 indicates that 33.2 % of the variability in Organizational Commitment is predicted by 9 items of Organizational Politics. Among the 12 items of Organizational Politics, 9 items has been included in the model. The model reveals that among the 9 items of independent variable, item 1 "There is a group of people in this department who always get things their way because no one wants to challenge them" (β=0.144 positive, t=4.899 positive, p<0.000) has a highest positive influence on dependent variable, item 2 "There has always been an influential group in this department that no one ever crosses" (β=0.116 positive, t=3.943 positive, p<0.000), item 12 "When it comes to pay raise and promotion decisions, policies are irrelevant" (β=0.102 positive, t=4.062 positive, p <0.000), item 5 "Favoritism rather than merit determines who gets ahead around here" (β=0.091 positive, t=3.307 positive, p<0.000), and item 3 "I have seen changes made in policies here that only serve the purposes of a few individuals, not the work unit or the organization" (β=0.070 positive, t=2.354 positive, p<0.000) has a positive influence of 0.070 on dependent variable Organizational Commitment.

Item 8 "Rewards come only to those who work hard in this organization" (β=-0.193 negative, t=-6.732 negative, p<0.000) has the highest negative influence on dependent variable Organizational Commitment, item 11 "In our organization, pay and promotion policies are not politically applied" (β=-0.190 negative, t=-7.716 negative, p<0.000), item 10 "There is no place for yes-men around here; good ideas are desired even when it means disagreeing with superiors" (β=-0.139 negative, t=-5.474 negative, p <0.000), and item 7 "Promotions in this department generally go to top performers" (β=-0.069 negative, t=-2.454 negative, p <0.000) has a negative influence of 0.069 on dependent variable Organizational Commitment.

Employees are committed to their organization and they get things done by others. Hard working employees are benefited through rewards, pay and promotion policies which in turn enhances their commitment to their organization. Though policies are perceived only a few favors it and others don't interfere with them, which has also contributed in enhancing their commitment. Acceptance of good ideas, decisions and personal satisfaction of an employee also leads to Organizational Commitment.

Regression analysis reveals that in banking industry, Organizational Commitment is the one that pushes the employees to work not just for their self-improvement but makes them emotionally attached to their organization and drives them to work for the vision of their organization. Not all the employees in banks who are engaged to their work are committed to their organization because

Organizational Commitment is being decided upon various things such as non-favoritism, transparency in all the organizational decisions, freedom to open up without accounting into the ranking of authorities/senior officials, influence in decision making despite the cadres, etc.,. Employees benefited by politics are more excited which in turn increase their commitment towards their organization.

Warp PLS a SEM technique was used to find the influence of Organizational Politics on Organizational Commitment. Warp PLS produces path coefficients with their respective p-values, and R squared coefficients. In PLS-based SEM analysis, path coefficients are referred to as beta (β) coefficients. The R^2 value for the Dependent Variable Organizational Commitment is 8.9%. The explanatory power of the structural model is evaluated by examining the squared multiple correlation (R^2) value in the final dependent constructs. The R^2 measures the percentage of variation that is explained by the model.

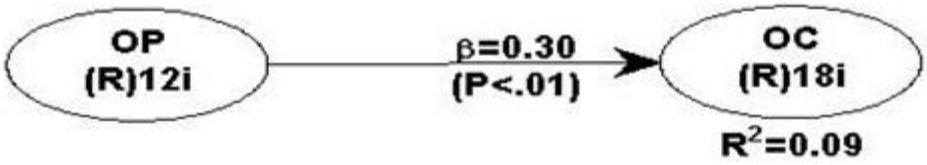

FIGURE 1: Structural Model - Influence of Organizational Politics on Organizational Commitment

TABLE 6 FIT INDICES

Indices	Average path coefficient (APC)	Average R-squared (ARS)	Average adjusted R-squared (AARS)	Average block VIF (AVIF)	Average full collinearity (AFVIF)	TenenhausGoF (GOF)	Sympson's paradox ratio (SPR)
OP→OC	0.299	0.089	0.089	NA	1.078	0.156	1.000

*Significant at 0.001

The R^2 for the dependent variables Organizational Commitment is (8.9%). Table 6 shows that the fit indices. The APC value of Organizational Politics to Organizational Commitment is 0.299 and the ARS value for Organizational Politics to Organizational Commitment is 0.089 which is significant at 5%. The AVIF value is not applicable for the above model. The AFVIF value for Organizational Politics to Organizational Commitment is 1.078 (standard value<5). The GOF value for Organizational Politics to Organizational Commitment is 0.156 (standard values - small =>0.01; medium=>0.25; large=>0.36) therefore the value fits in small range. The SPR value is 1(standard value =>0.7). From the above discussions it could be inferred that the model fit indices are within the standard values thus indicating that the model fits the data.

TABLE 7 PATH COEFFICIENTS

Path	Beta Coefficient	P value	Standard errors for path coefficients	Effect sizes for path coefficient	Result
OP→OC	0.299	<0.001	0.028	0.089	Hypothesis 1 Accepted

The path coefficients and the associated significance value, standard errors path coefficients and Effect sizes for path coefficients are presented in table 7. The path coefficients are measured from -1 to +1. The path coefficient value that is moving towards +1 exhibits a stronger positive correlation and the value nearer to -1 exhibit stronger negative association.

The path coefficient between Organizational Politics and Organizational Commitment is found to be 0.299, which indicates a positive relationship (β=0.299; $p < 0.001$), which is significant thus proving hypothesis 1. Therefore, it could be inferred that Organizational Politics has a positive significant impact on Organizational Commitment. Increase in Perception of Organizational Politics is likely to increase the Organizational Commitment of the employees. Results of the study are contradicting the results of earlier studies (Ismail and Arshad, 2016; Yilmaz et al., 2014).

This scenario could be compared to the scenario of examining the influence of stress on the performance of employees. Moderate amount of stress is likely to improve the performance of employees but in a long run it is likely to pull down their performance (Jamal, 1984: Akgun&Ciarrochi, 2003).

CONCLUSION

The present study focused on investigating the influence of Organizational Politics on Organizational Commitment in Banking Industry among the South Indian States. From the descriptive statistics, it could be inferred that banking employees bound with the organization emotionally and intellectually. A few employees are considering self-interest more and indulge in politics under the condition of scarce resources, which is unavoidable, but care needs to be taken that it is not detrimental to the organization. From regression analysis, it could be found that out of 12 items of OP, 9 items were included in the model. Item 'There is a group of people in this department who always get things their way because no one wants to challenge them' of Organizational Politics has the highest influence. Therefore, regression analysis reveals that banking employees are engage in politics where they accomplish their goal by making their peers/subordinates accept their decision by that means those employees are committed to their organization.

Results of SEM reveal that Organizational Politics has a positive and significant influence on Organizational Commitment. Hence in an organization, politics should be at a threshold level which is likely to enhance the commitment levels of employees. As said earlier, to sustain in the Fourth Industrial Revolution organizations require committed employees who will be able to provide better service to their customers, which in turn helps them to combat their competitors and also themselves to reach high. Also to take up the pressure to perform better, employees should be ready to embrace changes posed by Industry 4.0.Organizations can provide training programs to their employees focusing on embracing change brought about by Industry 4.0. These training programs would help employees prepare themselves to face the challenges posed by Industry 4.0 and also help them learn to manage politics at the work place.

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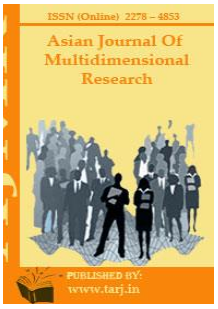

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MOBILE TECHNOLOGIES

Dr. R.K. Sudhamathi*; Ms. V. Rajalakshmi**

*Associate Professor,
GRG School of Management Studies,
PSGR Krishnammal College for Women,
Coimbatore, Tamil Nadu, INDIA

**Research Scholar,
Department of Management,
PSGR Krishnammal College for Women,
Coimbatore, Tamil Nadu, INDIA

ABSTRACT

In this competitive business world, all the industries need prominent strategies to earn a competitive advantage. Mobile Technology plays a vital role in providing business operations more effective and smooth, whether it's a small, medium or large-scale company, they need to promote their business so that users can easily get all required information about our offerings and us. There is no doubt that mobile apps are changing the relations between users and service providers. Industries are using mobile technologies in the form of application in their smart phones to promote their successful business. Mobile banking platform provides convenience and 24/7 access, builds a more meaningful relationship with their customers. They simplify banking services with improved security. Mobility has made learning convenient and affordable in the current age. E-learning is one of the most popular educational trends since past few years. From paying online bills to buying grocery products, everything is being ordered from mobile apps. Most of the people found this method too easy to place a food order online which save them huge time. Travelers are using mobile apps to plan their trips in a cost savvy way. Many useful features like weather forecast, map features, hotels, restaurants, shopping places can help a traveler. The mobile app provides up -to-date information about new collection of clothes, shoes, accessories, hand-bags, and more. Online shopping is getting famous day-by-day and people are using online shopping apps frequently to meet their daily shopping needs. Online shopping has an edge over traditional shopping as it is more convenient, offers a large variety, no crowds and makes discreet purchases easier. The innovative and interactive mobile business apps help retailers to show all the information related to their products with a 360 degree.

KEYWORDS: *Mobile technology, Mobile banking, E-learning*

1.INTRODUCTION

Mobile technology is the technology used for cellular communication. Mobile code-division multiple access (CDMA) technology has evolved rapidly over the past few years. Since the start of this millennium, a standard mobile device has gone from being no more than a simple two-way pager to being a mobile phone, GPS navigation device, an embedded web browser and instant messaging client, and a handheld gaming console. Many experts believe that the future of computer technology rests in mobile computing with wireless networking. Mobile computing by way of tablet computers are becoming more popular. Tablets are available on the 3G and 4G networks.

1G

1G refers to the first generation of wireless telephone technology (mobile telecommunications). These are the analog telecommunications standards that were introduced in 1979 and the early to mid-1980s and continued until being replaced by 2G digital telecommunications. The main difference between the two mobile telephone systems (1G and 2G), is that the radio signals used by 1G network are analog, while 2G networks are digital.

2G

2G (or 2-G) provides three primary benefits over their predecessors: phone conversations are digitally encrypted; 2G systems are significantly more efficient on the spectrum allowing for far greater mobile phone penetration levels; and 2G introduced data services for mobile, starting with SMS (Short Message Service) plain text-based messages. 2G technologies enable the various mobile phone networks to provide the services such as text messages, picture messages and MMS (Multimedia Message Service).

3G

3G technology provides an information transfer rate of at least 200 k bit/s. Later 3G releases, often denoted 3.5G and 3.75G, also provide mobile broadband access of several M bit/s to smart phones and mobile modems in laptop computers. This ensures it can be applied to wireless voice telephony, mobile Internet access, fixed wireless Internet access, video calls and mobile TV technologies.

4G

4G provides, in addition to the usual voice and other services of 3G, mobile broadband Internet access, for example to laptops with wireless modems, to smart phones, and to other mobile devices. Potential and current applications include amended mobile web access, IP telephony, gaming services, high-definition mobile TV, video conferencing, 3D television, and cloud computing.

5G

5G is a generation currently under development. It denotes the next major phase of mobile telecommunications standards beyond the current 4G/IMT-Advanced standards.

2. MOBILE TECHNOLOGY BENEFITS FOR INDUSTRIES

In this era of competitive business, all the industries need prominent strategies to earn a competitive advantage. Technology plays a vital role in providing industries with the much needed edge by making their complex business operations more effective and smooth. Mobile technology is the best possible medium to penetrate a new market.

Mobile Applications are the latest technological innovation which has revolutionized the business models as various industries are opting for this to acquire a maximum number of benefits. The mobile app market is growing faster.

Companies are looking to lift their brand name and revenue graph with effective use of a business mobile app. These industries are gaining benefits from a mobile app such as enhanced visibility, effective customer support, and easy communication. Most of the businesses have started developing a mobile app to boost their core business activities and increase sales.

A number of mobile app development companies in the market has boomed, businesses have a lot of options to choose the best suited app for their business requirements. Application developers are using various mobile app development technologies such as JAVA, Objective C, Swift, Groovy, XML, and more to develop highly interactive business apps.

Irrespective of the size of the business whether it's a small, medium or large scale company, the company needs to promote their business so that users can easily get all required information about the company and their offerings. There is no doubt that mobile apps are changing the relations between users and service providers. Consumers are happy to find a convenient way to access all the information. Similarly, a service provider finds it equally useful to interact with its customers.

3. HOW MOBILE APPLICATIONS ARE ADDING VALUE TO VARIOUS INDUSTRIES

At present, there are a number of industries that are taking advantage from mobile application. Listed below are a few of the top industries that are hugely benefited by the use of mobile apps.

3.1. BANKING

Bigger screens and better browsers are driving millions of smart phone users to online banking. The banks report the first wave of mobile users have higher rates of customer satisfaction and are more likely to provide referrals than traditional customers. Online banking is recession proof because it adds convenience without asking people to spend money. In its latest innovation major banks can send text alerts after unusual transactions, allowing customers to instantly cancel their credit cards.

MOBILE BANKING APP

Mobile banking technology puts banks in the palms of customers' hands—no matter where they are. Mobile banking platform provides convenience and 24/7 access that builds a more meaningful relationship with their retail and commercial customers—all on their preferred mobile devices.

MOBILE BANKING AT YOUR FINGERTIPS

Mobile banking app gives bank access to a customizable, user-friendly suite of features. Mobile banking app is compatible with various devices, and simplifies banking for customers by allowing them to:

- Transfer funds between accounts in real time.
- Transfer money to friends or family instantly through P2P payments.
- Access bank statements.
- Deposit checks through their mobile device's camera.
- View all account and transaction histories.
- Manage accounts and set personal financial goals.
- Name debit and credit cards for easy identification and turn cards on or off if lost or stolen.

- Authenticate with improved security measures, such as Android Fingerprint and iPhone X Face ID biometrics.
- Track real-time card activity and set financial alerts

HOW MOBILE BANKING SERVICES BENEFIT BANK

Mobile banking app offers the most relevant, up-to-date mobile banking technology that benefits bank through:

- Enhanced customer loyalty and account retention.
- Improved market share, mobile adoption and transaction volume.
- Instant customer access via self-registration options.
- Security guidelines and standards performance.
- Increased customer social media engagement.
- Targeted and customizable marketing for products and services.

SOME OF THE LEADING MOBILE APPLICATION

1) TEZ

Tez was a mobile payments service by Google, targeted at users in India. It was rebranded to Google Pay on August 28, 2018. It provides online payment system based on Unified Payments Interface (UPI), developed by the National Payments Corporation of India. It can be used where UPI payments are accepted. Tez works on the vast majority of India's smart phones (with apps for both Android and iOS) with the Android app supporting English, Hindi, Telugu, Bengali, Gujarati, Kannada, Marathi, and Tamil with more languages coming soon.

2) PAYTM

Paytm is an Indian e-commerce payment system and digital wallet company, based out at NOIDA SEZ, India. Paytm is available in 10 Indian languages and offers online use-cases like mobile recharges, utility bill payments, travel, movies, and events bookings as well as in-store payments at grocery stores, fruits and vegetable shops, restaurants, parking, tolls, pharmacies and education institutions with the Paytm QR code. This QR code accepts payments directly into their bank account. The company also uses advertisements and paid promotional content to generate revenues.

3) PHONEPE

PhonePe is a financial technology company headquartered in Bangalore, India. It was founded in December 2015. It provides online payment system based on Unified Payments Interface (UPI), which is a new process in electronic funds transfer launched by National Payments Corporation of India (NPCI). It is licensed by the Reserve Bank of India for issuance and operation of a Semi Closed Prepaid Payment system.

4) BHIM

Bharat Interface for Money (BHIM) is a mobile app developed by National Payments Corporation of India (NPCI), based on the Unified Payment Interface (UPI). It was launched by Prime Minister Narendra Modi in New Delhi on 30 December 2016. It was intended to facilitate e-payments directly through banks as part of the 2016 Indian banknote demonetization and drive towards cashless transactions.

3.2. EDUCATION INDUSTRY

Mobility has made learning convenient and affordable in the current age. E-learning is one of the most popular educational trends since past few years. The Mobile app enhances the interest of learners in learning and understanding content quickly. Various universities, colleges, schools are using mobile apps to increase the quality of education. A higher degree of efficiency can be achieved with the help of mobile technology. Apps are helpful in improving the collaboration between the students and the teachers.

Students are allowed to access learning modules and notes from anywhere at any time. Video learning and other customized software of this are also getting popular. Mobility has certainly reduced the constraint of distance between education provider & learner. It is through technology that distances can be bridged and education can be brought to the student's doorstep. Educational apps are there to personalize education and increase the reach of learning irrespective of geographical boundaries. Apps are also helpful in managing the overall operation of the educational system.

Mobile apps, mobile technology, and the infrastructure to allow this learning to progress also spills over into related areas of education such as Infrastructure development, teacher training & development, technical support, content development, developing curriculum, academic administration, and more.

3.3. FOOD INDUSTRY

With the development of technology, people look over mobile app for every work to be done. From paying online bills to buying grocery products everything can be ordered from mobile apps. With huge number of young professionals in the big cities people can't find much time to prepare food, Food Delivery Apps make the job easy in India.

The app can be downloaded from play or App store, and one can register into the app. Upon selecting the menu and placing order the food is delivered at the doorstep. Most of the young IT professional and other office goers found this method too easy to place a food order online which save them huge time. Online food delivery website and mobile application are popular in Indian cities like Bangalore, Chennai, Hyderabad, Mumbai.

SOME OF THE MOBILE APPLICATION IN FOOD INDUSTRY

Described below are the most popular mobile apps for food delivery in India that are helping to serve tastier lives at home.

1) SWIGGY

Swiggy is one of the top rated food ordering mobile application in India. It was aroused by the prospect of giving entire sustenance requesting and conveyance arrangement from the best nearby hotels to the customers. Swiggy is best food delivery apps Bangalore and other top cities in India. With over 10,000,000+ downloads in the play store, Swiggy rated as No. 1 online food ordering app in India.

2) ZOMATO

Zomoto Order is an online food ordering service which is launched by popular restaurant finder Zomato, the food delivery service in India operating from all major cities. With huge popularity in a quick span of time, Zomato is the biggest rival for Swiggy in India. Zomato is an online restaurant

search platform available for Mobile devices discovered in 2008. Later the company expands the feature by including food order and delivery in top cities. Zomato is operating in nearly 25 countries across the world including India, Australia, United States. A user can place an order by selecting nearby restaurant and tapping over the menu.

3) UBER EATS

Uber Eats is a popular online food ordering app in India which operates in all major cities including Mumbai, Chennai, Bangalore, Hyderabad, Delhi and more. The mobile app is available for both android and iOS devices. This is a venture of Uber Technologies, Inc. who is also own popular taxi service across the globe. Uber Eats operating in over 1000+ many major cities around the world in various countries. The app allows users to pick favorite food from nearby restaurants and delivers to the spot in quick time. In a quick span of time, Uber became a tough competitor to other leaders like Swiggy and Zomoto.

5) DOMINO'S

Domino's is a prominent pizza delivery app which is available in Android and iOS platforms. The telephone call pizza ordering service now upgraded as a mobile app to place an order without calling. Domino's provides different coupons and offers for customers to choose the best availability to taste with continent payment options.

3.4. TRAVEL AND TOURISM INDUSTRY

Many tourism companies are using mobile app technology in order to enhance growth and brand image for their business. After understanding the key advantages of a mobile app, the travel industry is effectively using technology & enjoying its unmatched results.

Travelers are using mobile apps to plan their trips in a cost savvy way. Many useful features like weather forecast, map features, hotels, restaurants, shopping places can help a traveler. From finding a home stay to booking tickets, nowadays travel apps comprises all advanced features in order to serve customers quick. These apps help in finding the most affordable flight and hotel.

SOME OF THE MOBILE APPICATION IN TRAVEL AND TOURISM INDUSTRY

1) UBER

Active in about 84 countries and more than 800 cities, Uber is the global king of ridesharing apps. The app pioneered on-demand services, and it can be particularly handy when travelling abroad. A car can be quickly requested within the app after perusing an assortment of differing vehicle rates and fare quotes. After establishing connect with the driver, one can track the approaching car's location, and securely pay the fare using a credit card — no cash needed.

2) GOOGLE MAPS

Google Maps is widely regarded as the best navigation app around. It offers directions for travel by car, on public transit, on foot, by cab, or on bicycle. Maps can be used to find out when places like museums or restaurants close, and check to see how busy a place is in real time.

3) MOBILE PASSPORT

Mobile Passport lets you skip the regular line to enter the country and is officially authorized by U.S. Customs and Border Protection. Downloading this app and adding our passport information

scanning it with our phone's camera can skip long lines. Mobile Passport is accepted at 24 airports in the U.S.

4) GOOGLE TRIPS

Google's relatively new Trips app can pull reservations from email, adding hotel bookings, car rental details, and more. In doing so, it creates an underlying framework for the trip without an individual having to do much. Once it's set up, we can browse through the app to look at accurate day trips, as well as suggested and popular places to visit or eat at, and plan the whole day. Google Trips lets us store this data offline as well, to enable access the itinerary and important information at any time.

6) TRIP ADVISOR

Trip Advisor is a catch-all app when it comes to travel. Helps to quickly review millions of reviews, opinions, videos, and photos pertaining to just about anything related to the trip — restaurants, hotels, airlines, and more. Trip Advisor's Near Me function helps to find well-reviewed places close by, but the best feature the app has to offer is the number of countries it supports — it's just about everywhere, making it a necessary guide for every traveler.

3.5. ONLINE SHOPPING INDUSTRY

There are plenty of brands worldwide and regularly they are launching a new collection of clothes, shoes, accessories, hand-bags, and more. Many brands started providing their customers a mobile fashion application through which they can get up-to-date information about their latest product line. It can also help brands to send latest tips to their regular customers and can boost their sales.

With the innovation of augmented reality, online shopping is going into a new era. Due to the rapid growth of technology, business organizations have switched over from the traditional method of selling goods to the electronic method of selling goods. Business organizations use the internet as the main vehicle to conduct commercial transactions.

Online shopping is getting famous day-by-day and people are using online shopping apps frequently to meet their daily shopping needs. Online shopping has an edge over traditional shopping as it is more convenient, offers a large variety, no crowds and makes Discreet purchases are easier.

SOME OF THE MOBILE APPICATION IN ONLINE SHOPPING INDUSTRY

1) AMAZON

Amazon is a multinational technology company focusing in e-commerce, cloud computing, and artificial intelligence in Seattle, Washington. It is one of the Big Four or "Four Horsemen" of technology along with Google, Apple and Facebook due to its market capitalization, disruptive innovation, brand equity and hyper-competitive application process. Amazon is the largest Internet company by revenue in the world and the second largest employer in the United States.

2) FLIPKART

Flipkart is an Indian electronic commerce company based in Bangalore, India. Founded by Sachin Bansal and Binny Bansal in 2007, the company initially focused on book sales, before expanding into other product categories such as consumer electronics, fashion, and lifestyle products. Flipkart is significantly dominant in the sale of apparel (a position that was bolstered by its acquisitions of Myntra and Jabong.com), and was described as being "neck and neck" with Amazon in the sale of electronics and mobile phones. Flipkart also owns PhonePe, a mobile payments service based on the Unified Payments Interface (UPI).

3) SNAPDEAL

Snapdeal is an Indian e-commerce company based in New Delhi, India. The company was started by Kunal Bahl and Rohit Bansal in February 2010. As of 2014, Snapdeal had 3,00,000 sellers, over 3crore products across 800+ diverse categories from over 1,25,000 regional, national, and international brands and retailers and a reach of 6,000 towns and cities across the country.

4) OLX

The OLX marketplace is a platform for buying and selling services and goods such as electronics, fashion items, furniture, household goods, cars and bikes. In 2014, the platform had 11 billion page views, 200 million monthly active users, 25 million listings, and 8.5 million transactions per month.

3.6. RETAIL INDUSTRY

The retail industry is a huge sector with various complexities. Mobile app developers can build innovative and interactive mobile apps which can change the entire landscape of retail business to offer better customer service and operation. Business apps help retailers to show all the information related to their products with a 360 degree view. Mobile applications help retail industry to engage their customers more closing and build a community within their mobile app.

Retail mobile apps provide several unique features to give retailers opportunities to reach out target customers, promote products, create a brand image and ultimately increase sales. Retail business owners understand the importance of mobile applications for their business & they are including it into their business strategy for future growth.

SOME OF THE MOBILE APPICATION IN RETAIL INDUSTRY

1) FACEBOOK PAGE MANAGER

Creating a Facebook Page allows the more than 2 billion people on Facebook to discover the business – think of the Page as a digital shop front. Setting up a business Page is simple and free, and it looks great on both desktop and mobile. Business page can be created according to the customer groups and needs. The app is very versatile, and can be used for posting updates, reply to messages, view insights, etc.

2) WHATSAPP

WhatsApp, a free messaging platform, allows communication between one-on-one and group chats. It's similar to Facebook Messenger, but the upside is that employees don't need to be on Facebook to use it. The app can be downloaded, from contacts people can be added and group can be created to share information.

4.1. ADVANTAGES OF MOBILE TECHNOLOGY

Benefits of using mobile technology for business can manifest in:

- Higher efficiency and productivity of staff.
- The quality and flexibility of service we offer our customers.
- The ability to accept payments wirelessly.
- Increased ability to communicate in and out of the workplace.
- Greater access to modern apps and services.
- Improved networking capabilities.

4.2. DISADVANTAGES OF MOBILE TECHNOLOGY

Main disadvantages that come with the use of mobile technology in business include:

- Costs - new technologies and devices are often costly to purchase and require ongoing maintenance and upkeep.
- Workplace distractions - as the range of technologies and devices increases, so does the potential for them to disrupt productivity and workflow in the business.
- Additional training needs - staff may need instructions and training on how to use new technology.
- Increased IT security needs - portable devices are vulnerable to security risks, especially if they contain sensitive or critical business data.

5. CONCLUSION

Mobile applications have transformed the way employees do their jobs in various industries. Even slow adopters in manufacturing & public sector have joined the party. In all industries they are using mobile technology. Highly regulated financial firms love enterprise mobility. Retailers are following the trend and getting the best out of it. Even less funded educational institutes are putting their hands on mobile devices and apps. Travel and tourism industries also using mobile technologies to serve the customers as they can do best to them. Mobile app also has changed the customer attitude regarding the food industries, where the food is on doorstep of them and saves their time. Mobile apps have changed the way online shopping industry works and also mobile apps are the first choice technology for travel & entertainment industry.

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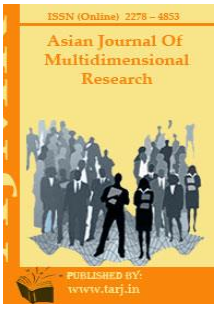

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CONCEPTUAL FRAMEWORK OF INDUSTRY 4.0 ITS ADOPTION AND ITS IMPACT ON HUMAN RESOURCE MANAGEMENT AND TALENT MANAGEMENT PRACTICES AT TATA CONSULTANCY SERVICES (TCS)

Dr. K. Nithya Kala*; Mrs. Azalena Colaco Rastogi**

*Assistant Professor,
BBA (Aided) Department,
PSGR Krishnammal College for Women,
Coimbatore, Tamil Nadu, INDIA

**PhD Research Scholar,
BBA (Aided) department,
PSGR Krishnammal College for Women,
Coimbatore, Tamil Nadu, INDIA

ABSTRACT

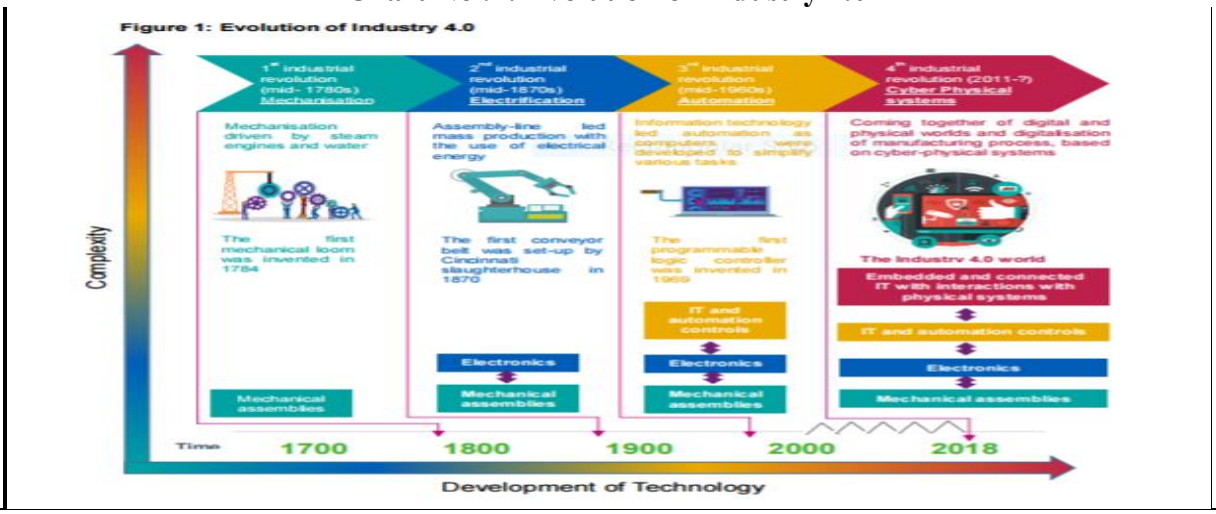
Globally, the Industry 4.0 market is expected to reach INR 13, 90,647 crores by 2023 (AIMA-KPMG-Industry-4.0-report, 2018). India is one of the fastest growing economies of the world and is ready to face global competition by undertaking the "Make in India" programme, by adopting industry 4.0 technology which includes the upcoming trends of Information and Communications Technology (ICT), Data Tools and Analytics, Cyber-Physical systems, Cloud Computing, Robotics and Automation, Artificial Intelligence, Internet of Things (IoT) and Process Digitisation across the business value chain thereby creating a "smart factory". The integration of digital technologies into the business environment, the so-called ***digitalisation****, has led to a number of changes in the practices of Human Resource Management (HRM) which include cloud-computing systems, social networking platforms, big data and HR analytics, mobile enabled technologies and coordinating work between machines and men. This paper addresses industry 4.0 its adoption and its impact on Human Resource Management and Talent management practices in select business organisations in India.*

KEYWORDS: *Industry 4.0, Digitalisation, HRM and Talent Management, Re-skilling*

INTRODUCTION:

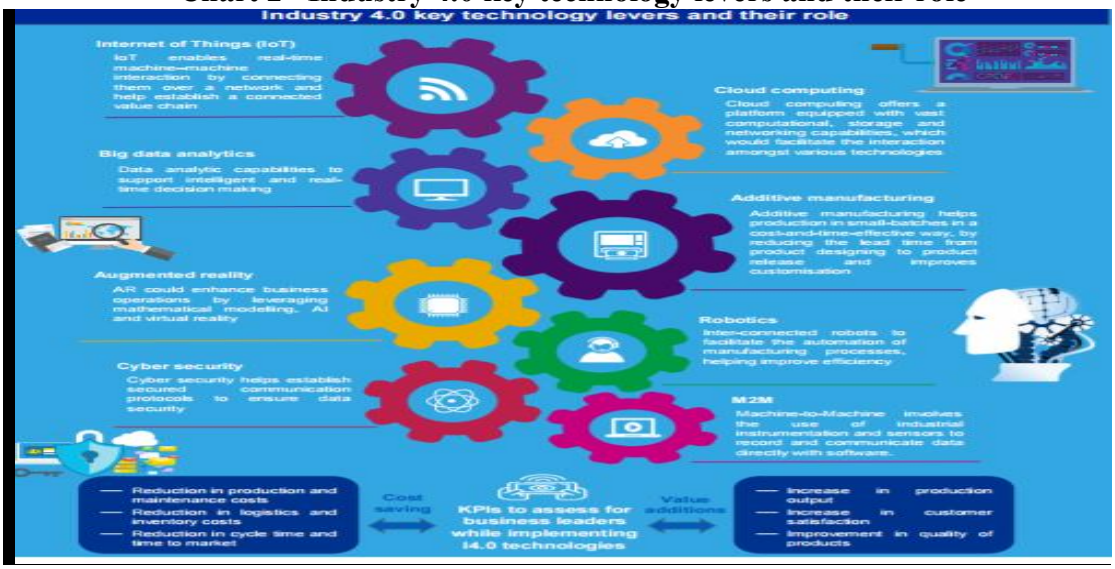
Industry 4.0 is a combination of advanced analytics, Big Data, Robotics & Automation, Artificial Intelligence, Internet of Things (IoT) and Process Digitisation across the business value chain.

Chart No .1: Evolution of Industry 4.0



Source: AIMA & KPMG Report (2018)

Chart 2 –Industry 4.0 key technology levers and their role



(Source: AIMA & KPMG Report (2018))

According to analysis done by McKinsey, if Indian companies adopt Industry 4.0 (I4.0) across functions like manufacturing, supply chain, logistics and procurement, they can increase their operating profits by 40% at less than 10% of the planned capital expenditure (Source: McKinsey Report 2018). The adoption of Industry 4.0 in India is still at a nascent stage. Some of the challenges faced are the need for high investment outlay, inadequate knowhow, lack of infrastructure, lack of adequate cyber security norms, leadership skill gap, workforce skill gap etc.

The core HRM tasks of every organization regardless of size or industry are to attract, recruit, develop, motivate, sustain performance and retain top global talent. If these tasks are not well executed it will have a negative impact on organizational performance. HR professionals are focusing on building workforce capabilities, investing in learning and development initiatives, cross function collaborations, boundary-less work etc.

OBJECTIVES OF THE STUDY

1. To understand the concept of Industry 4.0, the challenges and its adoption in India.

2. To study digitalisation and its effect on Human Resource Management.

3. To study the impact of Industry 4.0 on HRM and Talent Management practices in TCS.

RESEARCH METHODOLOGY

The study is descriptive in nature and the **secondary data** used in this paper is collected from industry reports, articles from the web (internet), expert blogs, research papers, magazines and news papers.

REVIEW OF LITERATURE:

Dadhich (2018) explained about how *artificial intelligence, machine learning, big data analytics and block chain have completely transformed the IT landscape, in* order to be future-ready, about 40 per cent of the IT/ITES and BPO workforce in India will need to re-skill themselves over the next five years.

The report of AIMA and KPMG (2018) on Industry 4.0 India Inc Gearing Up for Change, gives an insight into industry 4.0, how India is getting ready to adopt it, role of government as a facilitator, opportunities and risks to consider in I4.0 adoption ,up-skilling the workforce and re-engineering the talent pool for Industry 4.0.

Amla & Malhotra (2017) investigated the concept of digital transformation in HR and how new technologies like the use of Artificial Intelligence (AI), HR Chatbots, Machine Learning, Robot Process Automation (RPA) are assisting employees in the management of basic functions of human resource management like recruitment, screening, interviewing, on boarding to make it smarter, faster and more effective.

Karnik (2017) stated that TCS is quietly transforming itself to take on India's emerging technology scene. The paper also highlights how the primary goal of TCS is to make its employees digitally savvy, re-skilling at TCS, hiring and overhauling the interview process etc.

Irudayaraj (2017) explained about Industry 4.0, its adoption in India, Industry 4.0 talent scenario in India, gave various recommendations to create Industry 4.0 talent both from the Industry and Academic front and the technology / functional Skills relevant for Industry 4.0 for talent development in India.

CHALLENGES FACED BY INDIA IN THE ADOPTION OF INDUSTRY 4.0:

India is one of the fastest-growing economies of the world and it is a huge challenge to sustain that performance, provide jobs and ensure steadily rising incomes. India must chart its own path, especially at this time when digital innovations are rapidly transforming global industry as there is no global blueprint for success.

India can overcome these challenges by

1. Developing a solid foundation of strategic infrastructure: Companies need to work together with the government to create affordable and reliable sources of electricity, clean water, sanitation and healthcare.

2. Traditional manufacturing as well as digital technologies: India should adopt new digital industrial technologies to help India increase the efficiency of its traditional industries, while helping it to develop newer cutting-edge technologies.

3. Jobs: India's participation in the global markets, by producing goods that can be traded with the rest of the world, helps in the generation of high-paying jobs and also allows workers to learn valuable skills.

4. Human capital development: Training and development programmes are very essential for building local capability and ensuring a long-term vision for the country. India needs to strike the right balance between equipping its workforce with digital skills and traditional manufacturing skills. Private companies have a key role to play in this by creating highly skilled sustainable jobs, investing significantly in training and development, developing local supply chains.

ADOPTION IN INDIA

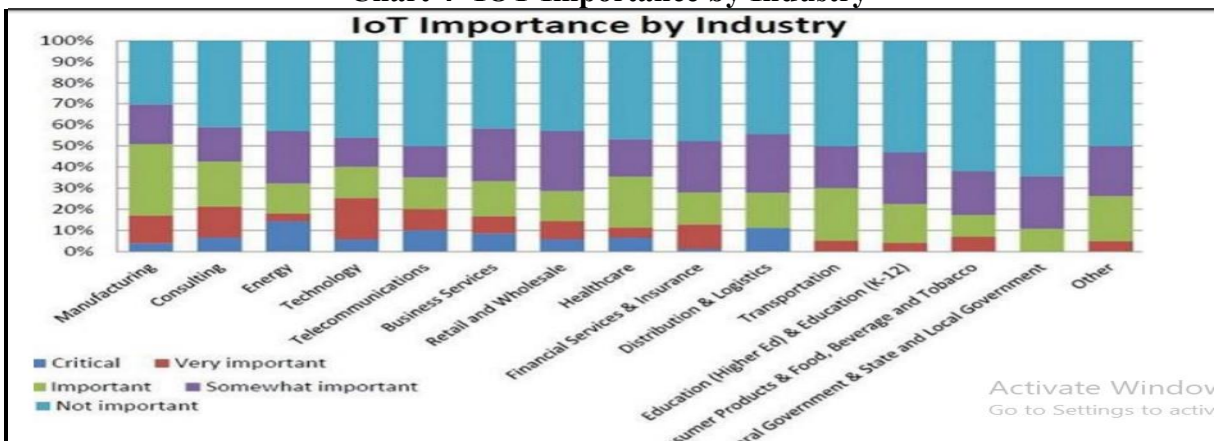
Globally, the I4.0 market is expected to reach INR 13, 90,647 crores by 2023. Many countries such as the U.S, China, and Japan and U.K, Ireland, Sweden and Austria have all started adopting I4.0 (Source: AIMA&KPMG report (2018).Industry 4.0, India Inc gearing up for change). Germany launched 'Industry 4.0'.

Chart 3 –How ready is India for Industry 4.0

(Source: Irudayaraj (2017), 'A Whitepaper on Industry 4.0 – A Talent Perspective')

Why should India adopt Industry 4.0?

Chart 4- IOT Importance by Industry



(**Source:** Irudayaraj (2017), 'A Whitepaper on Industry 4.0 – A Talent Perspective').

INDIA'S PREPARATION FOR INDUSTRY 4.0

- The transformative journey of manufacturing through Industry 4.0 has already begun due to India's strength in the field of Information Technology.
- Under the Government of India's 'Smart Cities Mission', 100 smart cities are being built across India as forerunners of the I4.0 environment.
- The government in the Union Budget of 2018-19, announced that NITI Aayog will create a road map for the National AI programme focussing on developing new AI applications.
- According to IBEF, India is planning on increasing the contribution of manufacturing sector from the current level of 16% to 25% of Gross Domestic Product (GDP) by 2025.
- The Make in India programme is helping India tackle global competition and lead the world with Smart Manufacturing. In order to help SMEs implement Industry 4.0, the heavy industries and public enterprises ministry are facilitating the establishment of four centres in the country.
- After receiving funding from the Boeing Company, The Indian Institute of Science (IISc) is building India's first smart factory in Bengaluru.
- **B**osch has begun the implementation of smart manufacturing at its 15 centres in India.
- The Andhra Pradesh government plans to set up 10 Internet of Things (IoT) hubs with the participation of the private sector making the state into an IoT hub by 2020.This will create an employment for 50,000 people various IoT verticals.
- Some sectors in India which already adopted Industry 4.0 are FMCG, telecom, manufacturing, healthcare etc.

IMPACT OF INDUSTRY 4.0 ON HRM AND TALENT MANAGEMENT

DIGITALISATION & HRM

Technological advances are rapidly changing the way both private and public organizations operate from how they communicate with their customers, stakeholders, and suppliers to how they manage their human capital in the different stages of the employee life cycle. The advances in digital technologies include cloud-computing systems, social networking platforms, big data analytics, and mobile applications. The integration of these digital technologies into a business environment, the so-called digitalisation, will trigger a number of changes in how Human Resource Management (HRM) is done in the future.

Stolterman and Fors, (2004) described digitalisation, as the changes associated with the application of digital technology in all aspects of human society. The combination of "Technology & Human" creates magic. Machines have objectivity; humans have passion. The relationship of these two has disrupted the HR space .Digitalisation frees HR managers and professionals, from long HR processes and enables them to focus on the activities that have more strategic value to their businesses. Introduction of new technologies and software applications by companies like Fitbit, chatbots and data analytics are helping them in the hiring process, promoting their personal brand, striking a work-life balance among employees.

As Boudreau (2015) aptly put it, the HR profession is at a tipping point and in order to be able to add value, HR professionals need to re-evaluate their competencies and skills. HR professionals lack the technological and analytical capabilities that hinder the HRM digitalisation. It is not enough to just implement a fancy HR technology system alone, complementary investments in redesigning HR processes, developing new HR content, and training leaders and HR professionals are more than essential (Bersin et al., 2015). The core HRM tasks of every organization regardless of size or

industry are to attract, recruit, develop, motivate, and retain top global talent. If these asks are not executed well, organisational performance will be severely affected.

CURRENT TRENDS IN HRM DIGITALISATION

Trend #1 Globalization of the HR function: Companies are being challenged to leverage their internal processes and talent more efficiently. In a highly mobile and global environment having a unified strategy for an international workforce becomes critical.

Trend #2 Moving to the cloud: A cloud-based system offers prompt access to applications in a personalized, self-service, connected, and secure environment. Five main ways HR processes and tasks are enhanced by the cloud are recruiting technology, on boarding technology, HR administration, employee and HR performance, professional development etc.

Trend #3 Utilization of social media: Social networking platforms, such as LinkedIn, Facebook, Twitter and Glassdoor, offer extended recruitment reach to candidates, improved employer attractiveness, and enhanced communication between prospective and current employees, while allowing companies to collect additional employee data and feedback. Social media has the potential to foster workforce collaboration, learning and development, creation of a networked organization in which employee voices have better chances of being heard.

Trend #4 Emergence of mobile: The demand for mobile applications has been increasing due to the potential benefits associated with flexibility and user-friendly interface. Similar to cloud-computing systems (Software-as a-Service) and social media, mobile applications may be utilized for performing a number of HRM tasks.

Trend #5 Big Data and HR Analytics: Big Data and HR analytics could potentially become a source of evidence-based HR decisions and powerful tools for workforce analysis, forecasting people management needs, and assessing HRM-related investments. Specifically, HR professionals have access to historical and real-time data which, if properly analyzed, may be translated into hard evidence for their reports and presentations increasing their overall credibility.

Trend #6 The future workforce: Cognitive technologies, Artificial Intelligence, and Robotics will be the newest recruits to the global workforce. The future of workforce will be based on a combination of people and machines and the HR function will also have to adapt to this new reality and learn to coordinate the work between them.

EXAMPLES OF DIGITALISATION

Reliance Jio, the 4G telecommunications and digital services company is the perfect example of digital transformation. Digital-first HR programme was used which allowed employees to complete the tasks with the help of real-time apps and cloud-based services. They automated and streamlined all their HR processes, technologies (including SAP and a series of cloud apps such as Salesforce.com), policies into a single application.

INDUSTRY 4.0 AND ITS EFFECT ON HRM PRACTICES

Due to Industry 4.0, organizations face many economic, social and technological challenges, which require dynamic capabilities and innovative work force management practices. These practices are as discussed below:

1. **Organizational structure**: Industry 4.0 is characterised by an unstable changing environment, and is compatible with the organic design of organization which is characterized by

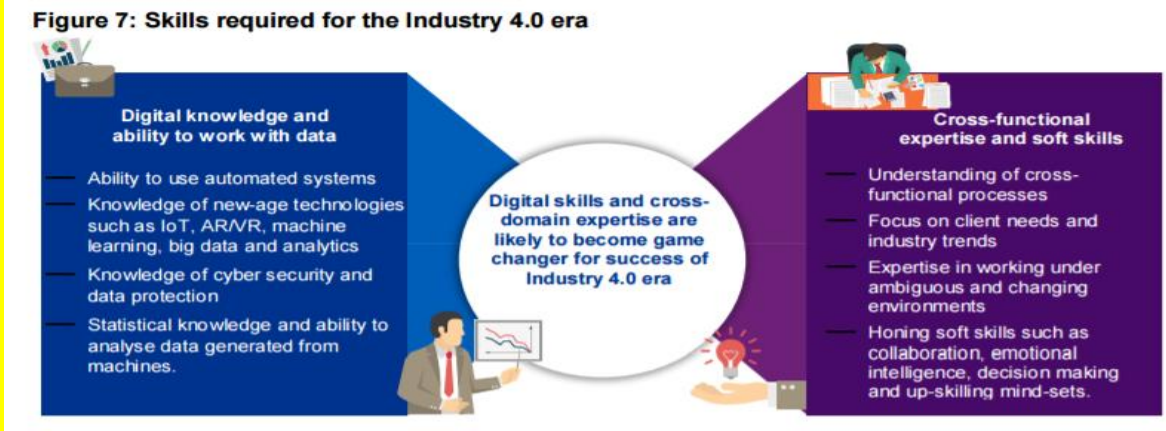
decentralization, empowerment, few rules and formalities, horizontal communication, and collaborative team work, flat hierarchy .The structure can be a matrix structure, project teams etc.

2. **Leadership style:** Innovative role modelling, knowledge diffusion, supportive behaviour, delegation, consulting, and mentoring needs to be added to the construct of knowledge oriented leadership in the industry 4.0.
3. **Human Resource (HR) practices**: Managers can enhance the innovativeness, knowledge management capacity and learning among employees by designing the following HR practices: performance appraisal, job design, staffing, compensation and training.
4. **Focusing on short term innovations, but long term capabilities**: Nature of the projects in industry 4.0 is characterized by short developmental periods hence organizations and employees should change their direction according to the changing situations.
5. **Willingness to abandon investment and knowledge**: Learning and innovation are the critical success factor in industry 4.0, and sometimes it requires a willingness to abandon knowledge, experience, and investment to accommodate new technology.
6. **Re-skilling:** The wave of technologies and the digitisation has transformed sectors and the skill set needed for the future workforce. The National Association of Software and Services Companies (NASSCOM) projections reveal that about 40 per cent of the IT/ITES and BPO workforce in India, which is1.6 million will need to re-skill themselves over five years (Source: Dadhich (2018) .The requirement of new skills will extend to all sectors.

RE-ENGINEERING THE TALENT POOL FOR INDUSTRY 4.0

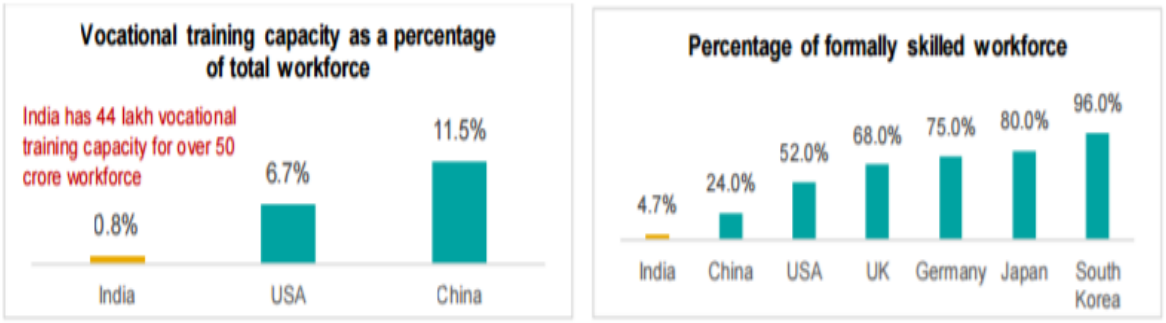
Industry 4.0 transformation reforms the day-to-day tasks for employees. According to the McKinsey Global Institute report (2018), more than 375 million workers may need to completely change their skill sets by 2030, this is due to newer technology like AI, digitization and automation disrupting work .The main pillars of the talent shift are based on up-skilling ability, better leadership, Learning &Development (L&D) platforms and cross-function collaborations. A well-thought L&D strategy is as important as technological upgrades. Employees will look into the supervision of processes and other activities and reduce the amount of time spent on of repetitive manual work.

Chart No.5: Skills required for the Industry 4.0 era



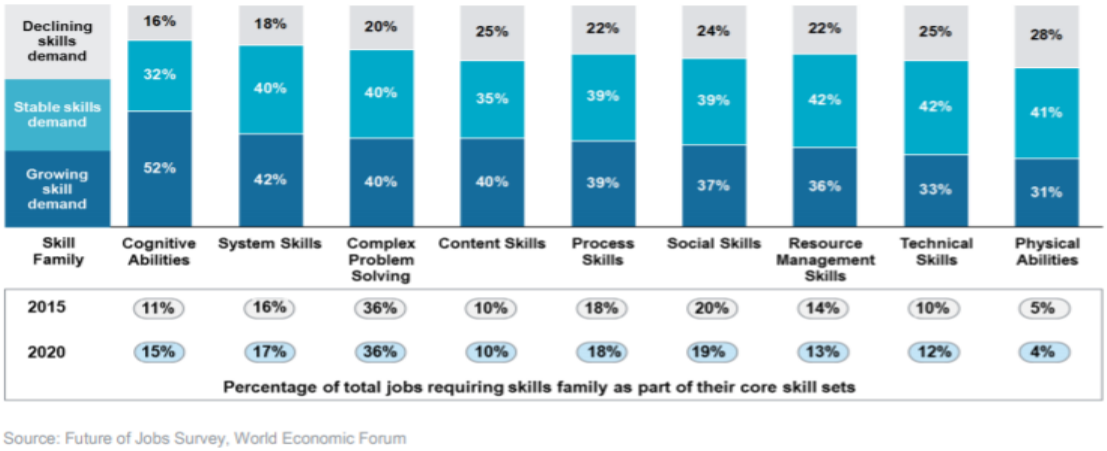
(Source: AIMA & KPMG Report (2018))

Chart 6: Vocational training and percentage of a formally skilled workforce



(Source: AIMA & KPMG Report (2018)).

Chart 7: Future of Jobs: Skills required:



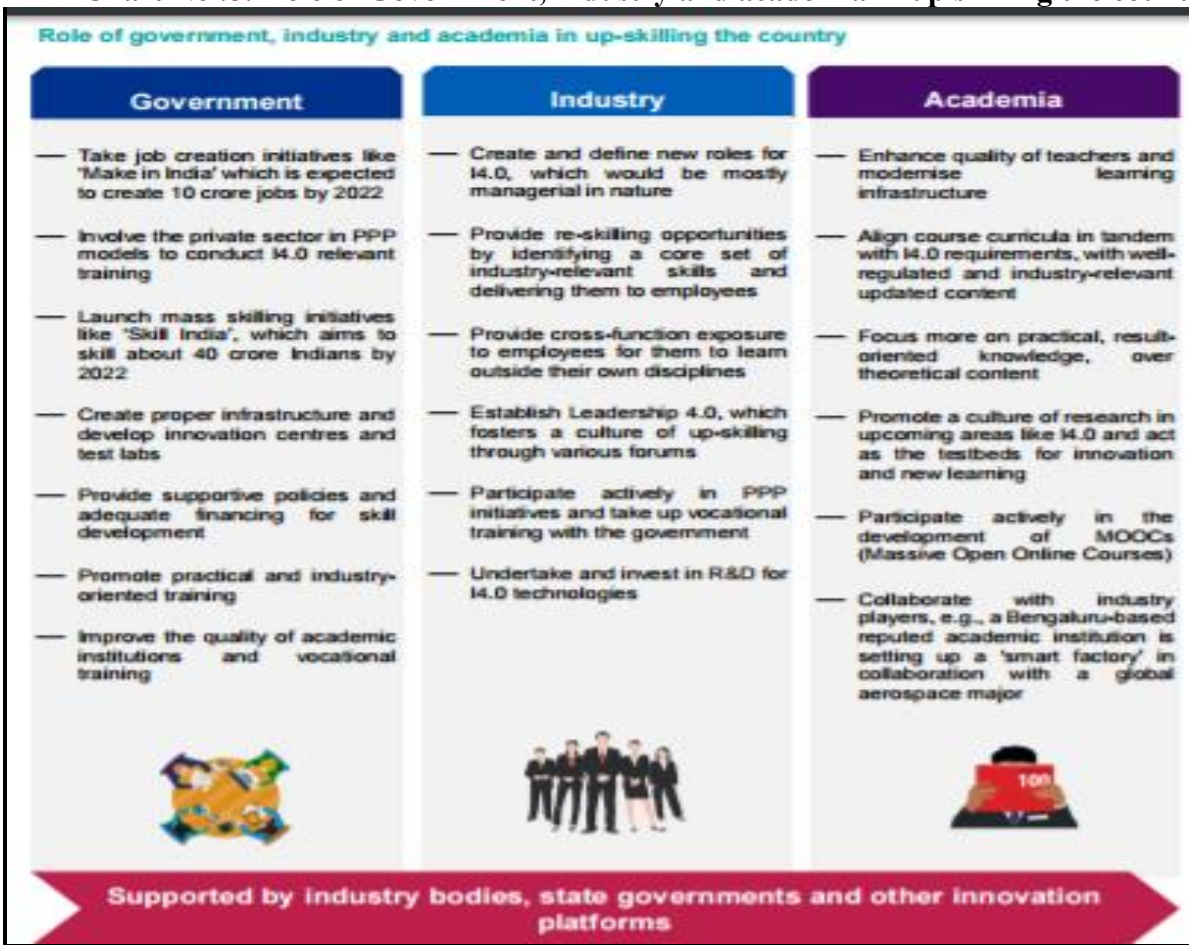
(Source: World Economic Forum (WEF) Global Challenge Insight Report (2016))

- **Up-skilling the workforce:** India is struggling with low vocational training capacity and has a very low percentage of formally skilled workforces. It needs to develop a robust training infrastructure to ensure up-skilling of its existing workforce. Automation could replace 'low-skilled' and repetitive jobs, leading to redundancies in the workforce unless suitably up-skilled to handle tasks in the I4.0 era. I4.0 could create new jobs and roles that are likely to be supervisory, managerial and cross-functional in nature demanding diverse skill-sets. Hence, **up-skilling** in the I4.0 era is essential for a country like India which has a workforce of 50 crores.

JOINT ACTION NEEDED TO UP-SKILL INDIA

I4.0 is likely to create widespread disruptions in the labour market. India needs to address the concerns of demand–skill gap and nullify the impact of automation on the employment scenario. Several domains, such as cognitive, robotics, advanced automation, Industrial IoT needs to be developed and this will require collaborative efforts of the key stakeholders from the government, industry, academia and individuals.

Chart No .8: Role of Government, industry and academia in up skilling the country



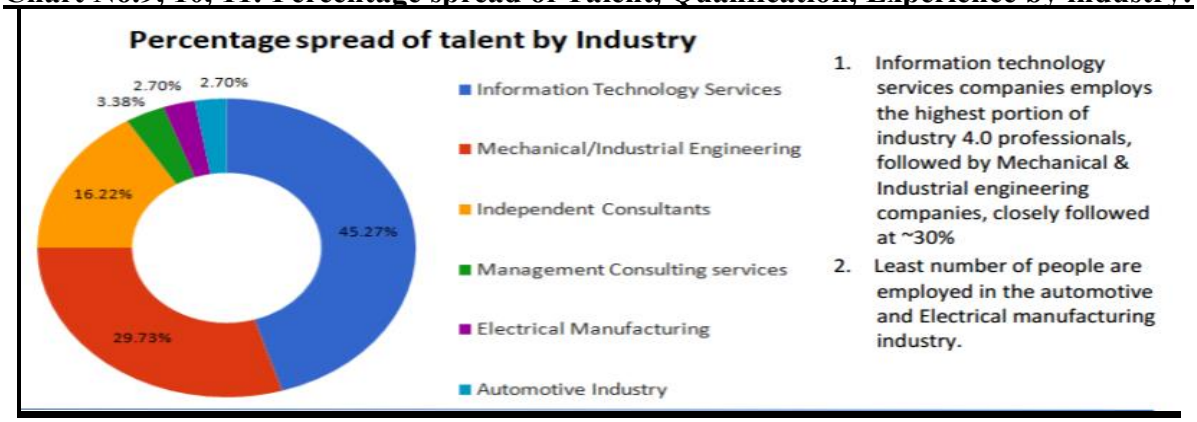
(Source: AIMA & KPMG Report (2018))

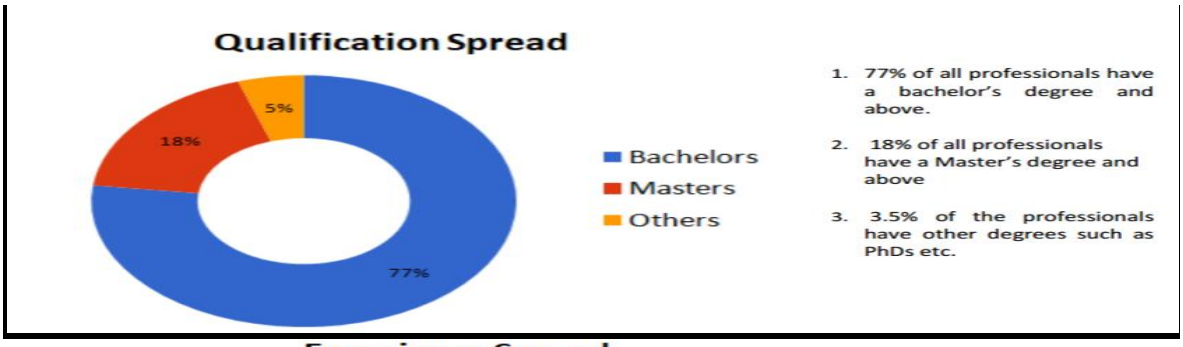
INDUSTRY 4.0 TALENT SCENARIO IN INDIA

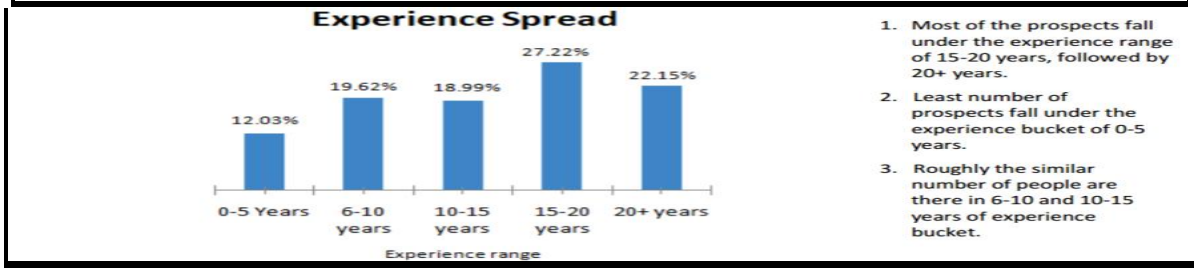
The talent scenario in Industry 4.0 landscape is in a transitional phase. Employees trained in the respective technologies help organizations realize their transformation towards industry 4.0 and eventually to smart factories in India. People with relevant domain skills are readily available in the market, but they do not possess the relevant data science or digital experience. One possible solution to this situation is to collaborate with domain leaders from relevant industries such as oil & gas, aerospace or automotive as subject matter experts and hire Digital/Data Science experts below them with a top down approach to build the team. It can be done with a bottom-up approach as well.

TALENT LANDSCAPE INSIGHTS IN INDIA: INDUSTRY 4.0

Chart No.9, 10, 11: Percentage spread of Talent, Qualification, Experience by industry:







(Source**:** Irudayaraj (2017), 'A Whitepaper on Industry 4.0 – A Talent Perspective'**)**.

RECOMMENDATIONS FOR TALENT DEVELOPMENT IN THE INDUSTRY 4.0

The individual is always at the centre of change, in the industry, government as well as the academic front, hence there is a need to strive for excellence, innovation and a positive change.

- **For the Industry Front**:

1. Re-skilling and up-skilling the existing workforce.

2. Recognition of Innovation and excellence.

- **For Industry associations**: They should focus on initiatives like identifying technological developments, infrastructure and political needs, assess impact on sectors and plan a workforce up-skilling road map. The associations could also work closely with the government to facilitate faster adoption of I4.0 in India.

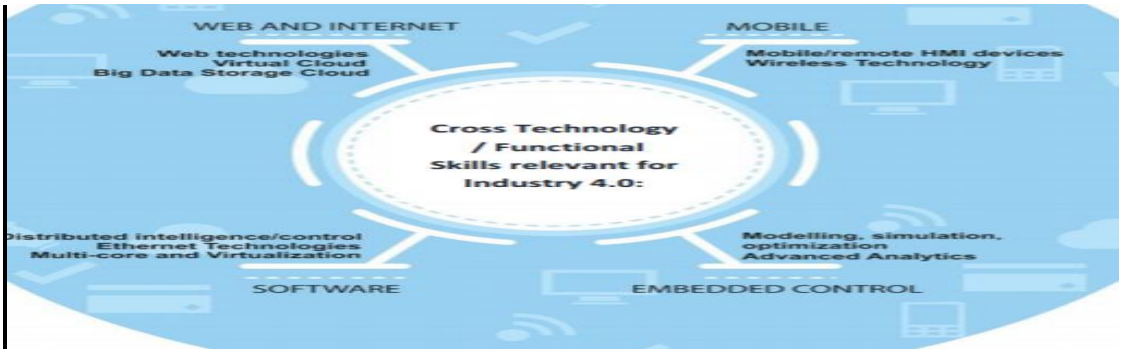
- **For the Academic Front**:
  - Shifting the pedagogy from theoretical exercises to practical, real world problem solving, setting up incubation centres (so that students can acquire real world skills based on company projects).
  - Creating dedicated programs within Institutes. (Ex**: Indian Institute of Technology, Madras** and **Indian Institute of Management, Bangalore** together have launched a unique **Certificate Programme in Technology and Management, which is an** active learning experience of cross-functional technical and business skills.)
- **For the Government Front:**

1. **As an Enabler** :
   - Encourage, promote and support original research aimed at developing technologies in emerging areas.
   - Mandate an industry-oriented curriculum in state-driven education boards at a graduation level.
   - Bolster the vocational training infrastructure in partnership with the private sector and include elements of I4.0 in vocational training.
2. **As a Facilitator:**
   - Set up a dedicated wing in the Industry Ministry to oversee and promote Industry 4.0 adoption.
   - Establish and connect with a network of 'testlabs' that will work with enterprises, industry bodies, government, academia, labour organisations, and the wider community to advance I4.0, in India and the world .
3. **As a Policy-maker** :
   - Provide financial incentives and aid for MSMEs like tax breaks, subsidies etc to make I4.0 affordable.
   - Encourage the advancement of such initiatives like establishing Smart cities, Digital India and Make in India to improve telecommunications infrastructure to ensure seamless IoT implementation.
   - Formulate adequate cyber security policies
   - Encourage FDI and improve ease of doing business.

2. Taking a Long-Term View of Reskilling: As the business landscape is transformed by automation, algorithms and emerging digital platforms, organisations need to assess the impact of digitization on their talent pools and should create a blend of technology and talent in order to succeed.

3. Creating a Culture of Learning: With technology evolving faster than ever, and its impact becoming more pervasive, there is a strong need for continuous learning. If employees need to be updated with the latest skills, it is important that organisations create a culture that encourages continuous learning.

4. Cross Technology / Functional Skills relevant for Industry 4.0: Companies need to balance automation while retaining talent and fostering innovation. A survey conducted by Cognizant and the Economist Intelligence Unit (EIU) found that 94% of respondents had a moderate or severe digital skills gap, which is hampering their organization's efforts to go digital and hence organisations need to look into reducing this skill gap.



(Source**:** Irudayaraj (2017), 'A Whitepaper on Industry 4.0 – A Talent Perspective').

CASE STUDY

Tata Consultancy Services (TCS): Is one of the largest private employers in the country and the world's third-largest in the technology sector. It believes that **HR** is the key in transforming the enterprise and has the potential to bring, in house digital capabilities to drive business improvements. It has a strong in-house talent development programme and trains employees on digital skills, so far 240,000 of TCS 389,213 employees have undergone its skill up gradation programme, which has greatly contributed to its growth (Source: Rediff.com, 2017).

The Four pillars of digital transformation at TCS

HR Functions	Social	Mobile	Cloud	Big Data
Recruiting	• HR has adopted social sites for recruiting. • LinkedIn offers enterprise recruiting tools. • Connects to a vast network of the best recruits. • Involves the entire organisation in recruiting.	• Mobile allows employees to capture business card/CV information via mobile devices wherever they may be (conferences, network events) and directly submit the contact information to HR to initiate recruiting.	• HR can streamline the recruitment process with cloud-based collection of contact information and employment applications. • Cloud- based solutions enable seamless collaboration with other departments and access to information throughout the recruiting and interviewing process.	• Helps HR identify potential recruits by analysing information from social sites, blogs, websites, whitepapers and presentations posted online to help find individuals with the necessary skill sets. • Big data analytics can build more reliable, predictive profiles for hiring.
On-boarding	• Helps new employees find Subject	• Employees can submit new hire documentation via	• HR Streamlines the new hire process with	

	Matter Experts within the company easily.	mobile and track status from anywhere.	cloud based gamified applications to sign up for benefits etc.	
Performance	• Huge potential in leveraging social and game mechanics to drive employee performance.	• Mobile apps enable employees to track their performance and receive real-time feedback from anywhere.	• Social and gamified applications run from the cloud, enabling remote access, driving social influence.	• Enables performance systems to process unstructured data to identify and reward quiet achievers.
Development	• Social capabilities let the employee mentor and be mentored. • High achievers are identified, so that others can emulate their behaviour.	• Receive training via mobile devices anytime and anywhere.	• Training is delivered on demand in a gamified environment in multiple formats as per learning styles of the employees (video, text, experiential etc).	• Development mentors are identified through an analysis of unstructured data like email and documents based on subject matter expertise, as well as likes and dislikes.
Attrition	• Social listening and sentiment analysis helps gauge employee morale and employee satisfaction.			• Process unstructured social data, to identify dissatisfied employees.
Curate Company Knowledge	• Information is readily available in the organisation. • Employee can collaborate and provide information on projects,	• Company information is accessible via mobile for real time access collaboration.	• Cloud based document repositories help in searching, collaborating on, and updating information.	• Helps employees to find information they did not know existed by identifying and recommending related

	documents, policies etc.			documents.
Organisational change	• Is driven by influencers in the company rather than management. • Social listening helps management track acceptance or resistance to organisational change.	• Mobile apps bring on the go employees into the social conversation to support and influence organisational change.	• Cloud enabler of social and mobile applications to speed up adoption of organisational change.	• Natural language processing powered by big data analyses the sentiments about organisational change through multiple sources like (email, social etc).

- In 2016-17, **digital technologies earned TCS $3 billion in revenue**, which is 16% of the total income it earned that year, which was 29% more than TCS's 2015-16 figures for digital technologies (Source: Karnik (2017)). TCS reported its consolidated financial results according to IFRS and Ind AS, for the Q2 ending September 30, 2018 that digital revenue is at 28%, up 60% Y-o-Y (Source:www.tcs.com).
- **Re-skilling at TCS:** TCS provides digital services to over 55% of its customers (2017, annual report). Some of the digital services are social media, mobility, analytics, big data, cloud, artificial intelligence, and internet of things. To meet the evidently growing demand, TCS has trained 200,000 employees until now in over 600,000 competencies in digital technologies. Form the experienced employees the company picks candidates based on market demand and client specifications. Every quarter, employees with some contextual knowledge of the skills are chosen. Example: A candidate with good business intelligence background will be considered to re-skill on big data. Skill developments of fresh engineers are also looked at. TCS is adopting perpetual learning, without time limits. This new focus on re-skilling has reduced TCS's reliance on recruiting experienced persons.
- **Overhauling the interview process**: To ensure that its fresh hires are digitally focussed TCS is collaborating with many engineering colleges to upgrade the curriculum. The interviewing, selection process and the manner in which they are up-skilling them even before they enter the company, has become digital-focused. According to Global HR head and EVP of TCS Ajayendra Mukherjee, Analytics, IoT (Internet of Things) and automation is changing the entire delivery process and TCS is hiring in an agile way which is on-demand.
- CHROMA™ is a TCS talent management platform that helps in establishing a collaborative work culture and effectively manages the talent base. It helps organisations who use an integrated competency based talent management approach to manage employees from hire to retire (lifecycle events).

Talent Core	• Manages organisational structures and reporting hierarchies. • Ensures better management of employee lifecycle events through Organization Management and People Management respectively, • Simplifying time management process by Attendance and Leave Management.
Performance Management	• Feedback driven transparent Performance Appraisal. • Competency-based employee career development.
Talent Acquisition	• Sourcing multi-channel recruitment (candidate portal, agency access, referrals and job boards). • Interview scheduling, assessment and offer management. • Seamless on boarding process.
Talent Development	• Enabling multi-channel and skill-based learning programs • Collaborative learning, • Integrated leadership development modules to ensure succession planning.
Compensation	• Aiding compensation budget allocation, • Pay benchmarking, • Related reporting and analysis.
Competency Management	• Creating employee competency based roles. • Managing talent effectively across various competencies and skill sets for different job roles.
Voice	• Enables employee surveys to create a collaborative, engaging and feedback driven environment.

CONCLUSION

The adoption of Industry 4.0 in India is still at a nascent stage. Some of the challenges faced are the need for high investment outlay, inadequate knowhow, lack of infrastructure, lack of adequate cyber security norms, leadership skill gap and workforce skill gap. The key stakeholders like the government, industry and academic institutions need to come together to re-think the way education system functions and encourage re-skilling in order to make employees competitive. Some initiatives by the government like The "Make in India programme", 'Smart Cities Mission', IISc building India's first smart factory in Bengaluru, Andhra Pradesh planning on setting up an IoT hub etc are helping India in adopting I4.0 .

The integration of digital technologies into the business environment, the so-called **digitalisation**, has lead to a number of changes in the practices of Human Resource Management (HRM) which include cloud-computing systems, social networking platforms, big data and HR analytics, mobile enabled technologies, coordinating work between machines and men, re-skilling, up skilling and creating a culture of learning in the organisation. Digitalisation has helped TCS in streamlining their talent requirements and increasing the company's revenue.

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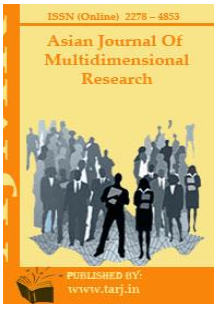

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LEADERSHIP AND RISK MANAGEMENT: A STUDY ON THE ENTREPRENEURIAL QUALITIES

Dr. R. Krishna Kumari*; Ms. M.Vinothini**

*Head & Assistant Professor,
Department of B.Com (CA) and M.Com,
PSGR Krishnammal College for Women,
Coimbatore, Tamil Nadu, INDIA

** Research Scholar,
PSGR Krishnammal College for Women,
Coimbatore, Tamil Nadu, INDIA

ABSTRACT

India has a significant and unique demographic advantage which is potential enough to innovate, raise entrepreneurs and create jobs for the benefit of the nation and the world. In the recent years, the Government of India has introduced a wide spectrum of new programmes and opportunities to nurture innovation, to make India as a job creating nation and to enable a large number of Indian youth to take up industry-relevant skill training that will help them in securing a better livelihood such as, Startup India, Atal Innovation Mission, Support to Training and Employment Programme for Women (STEP) Scheme, Pradhan Mantri Kaushal Vikas Yojana (PMKVY), "Trade Related Entrepreneurship Assistance and Development" (TREAD).The present study is undertaken to identify the leadership qualities and risk management abilities possessed by the entrepreneurs of Coimbatore. Data is collected from 160 entrepreneurs in Coimbatore through snowball sampling technique. The findings show that most of the entrepreneurs are democratic leaders who involve their employees in decision making and the entrepreneurs give high importance to strategic risk management for succeeding in their business.

KEYWORDS: *Entrepreneurial Qualities, Risk Management, Leadership*

INTRODUCTION

Entrepreneurship is an essential component for the economic progress of a nation as it manifests in different ways by identifying, assessing and exploiting business opportunities. Entrepreneurship creates new firms and renews existing ones by making them more dynamic and drives the economy forward through innovation, competence and job creation and thereby improves the wellbeing of the

society. Entrepreneurship helps to eliminate the unemployment problem, to overcome the problem of stagnation and to increase the competitiveness and growth of business and industries.

STATEMENT OF THE PROBLEM

Coimbatore, a major player in the development of the state, is an important state in India for entrepreneurship that provides tremendous opportunities to entrepreneurs. Percentage of entrepreneurs has been increasing constantly from 14% in 1970 to 61% in 2015 in the Coimbatore city. The entrepreneurial climate in Coimbatore has led to the establishment of several industries in various fields such as textiles, automobile, grinders and mixers, jewelry, engineering industries and construction sectors. The Coimbatore natives have the inborn spirit of entrepreneurship that formed this self-made city a strong and vital one in the entrepreneurship map of the country. An entrepreneur should have good entrepreneurial qualities and skills for successfully running his enterprise. Here, the study focuses on the entrepreneurial qualities possessed by the entrepreneurs of Coimbatore.

SCOPE OF THE STUDY

Leadership and risk management are important qualities of an entrepreneur which helps to maximize efficiency, achieve the organizational goals, create dynamic products, implement new ideas and increase the profit. Since Coimbatore is an established entrepreneurial hub, the study is done to find out the entrepreneurial qualities possessed by the entrepreneurs in Coimbatore city.

OBJECTIVES OF THE STUDY

- To examine the leadership style of entrepreneurs.
- To examine the risk management by entrepreneurs.

RESEARCH METHODOLOGY

Period of the study: The period considered for the study is from September 2017 to March 2018

Sampling technique: Snow ball technique is used as the sampling technique.

Area of the study: The data has been collected from entrepreneurs in Coimbatore city.

Sample size: A total of 160 entrepreneurs have been considered for the study

Data source: Data has been collected from two sources

- **Primary data:** Primary data has been collected from both male and female entrepreneurs by administering a questionnaire
- **Secondary data:** Secondary data has been collected from various journals, books and magazines.

Statistical Tools used for the study

- Percentage analysis
- ANOVA
- t-test
- Descriptive statistics

REVIEW OF LITERATURE

Shyamala (2016) has conducted a study on "Problems & challenges faced by Rural Women Entrepreneurs in India". The study mainly focuses on the problems faced by women entrepreneurs in

rural areas and various factors influencing women to become entrepreneurs. This study identifies that lack of mobility and capital investment are the major problems faced by women entrepreneurs in rural areas. This study also suggests that certain policies should be taken by the government to help the rural women to develop entrepreneur skills.

Soundararaja (2016) conducted a study on "Problems faced by Women Entrepreneurs" to analyze the problems faced by entrepreneurs and the ways to overcome them in the manufacturing, trading and service sectors. The study has been undertaken with the help of primary data and secondary data. The data collection through interview schedule is done using multi stage random sampling method. The study concludes that though the women entrepreneurs face major problems, the government has taken many steps for the growth and support of women entrepreneurs.

Kulkarni and Shilpa (2010) conducted a study on "An empirical study of the barriers for the development of women entrepreneurs in Pune region". The major objective of the study is to find out the various barriers and difficulties the entrepreneurs undergo during the entrepreneurial process. Primary data are used for this purpose and data is collected by stratified sampling. This study suggests that many entrepreneurs are first generation entrepreneurs so if they are guided properly in marketing skills they can market their product in a better way.

RESEARCH GAP

Earlier studies have mainly focused on the motivational factors, problems, opportunities, growth, societal needs, socio economic background, business type, earnings, area of business and the gender influence of the entrepreneurs. There are no studies conducted about the qualities possessed by entrepreneurs. Entrepreneurial qualities are important for the success of an enterprise. Hence this research gap is identified from existing literatures and the present study is focused on identifying the entrepreneurial qualities possessed by entrepreneurs.

FINDINGS OF THE STUDY

TABLE 1- PERCENTAGE ANALYSIS FOR DEMOGRAPHIC CLASSIFICATION OF THE ENTREPRENEURS

Particulars	Classification	No. of Respondents	Percentage
Gender	Male	77	48.1
	Female	83	51.9
Age	Below25 years	41	25.6
	26 to 35 years	70	43.8
	36 to 45 years	26	16.2
	46 to 55 years	13	8.1
	Above55 years	10	6.2
Marital status	Unmarried	95	59.4
	Married	65	40.6
Educational Qualification	Up to school level	33	20.6
	Under graduate level	49	30.6
	Post graduate level	41	25.6
	Professional	28	17.5
	No formal education	9	5.6
Yearly turnover of the enterprise	Rs.5 to 15 lakhs	70	43.8
	Rs.16 to 30 lakhs	54	33.8

	Above Rs.30 lakhs	36	22.5
Family Type	Joint family	142	88.8
	Nuclear family	18	11.2
Number of Family members	Below3 members	49	30.6
	3 to 6 members	68	42.5
	Above 6 members	43	26.9
Nature of Business	Sole proprietorship	55	34.4
	Partnership	72	45.0
	Joint stock company	33	20.6
Type of Business	Manufacturing products	80	50.0
	Trading products	48	30.0
	Service providers	32	20.0
Total		**160**	**100**

Source: Primary Data

The above table shows that 52.9 percent of the respondents are female, 43.8 percent of the respondents are in the age group of 26-35 years, 59.4 percent are unmarried, 30.6 percent of the respondents have done under graduation, 43.8 percent generate yearly turnover of Rs.5 to 15 lakhs, 88.8 percent are in joint family, 42.5 percent have 3 to 6 members in their family, 72 percent are involved in partnership business, 80 percent are involved in manufacturing products.

OBJECTIVE 1: To Examine the Leadership Style of Entrepreneurs

TABLE 2 - DESCRIPTIVE STATISTICS - LEADERSHIP STYLE

Statements	No.	Minimum	Maximum	Mean	Std. Deviation
I Regularly supervise my employees with strict rules and regulations	160	1	3	2.03	.648
I work with my employees after directing their jobs	160	1	3	1.82	.915
I take my employees' views for decision making	160	1	3	2.28	.669
I understand their personal trait and assign the work to them	160	1	3	2.20	.875
I control my employees with sectional sub leaders	160	1	3	2.24	.909
I promote my employees not only based on their work experience but also their skills	160	1	3	2.09	.893
I motivate my employees with increased pay	160	1	3	2.23	.933
I communicate with my employees with empathy	160	1	3	2.24	.989
I provide motivation for their self-management	160	1	3	2.18	.937
I punish my employees for their mistakes	160	1	3	1.37	.883

Source: primary data

Interpretation

The above table shows that the highest mean score (2.28) is for the statement "I take my employees' views for decision making". From the mean values it can be further observed that the entrepreneurs communicate with empathy and establish control over their employees through decentralization of authority. It shows that most of the entrepreneurs are democratic leaders and involve in participative decision making. The lowest mean score (1.37) is for the statement "I punish my employees for their mistakes" which shows that a few number of entrepreneurs are autocratic.

TABLE 3 - ANOVA AND T-TEST FOR DEMOGRAPHIC AND BUSINESS VARIABLES VS LEADERSHIP STYLE

H_0: There exists no significant difference in the leadership style of Entrepreneurs based on Demographic and Business variables

Variables	Source	Mean	S.D	No.	T-value	F-Value	Table value	sig
Gender	Male	1.9727	.26981	77	3.847	-	0.88	NS
	Female	2.1578	.33281	83				
Previous employment	Yes	2.0678	.30642	90	0.44	-	0.231	NS
	No	2.0700	.33247	70				
Type of family	Joint family	2.0817	.31457	142	1.455	-	.728	NS
	Nuclear family	1.9667	.32720	18				
Marital status	Married	2.0863	.32506	95	.846	-	.941	NS
	Unmarried	2.0431	.30566	65				
Age	Below 25	2.0429	.29858	70	-	1.169	.327	NS
	26 to 35	2.1146	.36644	41				
	36 to 45	2.0769	.31280	26				
	46 to 55	2.1615	.26627	13				
	Above 55	1.9200	.27809	10				
Educational status	Up to school level	2.0576	.30519	33	-	.624	.646	NS
	Undergraduate	2.0388	.29848	49				
	Postgraduate	2.1049	.31301	41				
	Professionals	2.1143	.31939	28				
	No formal education	1.9667	.47434	9				
No of family members	Below3	2.0265	.30192	49	-	1.882	.156	NS
	3 To 6 members	2.1250	.33608	68				
	Above 6	2.0279	.29546	43				
Nature of business	Sole proprietorship	2.0764	.31621	55	-	.215	.807	NS
	Partnership	2.0778	.29656	72				
	Joint stock company	2.0364	.36642	33				

Type of Business	Manufacturing product	2.0063	.25820	80	-	3.239	.042	S
	Trading products	2.1229	.35022	48				
	Service providers	2.1438	.37325	32				
Yearly turnover	Lessthan30L	2.1000	.31709	74	-	.954	.387	NS
	16 to 30L	2.0623	.28300	53				
	Above 30L	2.0091	.36603	33				

NS-not significant S-significance at 5 per cent

Interpretation

From the above table it has been inferred that there exist significant difference in the leadership style based on type of business and there exist no significant difference in the leadership style based on age, gender, previous employment, nature of business, educational qualification, family type, marital status, family members and yearly turnover.

Hence, the hypothesis is accepted for all demographic and business variables except for type of business. It could be seen that the leadership style of entrepreneurs involved in trading and service industry differ significantly from entrepreneurs involved in manufacturing activity. Therefore it is seen that type of leadership style differs based on type of business activity.

OBJECTIVE 2 – To examine the risk management by Entrepreneurs

Type of Risk	Risk Management	To a greater extent		To a moderate extent		To a least extent	
		No	%	No	%	no	%
Strategic risk	I explore future trends and scenarios to understand the strategic risks	96	60.0	49	30.6	15	9.4
	I appoint plan in charge and regular strategy meetings are conducted regularly	51	31.9	92	57.5	17	10.6
	Prepare flexible strategy to get adopted to the changing market	70	43.8	72	45.0	18	11.2
Operational risk	Provide fair remuneration and motivation to employees and guide them	42	26.2	82	51.2	36	22.5
	Maintain association with suppliers and service providers	58	36.2	64	40.0	38	23.8
	Availability of technical team services	53	33.1	66	41.2	41	25.6
Financial risk	Diversified investment	53	33.1	75	46.9	32	20.0
	Budgeting	55	34.4	74	46.2	29	18.1
	Seek help from financial advisors	45	28.1	76	47.5	39	24.4
	Forecast the demand and supply of the market	46	28.8	78	48.8	36	22.5
Reputational risk	Quality Commitment in the product/services	62	38.8	75	46.9	23	14.4
	Maintain Cultural values of the product /service	58	36.2	74	46.2	27	16.9
	Maintain good relationship with all the stakeholders	52	32.5	75	46.9	32	20.0
Compliance risk	*Compliance with the rules and regulation of the product produced/service provided*	44	27.5	82	51.2	34	21.1
	Compliance with tax payments	54	33.8	73	45.6	33	20.6

From the above table it is clear that 60 per cent of the respondents manage their **strategic risk** by exploring the future trends and scenarios, 36.2 per cent of the respondents manage their **operational risk** by maintaining good relationship with the suppliers, 33.1 per cent of the respondents manage their **financial risk** by diversifying their investments, 38.8 per cent of the respondents manage their

reputational risk by maintaining good quality, 33.8 per cent of the respondents manage their **compliance risk** by maintaining compliance in tax payment.

ANOVA AND T-TEST FOR DEMOGRAPHIC AND BUSINESS VARIABLES VS RISK MANAGEMENT

H_0: There is no significant difference in the risk management of the entrepreneurs based on the demographic and business variables

TABLE 5 - ANOVA AND T-TEST FOR DEMOGRAPHIC AND BUSINESS VARIABLES VS RISK MANAGEMENT

Variables	Source	Mean	S.D	No.	T value	F-Value	Table value	Sig
Gender	Male	1.8087	.23955	77	1.615	-	.273	NS
	Female	1.8649	.19970	83				
Previous employment	Yes	1.8340	.21903	90	.252	-	.936	NS
	No	1.8429	.22473	70				
Type of family	Joint family	1.8342	.22692	142	.586	-	.536	NS
	Nuclear family	1.8667	.16803	18				
Age	Below 25	1.8170	.16432	70	-	.884	.475	NS
	26 to 35	1.8195	.32634	41				
	36 to 45	1.8793	.18663	26				
	46 to 55	1.8564	.18022	13				
	Above 55	1.9271	.14941	10				
Nature of business	Sole Proprietorship	1.8229	.21009	55	-	.274	.760	NS
	Partnership	1.8397	.24298	72				
	Joint stock Company	1.8587	.19002	33				
No. of employees	Less than 10	1.8702	.19579	74	-	3.312	.039	S
	10 to 50	1.8451	.20244	53				
	Above 50	1.7537	.28029	33				
Type of Business	Manufacturing product	1.7932	.22215	80	-	4.073	.019	S
	Trading products	1.9056	.19146	48				
	Service providers	1.8479	.23781	32				
Educational status	Up to school level	1.8545	.14856	33	-	.261	.902	NS
	Undergraduate	1.8531	.22068	49				
	Postgraduate	1.8289	.28939	41				
	Professionals	1.8192	.21170	28				
	No formal education	1.7926	.11277	9				
No of family members	Below3	1.8270	.18947	49	-	.878	.418	NS
	3 to 6 members	1.8637	.25139	68				
	Above 6 member	1.8094	.20203	43				

Yearly turnover	Lessthan30L	1.8465	.19272	70	-	.153	.858	NS
	16 to 30L	1.8246	.21129	54				
	Above 30L	1.8409	.28353	36				

NS-not significant S-significance at 5 per cent

Interpretation

From the above table it has been inferred that there exist no significant difference in the risk management based on age, gender, previous employment, nature of business, education qualification, family type, marital status, family members, and yearly turnover except in case of number of employees and type of business. Hence, the hypothesis is accepted in case of all demographic and business variables except for number of employees and type of business.

LIMITATIONS OF THE STUDY

- The study is limited and restricted to Coimbatore city.
- The results are based on primary data that has its own limitations.
- The data provided by the entrepreneurs depends on their mindset.

SUGGESTIONS

- ❖ Though the leadership style adopted by most of the entrepreneurs is democratic, their involvement in the work along with the employees is less. Hence it is recommended to the entrepreneurs to involve themselves in the work along with the employees in a scheduled manner so that it will help them to determine better job descriptions and specifications, analyse the performance and decide training plans and undertake steps for job enrichment and job satisfaction.
- ❖ Importance given to managing operational and financial risks seems to be much lesser in comparison to other forms of risk. Hence, entrepreneurs are suggested to focus on managing these two risks as well.

CONCLUSION

Development of entrepreneurship in a country depends on many factors such as the personality of the individuals, family background, education and opportunities provided by the government through financial loans and subsidies and many more. The leadership and risk management quality of entrepreneurs are important entrepreneurial qualities that will develop and sustain the business. Hence, developing entrepreneurial qualities among the younger generation is primarily important for maintaining the spirit of entrepreneurship. The present study is an attempt to identify the entrepreneurial qualities specifically the leadership and risk management qualities prevailing among the entrepreneurs in Coimbatore. The study results show that most of the entrepreneurs are democratic leaders and the leadership style differs based on type of business the entrepreneurs are involved in. The entrepreneurs manage their strategic risk by exploring the future trends and scenarios, operational risk by maintaining good relationship with the suppliers, financial risk by diversifying their investments, reputational risk by maintaining good quality, compliance risk by maintaining compliance in tax payment. Strategic risk management is the main focus of most of the entrepreneurs and risk management of entrepreneurs differ based on type of business.

Entrepreneurs involved in manufacturing industry differ in their leadership style in comparison to the entrepreneurs involved in trading and service industries. The change in the style is due to the changes in the type of business activity undertaken in these industries. Risk management is provided

less focus in case of manufacturing concerns and where the numbers of employees are more. This could be due to more focus towards production oriented decisions which might take most of the decision making time of the entrepreneurs involved in the manufacturing sector. Hence it is also seen that leadership style of entrepreneurs and risk management is based on type of business activity.

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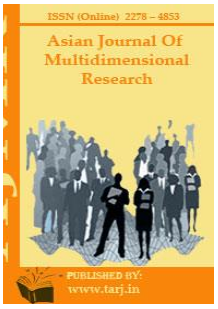

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IMPACT OF INDUSTRY 4.0 ON SUPPLY CHAIN MANAGEMENT WITH RESPECT TO A MANUFACTURING COMPANY IN COIMBATORE CITY

Mrs. P. Sangeetha*; Mrs. M. N. Viveka**

*Assistant Professor,
D J Academy for Managerial Excellence,
Coimbatore, Tamil Nadu, INDIA

**Assistant Professor,
D J Academy for Managerial Excellence,
Coimbatore, Tamil Nadu, INDIA

ABSTRACT

Disruptive technologies are transforming all end-to-end steps in production and business models in most sectors of the economy. The products that consumers demand, factory processes and footprints, and the management of global supply chains are being re-shaped to an unprecedented degree and at unprecedented pace. Industry leaders who were consulted believe that new technological solutions heralded by the Fourth Industrial Revolution – such as advanced robotics, autonomous systems and additive manufacturing – will revolutionize traditional ways of creating value. Since the supply chain will obviously undergo an organizational change, a theoretical framework is necessary to understand which activity is impacted from a holistic management- perspective. Supply chain management is a term that emerged later from the textile industry and grocery industry, and it is used to define the integration of all inbound logistics processes with the outbound logistics, linking all of the partners in the chain including departments within an organization and external partners including suppliers, carriers, third party companies and information system providers. Current research in context of Industry 4.0 mainly focuses on production itself or on production-related logistics processes. However, interconnection across the entire supply chain is required to successfully obtain the potentials predicted for Industry 4.0 Still, supply chain management been scarcely investigated by current research in contrast to solutions based on Industry 4.0 in production. In today's world, the supply chain is a multi-faceted ecosystem linking product development, manufacturing and distribution networks into one fully transparent and digitised system. With multiple streams to take into account, by bringing their supply chain online manufacturers have been able to reap the benefits of a fully automated and integrated supply chain from the very beginning. This paper attempts to address the supply chain management in context of Industry 4.0. A case study design was employed to address the pros and cons of impact of industry

4.0 on supply chain management. The study findings are indicative for further quantitative examination.

KEYWORDS: *Industry 4.0, Supply chain, disruptive, digitization*

INTRODUCTION

The Fourth Industrial Revolution — Industry 4.0 — has begun. The emerging technologies and applications in automated data gathering using the Internet of Things (IoT), machine learning and artificial intelligence, as well as analytics and cloud computing systems in play today are already changing the way we do business. The term "Industry 4.0" was established ex-ante for an expected "fourth industrial revolution" and as a reminiscence of software versioning (Lasi et al., 2014). According to Lasi et al. (2014), Industry 4.0 stands for an advanced digitalization within industrial factories, in form of a combination of internet technologies with future-oriented technologies in the field of "smart" objects (machines and products). This enables and transforms industrial manufacturing systems in a way that products control their own manufacturing process. The high importance of digitalization and the internet is also reflected in the discussions about related concepts such as the "Internet of Things" or the "Industrial Internet". Besides the focus on digitalization, Industry 4.0 is expected to be initiated not by a single technology, but by the interaction of numbers of technological advances whose quantitative effects together create new ways of production (Schmidt et al., 2015). Even though some authors elaborate on unrealistic expectations and fanaticism (Messe, 2013), the potential of Industry 4.0 is expressed in the forecast of fundamental effects on industrial production and significant changes in the supply chains, business models and business processes (Schmidt et al., 2015).

According to Geissbauer, Vedso and Schrauf , the cost of value-creating processes can lead to a 3.6% annual decrease in costs in the future (reduction in lead times, improved asset utilization and improved product quality), in return for spending 5% on digital skills and tools in the next few years. According to (Wang et al.), the implementation of Industry 4.0 requires (1) the horizontal integration of the value chain, (2) a networked production system and vertical integration, and (3) end to end digitization of engineering design along the entire value chain. They believe that these requirements are supported by emerging technologies, including IoT, wireless sensor networks, big data, cloud-based services, embedded systems, and mobile Internet.

Hermann, Pentek and Otto [15] and their co-authors, in their analysis of 50 studies, identified four basic tools needed to implement Industry4.0 within the company. These are CPS, IoT, the Internet of Services and the Smart Factory. These are, in themselves, comprehensive categories, and do not specify the technical tools needed to operate the CPS (e.g., sensors).

The most striking improvements are identified in the areas of competitiveness, innovativeness, flexibility, individuality, and working conditions (PlatformI4.0, 2015).

SUPPLY CHAIN MANAGEMENT (SCM)

Supply chain management is the management of the flow of goods and services and includes all processes that transform raw materials into final products. It involves the active streamlining of a business's supply-side activities to maximize customer value and gain a competitive advantage in the marketplace. SCM represents an effort by suppliers to develop and implement supply chains that are as efficient and economical as possible. Supply chains cover everything from production to product

development to the information systems needed to direct these undertakings. Supply chain management creates efficiencies, raises profits, lowers costs, and boosts collaboration and more. SCM enables companies to better manage demand, carry the right amount of inventory, deal with disruptions, keep costs to a minimum and meet customer demand in the most effective way possible. These SCM benefits are achieved through the appropriate strategies and software to help manage the growing complexity of today's supply chains.

IMPACT OF INDUSTRY 4.0 ON SCM

The supply chain industry is also undergoing a transformation, adopting digitization, automation, and centralized business intelligence systems. According to a study on Industry 4.0, conducted by PwC, almost 33% of 2000+ respondents said digitization of supply chain operations is well underway in their companies. The introduction of cyber-physical systems and the Internet of Things (IoT) is revolutionizing the pace of this transformation in supply chain management (SCM). The development of supply chain visibility solutions for every level — manufacturing, procurement, logistics, warehousing, and fulfillment — has made companies with integrated digital supply chain functions far more efficient than their predecessors. The article details about the impact of Industry 4.0 on each and every component of the process of supply chain management

PLANNING & EXECUTION

The planning and execution phase in SCM focus on end-to-end process and maintaining a balance between supply and demand. Decisions are now more data-driven, and the integration of automated end-to-end data aggregation solutions will be a game changer in deciding the more practical approach. The integration and digitization of operations eliminates silos in enterprises, allowing decision-makers across functions to respond to disruptions in real-time. Whether it's a shortage of raw materials, adapting to a change in market dynamics or customer preferences, identifying (and nullifying) the root cause of inefficiency in day to day operations, or gathering market intelligence to plan for the future, a digital supply chain can stay on top of it all with minimal need for human intervention. Supply chains with an effective ERP solutions and integrated monitoring and tracking solutions can handle day-to-day operations as well as strategic initiatives with ease, giving you the intelligence and insight to be future ready.

PROCUREMENT & MANUFACTURING

Customer demand, manufacturing and holding capacity, and the current supplier landscape, these are some of the factors that affect procurement and its operational overheads. The integration of live demand data from points of sale, current performance and inventory data from manufacturing and holding facilities, as well as up to date information on in-transit raw material or inventory from suppliers can help streamline procurement and manufacturing operations to the point where buffer or safety stock is no longer necessary. Industry 4.0 is all about digitization and the integration of monitoring, tracking, and analytics technologies to enable seamless SCM and improve operational efficiency — both now and in the future — for existing processes.

LOGISTICS

Logistics & transportation management, by far, has the most to gain from supply chain digitization and Industry 4.0. The automated real-time management of a large number of shipments and in-field assets like shipping containers is going to be the next big leap in improving productivity. Real-time shipment tracking solutions will allow supply chain managers to optimize routes, fleets, and field asset utilization in real time, with the added advantage of automation to reduce the need for human

intervention. Automated logistics management systems improve responsiveness to changes that affect throughput, ETA, unnecessary overheads like fuel costs, and the ability to hit narrowing windows of delivery, especially for last-mile logistics.

WAREHOUSING

Industry 4.0 warehouses will function as an autonomous entity, with automation handling the majority of tasks like space management, inventory tracking, and order picking. Simplifying or reducing labor-intensive tasks can boost efficiency and reduced operational overheads. When coupled with end-to-end supply chain visibility solutions for inbound or outbound logistics, smart warehouses can anticipate the inflow of goods and space requirements, requisition assets like personnel or pallets, and update enterprise inventory holding and throughput levels in real time. Warehouse inventory tracking and management systems coupled with other emerging technologies like augmented reality (AR) could also be an option to increase process efficiency. DHL experimented with augmented reality software and smart glasses to improve the order picking process at their Ricoh warehouse facility in the Netherlands. As a result, the efficiency of the picking process increased by 25% when augmented reality was implemented

REVIEW OF LITERATURE:

IMPORTANCE OF INDUSTRY 4.0

Power-generating technology such as robotization and automation has long existed. The Internet, however, revolutionizes process organization by networking robotic and automated devices. The development of the Internet and technology creates a continuous network of people, machines and companies, and through the continuous sharing of value-creating processes; it is now possible to produce a competitive, fully-customized product for the buyer. By Industry4.0, we mean the intelligent networking of industrial products and processes. In 2013, the Frauenhofer Institute reviewed the productivity and growth potential of companies using Industry 4.0technologies. Its main impact comes from five technology areas: Embedded systems, smart factories, strong networks, cloud computing and IT (Information Technology) security.

Rüßmann.et.al, however, collected nine technologies that characterize leading companies in the Fourth Industrial Revolution. These include technical tools and methods. These are automated robots, simulation, horizontal and vertical system integration, industrial IoT, cyber security, cloud-based services, additive production (3D printing), augmented reality, and big data analysis. Today, in an Industry 4.0 factory, machines are connected as a collaborative community. Such evolution requires the use of advance prediction tools, so that data can be systematically processed intoinformation to explain uncertainties and thus make more informed decisions. It can be concluded that the term Industry 4.0 describes different—primarily Information Technology (IT) driven—changes in manufacturing systems. These developments not only have technological but also versatile organizational implications.

IMPACT OF INDUSTRY 4.0 IN SUPPLY CHAIN

Bildstein.et al, Applying more efficient production processes, and achieving better productivity and economies of scale, might also result in increased economic sustainability. Furthermore, we have found that companies have started on the path to digital evolution, and investments of this type have already begun.

The fourth industrial revolution has an impact on the entire company, so it is very important to understand how the various elements of it are able to exploit the opportunities offered by digitization. For a structured presentation of this, there was a need for a theory by which the core process of the company is customer value creation, as this industrial revolution affects first and foremost the various elements of value creation, and—at least initially—affects production most of all. However, we should not forget the corporate activities that support value creation and how these activities can benefit from the achievements of Industry 4.0. There is no sector in any industry that has been left untouched by digitization. Logistics is no exception, and the fourth industrial revolution has brought a tremendous increase in efficiency in this area, as well. From the production line to end use, logistics is everywhere, and now digitization is becoming more and more present. Porter value chain concept (Figure 1) suggests that a company's competitive advantage cannot be looked at in general—it is also necessary to understand the company's internal structure, i.e., how individual business elements contribute to delivering the product or service to competitors at a lower price or higher quality. One of the possible types of the value chain approach is to systematize intra-corporate activities and to find the source of competitive advantage. Not only are the value chains of companies in different industries different, but also different value chains are created by each company operating in the same industry. This structure depends on the company's strategy, its strategy implementation, and corporate traditions. The value that a chain generates is the amount that the product (service) is worth for the buyer. This price must go far beyond cost, which is the basis for every company to survive. Understanding and serving the value-based approach, i.e., customers' needs, is the foundation of corporate strategy. Sustainability systematize intra-corporate activities and to find the source of competitive advantage. Not only are the value chains of companies in different industries different, but also different value chains are created by each company operating in the same industry. This structure depends on the company's strategy, its strategy implementation, and corporate traditions. The value that a chain generates is the amount that the product (service) is worth for the buyer. This price must go far beyond cost, which is the basis for every company to survive. Understanding and serving the value-based approach, i.e., customers' needs, is the foundation of corporate strategy.

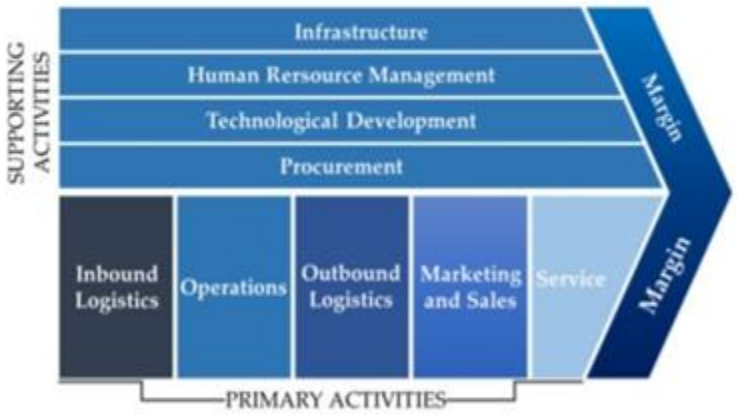

Figure 1. Porter's Value Chain. Source:

In addition to the impact on the company's internal business areas, we cannot ignore the impact of the fourth industrial revolution on business relations. At the level of the supply chain, first of all the relationship between suppliers and customers should be mapped out. According to KPMG, the future

trend will be for former competitors to work together and for sectoral alliances to emerge. The structure of global value-added networks is determined by the strategies of the companies concerned, which are driven by the driving forces commonly found in capitalist conditions and by the efforts to minimize the risks inherent in the external environment. With the help of the Internet, the supplier, the manufacturer, and the customer will create a single digital ecosystem where all relevant data and information can be accessed immediately in the cloud in order to coordinate activities as efficiently as possible. This is not considered a realistic goal in the foreseeable future by the experts consulted. They see a chance of this happening if the supplier, the factory and possibly the customer belong to a group of companies and this creates transparency among the subsidiaries of the central organization and provides them with opportunities for learning and benchmarking. Even if no merging into a single digital network occurs in the near future, we can be sure that relations with suppliers and customers are changing. Customers' expectations come to the forefront for suppliers: They demand speed and flexibility in order fulfilment, and product development. The digital ecosystem also functions further down: It should be accessible in one place. Thanks to cloud computing, production is completely transformed, and isolated production units merge into a fully integrated, automated, optimized, high-efficiency production process, resulting in a change in the relationship between manufacturers, suppliers and customers.

RESEARCH METHODOLOGY

OBJECTIVES

Primary Objective:

- To study the impact of Industry 4.0 on Supply chain management.

Secondary Objectives:

- To understand how supply chain planning is reshaped with the invent of new tools
- To analyse the future of supply chain in manufacturing units

METHODOLOGY

In this research, real life case study on how Industry 4.0 is changing the way business operates of a particular company was considered for the study.

ANALYSIS & INTERPRETATION

Case study method is applied to interpret the impact of 4.0 on supply chain management with special observation of supply chain planning in manufacturing companies and to gain idea on the future of it in various areas of supply chain management

ADVANCED SUPPLY CHAIN PLANNING

A leading Textile Machinery Manufacturer in India and one among the three in the world to produce the entire range of Spinning Machinery, which is located in Coimbatore, caters to the domestic market as well as exports products to the Asian and Oceanic regions.

This company has diversified into CNC Machine Tools and is a brand leader in manufacturing customized products and foundry makes Precision Castings for industries world over. It also has a Centre to manufacture components for the Aerospace Industry.

They have implemented advanced supply chain Planning tool (ASCP) from Oracle which actually shares the workload of the people.

ORACLE ADVANCED SUPPLY CHAIN PLANNING

Oracle Advanced Supply Chain Planning (ASCP) is a comprehensive, Internet-based planning solution that decides when and where supplies (for example, inventory, purchase orders and work orders) should be deployed within an extended supply chain. This is the supply planning function. Oracle ASCP addresses the following key supply planning issues:

- How do we plan our supply chain in the least amount of time possible?
- How do we minimize the number of plans and iterations?
- How do we plan the entire supply chain?
- How do we involve the trading partners?
- How can we access the plan from anywhere?
- How do we keep improving the plans?
- How can we plan all manufacturing methods?

The key capabilities of using this method are:

Holistic Optimization, Planning, and Scheduling

It can plan all supply chain facilities simultaneously. Short-term detailed scheduling and long-term aggregate planning are supported within a single plan. This single plan also supports multiple manufacturing methods, including discrete, flow, project, and process manufacturing.

Finite Capacity Planning and Scheduling

It generates feasible supply chain plans that consider both resource and material constraints.

Optimization

Users can easily configure it to optimize specific business criteria. No programming is necessary to access ASCP's powerful mathematical optimization capabilities.

Backward Compatibility

Its component architecture allows it to be deployed against any version of transaction systems.

Workflow-Driven Exception Messaging

The exception messages alert planners to critical issues across the extended supply chain. Workflows that drive these exceptions route data to and get feedback from trading partners as required, thus effectively involving them in the supply chain planning process.

Global Accessibility

Its database-centric architecture stores plan data in a central planning server database. These data are accessible from anywhere via a simple browser. It is possible for multiple planners to simultaneously access data from a single plan.

Integrated Planning and Execution

Advanced Planner Workbench user interface not only displays plan results, but also allows planners to execute planning recommendations. Planners do not have to move to the transaction system to perform plan execution.

Simulation Capability

It allows many types of changes to supply, demand, plan options, and resource profiles to simulate changing business conditions. We can generate a plan considering all the changes that have been entered via the Planner's Workbench. Unlimited numbers of scenarios can be simulated and compared using online planning, copy plans, and exceptions. Examples of the types of changes are firming, changing sources, modifying quantities and dates, modifying priorities, modifying resource availability, modifying supplier capacity, and modifying objective weights.

Distribution Planning

Businesses with multi-level supply chains need to fulfill demands from downstream distribution locations and customers from supply plans for their manufacturing and stocking locations. The rules that govern this distribution are different depending on whether the supply is unconstrained or constrained. The distribution planning process is independent of the supply planning process at each source locations.

This process includes generating a:

- Detailed short term (daily) plan: A movement plan for each lane of the distribution network
- Longer term, higher level material distribution plan

The constraints impacting these two plans are the same but the level of detail modeled is quite different.

- In both the short and long term, we must have global visibility to inventory positions in each location in the distribution network (external and internal), to fulfill demand requirements arising at these locations, and be able to react to specific consumption patterns
- In the short term, we must maintain target and maximum inventory levels at each destination location and safety stock levels at each source location to react to demand uncertainties. In all cases, make sure that target and safety stock levels respect maximum levels.

Distribution planning answers the question about where we should deploy inventory when there is excess at our central locations. As needed, the excess inventory is pushed outwards to locations closer to the customer.

In addition, there need to be a fair share rules for supply-constrained items. These fair share rules specify how to cover part of the needs at each of the receiving locations when all of the needs cannot be covered. This process can also be tightly integrated with customers via business agreements such as vendor managed inventory and customer managed inventory and model for customers and supplier organizations can be developed.

Distribution planning works with other Oracle Advanced Planning suite products that can be used upstream and downstream of it:

- Oracle Demand Planning drives independent demands into distribution plans.
- Oracle Advanced Supply Chain Planning manufacturing plans drive supplies into distribution plans
- Oracle Inventory Optimization plans drive time-phased safety-stock information into distribution plans.
- Distribution plans drive Oracle Transportation Management through the release of internal purchase requisitions and internal sales orders.
- Distribution plans provide a statement of product availability to Oracle Global Order Promising.

- Distribution planning interacts with the Oracle Collaborative Planning flows Publish order forecast (both for external suppliers and for suppliers modeled as organizations), Publish supply commits, Receive supplier capacity, and Publish safety stock levels

DISTRIBUTION AND MANUFACTURING PLAN RELATIONSHIPS

For a manufacturing company, it can combine manufacturing plans and distribution plans to plan the enterprise. The manufacturing and distribution plan types are:

Master Production Plans (MPP): They typically include the distribution facilities and not the manufacturing facilities. The master production plan is used to summarize all of the demands for production in the manufacturing plants. Typically, independent demand drives this plan and this plan drives the manufacturing planning and scheduling process.

Master Production Schedules (MPS) and Material Requirements Plans (MRP): They typically include the manufacturing facilities and not the distribution facilities. The master production schedule and material requirements plan is used to plan the full production schedule. Typically, the master production plan drives this plan and this plan drives the manufacturing execution and the distribution planning. For manufacturing planning, either a two-level or a single plan planning approach can be utilized. The two-level approach uses both the master production schedule and material requirements plan; the single plan approach uses the material requirements plan only.

Distribution Plans (DRP): They typically include the distribution facilities and not the manufacturing facilities. The distribution plan is used to schedule transfers with carrier recommendations that moves finished goods across the warehouse network, outwards from the manufacturing plants through the supply chain. Typically, a supply schedule drives this plan and this plan drives the distribution execution. A supply schedule is a master production plan, a master production schedule, or a material requirements plan.

Manufacturer owns a network of distribution centers. The network may also include vendor managed inventories located at customer sites. Oracle recommends:

- A constrained master production plan that includes all manufacturing facilities and all planned items can be driven with global and local forecasts. In order to capture both sales orders and forecasts, there need to include distribution facilities; however, the master production plan does not plan these facilities. A material requirements plan for C-level items can be used based on the choice.
- A distribution plan that includes all distribution facilities and that uses the master production plan as a demand schedule. The supply in the master production plan constrains the distribution plan. The distribution plan does not create new supplies in the organizations planned by the master production plan. It only lists the master production plan as a supply schedule for organizations that have incoming supplies.
- Use the distribution plan to provide a statement of unconstrained demand to the constrained master production plan.

Multi-Plant or Complex Product Manufacturer: Here manufacturer owns a network of distribution centers which includes vendor managed inventories located at customer sites. The manufacturer uses two-level scheduling planning approach. This diagram shows a planning business flow for this business type.

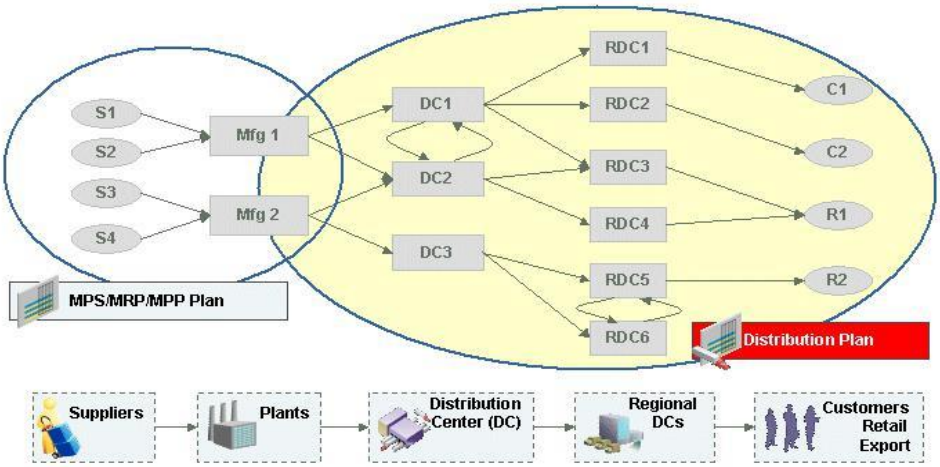

Fig 2 : Business Plan Flow for Multi-Plant Manufacturer

KEY OBSERVATIONS

According to the analysis few constraints that actually influences the distribution planning in manufacturing companies predominantly was found as follows:

Some of the key constraints that influence distribution planning decisions are:

- Distribution rules and fair share allocation rules
- Supplier capacity constraints
- Inventory investments
- Maximum and target inventory levels
- Safety stock levels and service level requirements
- Intransit lead times
- Shipment limit
- Shipping, receiving, and transportation calendars

DISTRIBUTION PLANNING MEETS THESE CONSTRAINTS BY

- Providing fair share allocation of scarce supplies to competing demands
- Modeling multiple inventory levels including maximum, target and safety stock inventory levels
- Rebalancing inventories at regional distribution centers before transferring supplies from a central distribution center
- Consolidating shipments between organizations to improve the utilization of shipment capacities
- Accepting global forecasts and selecting the best facility to meet each demand
- Creating the documents for inter-organization transfers
- Integrating with Oracle Transportation Management to provide detailed transportation planning

KEY BENEFITS FROM USING DISTRIBUTION PLANNING

- Increased ability to react to tight supply situations, for example, delay of supply arrival from a supplier or production shortfalls in manufacturing plants with allocation strategies.
- Improved customer service levels and reduced overall cost of inventory through proactive inventory rebalancing
- Reduced cost of material movement (shipping cost) through load balancing
- Replenishments that dynamically follow consumption patterns
- Minimized inventory write off (wastage and spoilage)
- Improved service levels through fair share allocation
- Improved global visibility and enforcement of inventory and distribution policies
- Improved distribution planner productivity by using the Distribution Planner Workbench and by simultaneous release and reschedule of internal sales orders and internal requisitions

FUTURE OF SUPPLY CHAIN IN MANUFACTURING

The variety of products available through a growing number of distribution channels is truly amazing. Competition between brick and mortar and e-commerce retail channels, often within the same company, has led to a proliferation of products and services. today's manufacturers face a long list of difficult supply chain challenges including increasing demand variability, inventory proliferation, manufacturing capacity constraints, increasing risks both nature and human based, more environmental compliance regulations, intense global competition, increasing customer expectations and a shortage of talent. To survive in today's highly competitive global environment, manufacturers need to piece together the many parts of the supply chain puzzle to lay the foundation for more mature capabilities in the future.

CONCLUSION

Industry 4.0 is still an unexplored market, and its development directions are multibranch. The business models of the functioning of supply chains are changing; the same is applicable for the end product, which is getting increasingly individualized and adjusted to the expectations and taste of the purchaser. This paper provides a comprehensive view of the impact of industry 4.0 on supply chain management with reference to a particular manufacturing company. Some clear benefits can be identified from the implementation of Industry 4.0 as flexibility, quality standards, efficiency, and so on. Hence, this will allow companies to meet customers' demands, creating values. Nevertheless, the majority of companies are hesitant to begin their digital transformation processes due to serious implementation barriers that include uncertainties about financial benefits and a lack of specialist knowledge.

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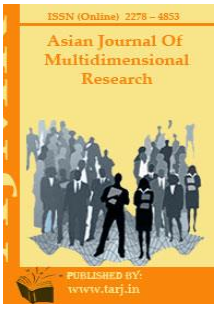

Asian Journal of Multidimensional Research (AJMR)

(Double Blind Refereed & Reviewed International Journal)

UGC APPROVED JOURNAL

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WILL ADIDAS RUN UP TO NUMBER 1 SPOT WITH THEIR SPEED FACTORIES?

Mrs. S. Johnsi*; Dr. Deepa Venugopal; Mrs. P. Sangeetha*****

*Assistant Professor,
D J Academy for Managerial Excellence,
Coimbatore, Tamil Nadu, INDIA

**Associate Professor,
D J Academy for Managerial Excellence,
Coimbatore, Tamil Nadu, INDIA

***Assistant Professor,
D J Academy for Managerial Excellence,
Coimbatore, Tamil Nadu, INDIA

ABSTRACT

Adidas has its roots in Germany but they are a truly global company. Around the world they employ nearly 57,000 people. Employees from about 100 nations are working at their global HQ in Herzogenaurach, Germany – the 'World of Sports'. Every year they produce over 900 million sports and sports lifestyle products with independent manufacturing partners worldwide. In 2017 they generated sales of € 21.218 billion. Adidas Group owns brands like Adidas and Reebok. The adidas brand has a long history and deep-rooted connection with sport. The adidas brand's mission is to be the best sports brand in the world, by designing, building and selling the best sports products in the world, with the best service and experience. Reebok is an American-inspired global brand with a deep fitness heritage and a clear mission: To be the best fitness brand in the world. The past years have been characterized by a transformation from traditional sports to fitness. The three sides of the Reebok Delta, a symbol of change and transformation, represent the physical, mental and social changes that occur when individuals embrace the challenge of bettering themselves in the gym, in their lives and in the world. The shoe and athletic apparel industry is dominated by Nike for a long time but now both the companies are fighting for an edge. Both the companies are conducting extensive research and investing substantial amounts in automation, robotics and artificial intelligence at their plants to increase productivity and cost optimisation. Adidas has planned to gain market share and have an edge over Nike through its robotics technology. This case focuses on

the synergies obtained through Industry 4.0 technology like Productivity, Process improvement and Innovation, Customisation and Cost advantage.

KEYWORDS: *Robotics, Artificial intelligence, Industry 4.0*

INTRODUCTION

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The shoe and athletic apparel industry has been dominated by Nike for a long time but now both the companies are fighting for an edge. Both the companies are conducting extensive research and investing substantial amounts in automation, robotics and artificial intelligence at their plants to increase productivity and cost optimisation.

Adidas has planned to gain market share and have an edge over Nike through its robotics technology. This case focuses on the synergies obtained through Industry 4.0 technology like Productivity, Process improvement and Innovation, Customisation and Cost advantage.

1. BACKGROUND

Nike is an American multi-national company engaged in the manufacturing and marketing of footwear, apparel and sports equipment. The company was founded by a track athlete Phil Knight and his coach Bill Bowerman in Jan 25, 1964. The company was originally called Blue Ribbons Company and was renamed as Nike in 1971. The company's products are sold worldwide, and their revenue reached $34.35 US billion in 2017. Nike also owns Jordon brands, Hurley International and converse. Nike's current strategy is called "The customer Direct Offense" and tries to transfer three core areas of its business innovation, supply chain and market place. Nike recently added new materials like Vaporfly, carbon fibre plate and Zoom X foam. Nike strengthens its relationship with customers by forming direct connections through memberships, personalization and brand experience. Nike also tries to reduce the design to delivery time through better sourcing, automation and closer to market manufacturing.

ADIDAS

Adidas is a German company founded by Adi Dassler in 1924. Adidas key focus is on footwear and the three-stripe logo design is used even now. The company's products are sold worldwide, and their revenue touched € 21.218 billion in 2017. Adidas's subsidiaries include Reebok, Runtastic and Matix. The three pillars of Adidas that drive brand desirability are speed, cities and open source.

Speed refers to Adidas speed in launching new products that matches with the fashion trends and the stock availability. Adidas through its speed factory aims to ensure it responds to changing fashion trends. Cities refer to the places the consumers of Adidas reside. Adidas concentrates on six cities which include Tokyo, New York and London etc., This strategy also focuses on upgrading their stores to produce a better shopping experience to its customers. Open source is the most interesting strategy of Adidas. Adidas engages customers, designers and athletes for ideas and design.

Adidas as well as Nike's products include Footwear, apparel and sports equipment. Table 1.1 shows the products revenue for the companies.

TABLE – 1.1 REVENUE COMPARISONS FOR NIKE & ADIDAS

Products	Revenue - products	
	Nike	**Adidas**
Footwear	66%	59%
Apparel	30%	36%
Equipment	4%	5%

(Source: www.ig.com -29th March 2018)

Nike and Adidas generate most of their sales from Footwear and apparel and a meagre amount from equipment sales. The global sports apparel market expected to generate revenue of $184.6 billion in 2020 and it grows at a CAGR of 4.3% during 2015-2020.

2. SPEEDFACTORY

In the speed factory the shoe design process is digital, with shoes designed on a computer and the shoes are tested for fit and performance. Parallelly, another computer will test the production process to make it as efficient as possible. The factory will make majority of the materials in house, using raw goods such as plastics and fibres. Once the design is complete, the machines will use computerized knitting, robotic cutting, additive manufacturing, and 3D printing to quickly assemble the shoes directly from the computer's design. This minimizes the setup times and switching costs that typically come with producing multiple shoe designs, which can save hours, if not days, in labour time.

2.1 PRODUCTIVITY AT SPEED FACTORY

According to Forbes smart factories will improve the overall productivity by 7x times and it has the potential to add between $500 billion to $1.5 trillion in value to global economy.

In the long-drawn process of procuring, manufacturing and distribution for Adidas prototyping consumes more time. In the traditional setup the suppliers and manufacturers for Adidas physically verify the raw materials, try out the product and then return it to Adidas. When the product is required to be modified again the process time is lengthened. To reduce the time in prototyping Adidas has come out with the concept of speed factory.

Adidas combines 3D design and 3D printing in their speed factory to bring down the prototype testing time from months to days. Usually the product lines are switched off during reprogramming or retooling of machinery but in the speed factory robots are allowed to do the time-consuming repetitive tasks which in turn reduces the downtime in their factories.

2.2 SUPPLY CHAIN PROCESS IMPROVEMENT

The sports shoe industry has not managed with the changing expectations of the consumers and the fashion trends. The lead time from initial sketching, prototyping the model, model testing, raw material ordering, manufacturing in China Vietnam or Indonesia and transporting to the markets taken by sports shoe industry for a sneaker is almost 18 months. The stock replenishment at the retail end takes almost 2 to 3 months. The new motto of Adidas is to produce the apparels as well as sports goods fast. The new speed factory produces apparels and shoes in a matter of few hours. Not only the designing and manufacturing time the shipping and delivery time also has reduced.

2.3 PROCESS IMPROVEMENT AND INNOVATION

Innovation is a pre-requisite for a sporting company like adidas. Adidas not only focuses on the product innovation but also on innovating the customer experiences and services. Within the innovation principles they have identified five strategic pillars for development.

Five pillars of innovation

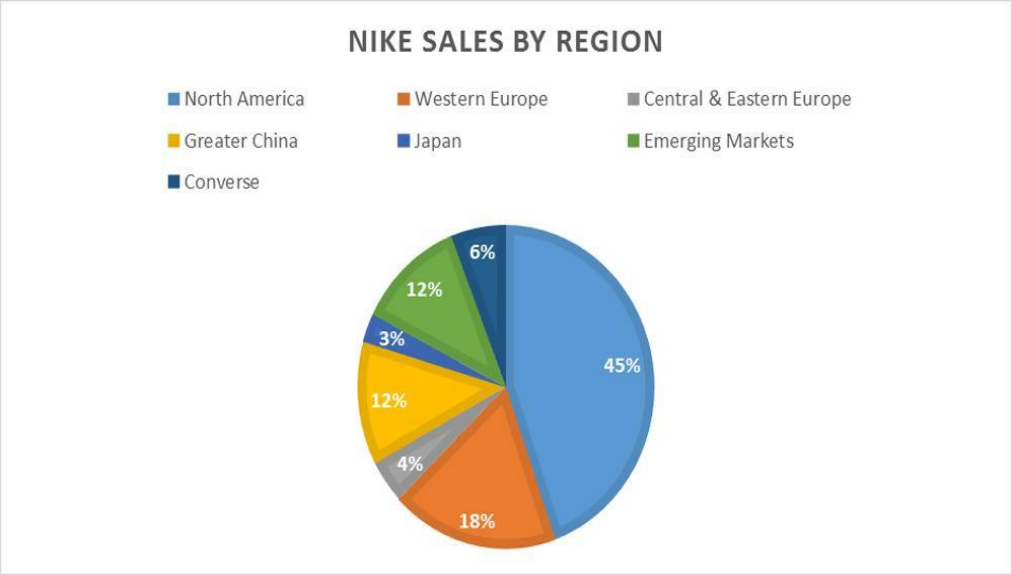
- **Athlete innovation**: Adidas focuses to produce the best and innovative products for the athletes since they form the target group. They work very closely with the athletes, universities and companies to cater to their need.
- **Manufacturing innovation**: They also focussed on innovating the manufacturing technologies. They aim at simplifying the manufacturing processes and focuses on product innovation and quicken the delivery processes.
- **Digital & experience innovation**: Adidas continuously invests in technology over the past.
- **Sustainability innovation:** Adidas has set themselves a target for 2020. They invest in materials, processes and innovative machinery in a way to upcycle materials into products and reduce waste.
- **Female athlete**: Adidas focuses on developing innovative products for the female athletes.

2.4 CUSTOMISATION

Adidas speed factory uses data driven production to minimize waste, remove glue completely from the shoe making process and improves energy efficiency. Through this process of manufacturing the consumer is involved from design to finish by sharing the process visually with the consumers.

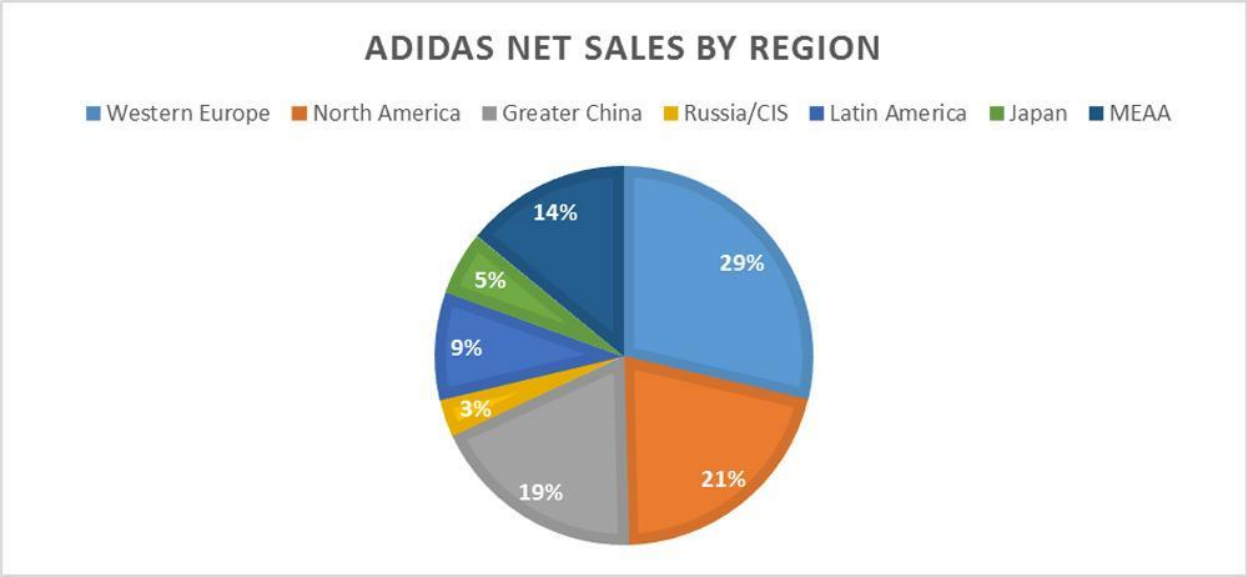
Fashion trends change on a continuous basis. A new market called athleisure has emerged in all major cities. Morgan Stanley forecasts athleisure market sales will touch $355 billion by 2021. Adidas has partnered with Kanye West to develop and market athleisure brand Yeezy. Speed factory ensures customisation with speed.

Figure :2.4.1 NIKE sales by Region.



(Source: www.Grandview research, April 2018)

Figure :2.4.2 NIKE sales by Region.



(Source: www.Grandview research, April 2018)

Nike & Adidas products are sold all over the world. The biggest markets for the brands include North America, Western Europe and Greater China whereas Nike's major market being North America and Adidas dominated the Western Europe. The value of Global athletic footwear market size is USD 64.30 billion in 2017.It is expected to grow at a CAGR of 5% from 2018 to 2025.

TABLE: 2.1 REVENUE COMPARISON ADIDAS VS NIKE

Adidas (euro, billions)	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Revenue	10.8	10.4	12	13.3	14.9	14.2	14.5	16.9	18.5	21.2
Gross margin	48.7%	45.4%	47.8%	47.5%	47.7%	49.3%	47.6%	48.3%	49.2%	50.4%
Nike (USD, billions)	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Revenue	18.6	18.5	18.3	20.1	23.3	25.3	27.8	30.6	32.4	34.4
Gross margin	45%	44.9%	46.4%	45.7%	43.5%	43.6%	44.8%	46%	46.2%	44.6%

(Source: *The NPD Group/ Retail Tracking Service, February-April 2018*)

CONCLUSION

Industry 4.0 commonly referred to as fourth Industrial Revolution is creating a compelling transition in the Manufacturing sector by digitization. It offers great opportunity for manufactures to collect tremendous data which can in turn help them to optimise operations and take actions wherever required. In this case, Speed factory ensures the products are designed and delivered to the customers with speed that would be difficult for competitors to emulate. Adidas superstar sneaker topped the list in 2016 and it was the first time in the decade Adidas could beat its market leader Nike. Lifestyle shoes were preferred over performance sneakers in the US market and Adidas primarily dominated this market. While the Industry 4.0 is still evolving we can expect lots of surprises from this innovative company in the coming years.

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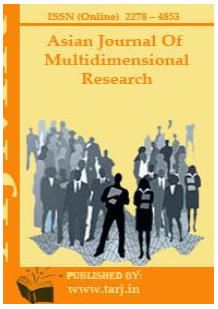

Asian Journal of Multidimensional Research (AJMR)

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UGC APPROVED JOURNAL

TRANS Asian Research Journals

IMPACT OF INDUSTRY 4.0 ON SUPPLY CHAIN MANAGEMENT

Mr. V. Harish*; Mr. M. Vishnukumar; Ms. M. Deexita*****

*Assistant Professor,
PSG Institute of Management,
Coimbatore, Tamil Nadu, INDIA

**First Year PGDM,
PSG Institute of Management,
Coimbatore, Tamil Nadu, INDIA

***First Year PGDM,
PSG Institute of Management,
Coimbatore, Tamil Nadu, INDIA

ABSTRACT

The fourth industrial Revolution commonly known as Industry 4.0 is a transformation of industrial manufacturing process through the confluence of disruptive digital technologies. It creates intelligent networks – connecting machines, work and systems – that can autonomously exchange information, trigger actions and control each other independently through cyber-physical systems. The future of Industry 4.0 manufacturing vision consists of four important aspects namely factory, business, products and customers. In order to establish effective and efficient interface between the four components, Industry 4.0 necessitates innovative Supply Chain Operations Reference (SCOR) framework for its operation. SCOR is based on three major principles: process modeling or re-engineering, measuring performance, and best practices. This paper presents the current trend and future scope which includes Smart industrial production, smart transport, robotics, IoT, and other advanced developments in the supply chain process. It aims to study the impact of the various technologies that are commonly associated with Industry 4.0 to the SCOR model which consists of Plan, Source, Make and deliver. Strategic planning which is an important tool for manager includes construction of a Cyber Physical System (CPS) network, discussion of themes related to smart factory and intelligent production, achieving integrations (horizontal integration, vertical integration and end-to-end integration) and achieving plans which consist of the formulation of system standardization, efficient management etc. The reflection about the major requirements and challenges enabling organizations to be efficient, and operational are discussed from the start to the end of a traditional management phase

KEYWORDS: *Supply Chain Operations Reference, Industry 4.0, Transformation.*

INTRODUCTION

INDUSTRY 4.0

Industry 4.0 is a new era in Automation in manufacturing (H., 2016). It has both expanded the possibilities in organization and also in the process of digital transformation. It combines and connects both the physical and digital technologies (SaurabhVaidya, 2018). Industries 4.0 empowers owners of business to better control and understand every aspect of their business operation, which allows them to leverage instant data to boost productivity, improve processes, and to drive growth.

Industry 4.0 has a deep root in manufacturing industry. Many previous surveys on manufacturing, power, oil and gas, and mining companies which also examined how and where companies are investing or planning to invest in digital transformation (SaurabhVaidya, 2018).

While digital transformation is finally taking shape in almost every organization, paradoxes can be observed around strategy, supply chain transformation, talent readiness, and drivers for investment. Among those digital transformation remains strong, but organizations on the other hand are still finding a path which will balances current operations with the other growing opportunities afforded by Industry 4.0 technologies.

As per the supply chain paradox (Y.Zhong, 2017), previous researches has led to a conclusion that the supply chain is a top area for both current and prospective digital transformation investments, indicating that supply chain initiatives are a top priority. But, people who direct the actual day-to-day business operations—i.e., the people who have "touch and feel" involvement with the implementation of digital technologies—were not on the same table of implementing digital technologies.

SUPPLY CHAIN OPERATIONS REFERENCE

Supply Chain Operations Reference (SCOR) model provides an exclusive framework for strategic decision making in supply chain. It links the performance metrics, people, processes and best practices into a well-defined structure. This framework supports the communication between supply chain partners which in turn enhances the effectiveness of not only supply chain management but also technology related supply chain improvement activities. SCOR model continues to evolve day by day with the inputs from global industrial leaders who manage the supply chain in their day to day activities. There are several benefits of using SCOR model in supply chain model (Huang, 2017). The SCOR-model has been developed to describe the business activities associated with all phases of satisfying a customer's demand.

Benefits of SCOR

Efficient redesign of supply chain network and systematic performance analysis of supply chain management are the major benefits (Deloitte, 2017). It helps in customer services improvement, cost control, supplier partnership, risk management etc (Georgise, 2012).

The scope of SCOR model includes the following segments:

- Customer Interactions: The entire process of the customer relationship, from order entry through paid invoice.

- Product Transactions: All products, from the supplier's supplier to the customer's customer, including equipment, supplies, bulk products, etc.
- Market Interactions: From the understanding of demand, to the fulfillment of every order.

PLAN

It incorporates all the planning activities which are associated with operating a supply chain of an organization. It includes resource planning, raw material planning, cost planning, and balancing requirements and resources to determine planned capabilities and resource gaps. Also the gap or other misattributes has to be identified and corrective actions to be taken for the minimizing the gap.

SOURCE

Scheduling for the receipt of goods and services which are not inbound comes under soucing. It includes Placing an order, scheduling the delivery, delivery, shipment, validation and storage of the received goods and services. Also payment for the sourced goods and services comes under this. The products that are sourced are normally the products that are not the part of company's core portfolio, their production in the organization itself will not add any value to the organization.

MAKE

Make refers to all the inbound activities which are made in the organization (factory) utilizing the skills and resources in the organization. Sourced goods and services may be utilized for making a valued goods or services. These products which are produced in the organization are core part of manufacturing which adds the value to an organization.

DELIVER

It involves in delivering the completed goods to the end customer. This phase starts when the customer places an order which is followed by scheduling the order, preparing invoice and order validation, delivering and finally customer acceptance. Delivery in today's industrial space plays an important role that it has a direct and first impact on customer satisfaction, as people today tend to have everything at a fast instant

RETURN

Return is the reverse process of delivery, were the goods are sent back to the Industry from the customer. This process includes the decision making by the customer if the return the goods if they are not satisfied with the performance of the goods or defects or alter in manufacturing process is needed.

EXISTING SUPPLY CHAIN MODEL

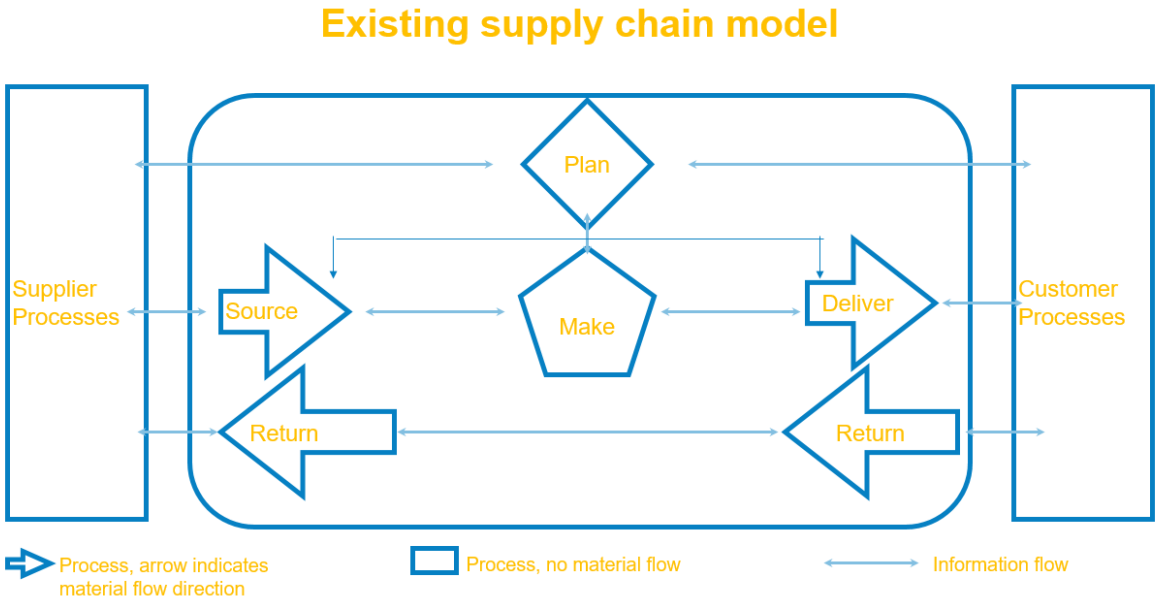

Chart 1

DIGITAL SUPPLY CHAIN CONCEPTUAL MODEL

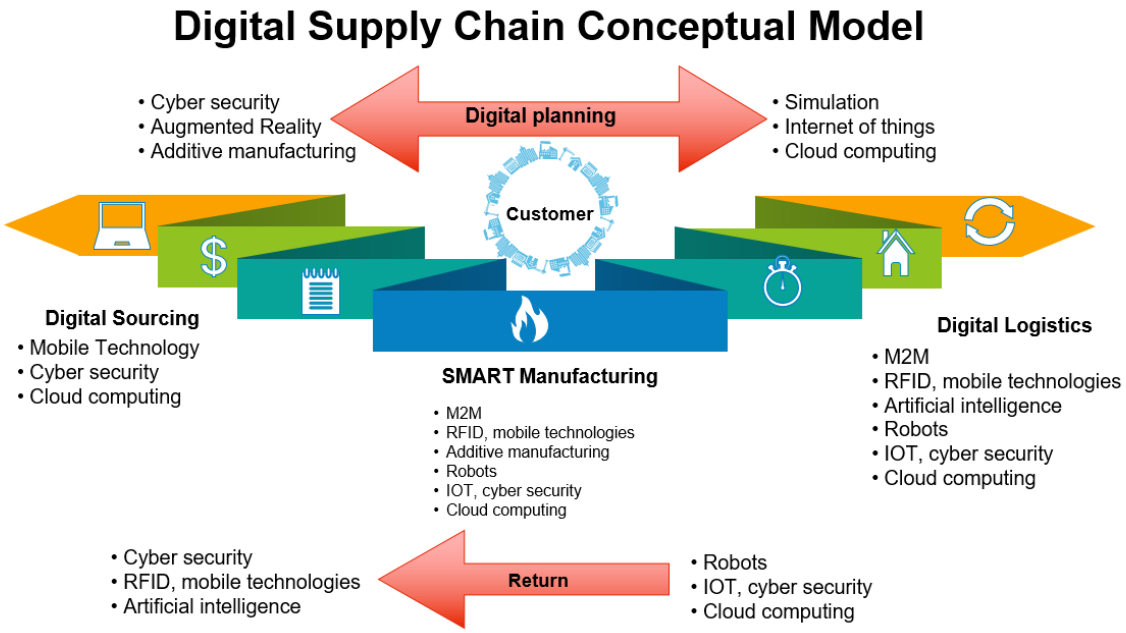

Chart 2

3D PRINTING

3D Printing which is also known as additive manufacturing process that can reduce the energy use by 50% and material and manufacturing cost reduction by 90% compared to traditional

manufacturing process (Almada-Lobo, 2015). Three-dimensional designs are created using specific software applications, digital data can be sent to a 3D printer. The output is a three-dimensional object, which is printed in sequential layers using different materials. Due to its simplicity and high level of accuracy people tend to innovate new products, reduce cost or material wastage by having a specimen copy and many more.

3D printing will potentially have a greater impact on the world over the next 20 years than all of the innovations from the industrial revolution combined. The predicted growth rate is 300% is between 2012-20. Companies and manufacturing industries use 3D Printing technology in Planning phase and Making phase of SCOR model (Wan, 2015).

CLOUD COMPUTING

The National Institute of Standards and Technology in the United States defines cloud computing as a model for enabling ubiquitous, convenient, on- demand network access to a shared pool of configurable computing resources that can be rapidly supplied and released with minimal management effort or service- provider interaction (Wu, 2016). The cloud offers transformative opportunities for organizations.

There are many advantages that cloud computing offers like

- Reduction in time (Implementation cycle)
- Reduces the capital investment
- Offers scalability
- Room for innovation

With several advantages it has a risk factor in it also

1.Anticipated cost savings don't materialize

2.Vendor lock‐in

3.Data security and privacy

4.Compliance and regulatory risks

5.Hybrid cloud integration

Companies like **Matson Inc** have moved completely to the cloud environment where they were able to gain the unsalted heights. Now a day's company uses the cloud in storing data as it is cheap and also the one which save time in competitive world. Also having skilled workforce for doing the same is not needed.

CYBER-SECURITY

Industry 4.0 has an interconnected structure that connects both the physical as well as the technological aspects. This interconnection in manufacturing, storing data or formulating hypothesis, planning etc. brings in the risk of cyber-attacks (Duncan). To address these cyber-attacks or risks there should be secure, vigilant, and resilient cyber security strategy which should be fully integrated into the organization.

Digital Supply Network is one which is capable of capturing information from various points in a supply chain. This DSN helps to improve the performance of the supply chain. But the increased number of interconnection in DSN brings in the cyber weakness which opens the root for cyber-attacks (Thames, 2017).

Cyber-attacks are mostly done with the motive of getting money, stealing important data from primary sources, and for black mile purpose. This not only ruin the supply chain or organizations health it becomes a threat to national security. The most resent notable cyber-attack is by *ransomware* in India and some Asian countries (KPMG, 2017).

IOT

Internet of Things a resent technological phenomenon that changes the way the day to day business look. It is dependent on connectivity between air, water and land. Robotics and drones, therefore, are essential building blocks of an IoT ecosystem, in many ways (JayavardhanaGubbi, 2013). It is a system of inter connected computing devices, mechanical and digital machines, objects or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.

MACHINE TO MACHINE COMMUNICATION

It is the process of establishing the connection between to machine or device to perform a specific task in repetitive basics. Communication should be in such a way that the machines should be able to make its own decisions at any point of time. This involves mostly in smart factory (Mosterman, 2015).

Business Intelligence provider **Visiongain** offers comprehensive analysis of the global M2M market leaders. Visiongain assesses that the machine to Machine (M2M) market will generate revenues of $38 billion in 2018 (Varghese, 2014). Other M2M communication companies are Aeris, AT&T Inc, Bharti Airtel, China Mobile etc (Deloitte Report, 2016).

MOBILE TECHNOLOGIES

Mobile technology pays the way for Digitally Enabled Businesses

Mobile technologies are well recognized as one of the forces which help to drive Industry 4.0 and then streamline the manufacturing operations in an organization. But, manufacturers face a wide number of hurdles that are impeding mobility deployments and delaying those companies who want to harness the power of new technologies that hold the promise of the smart factory (Shrouf, 2014). Manufacturers see the implementation of mobile technology as promising because they view many other sectors already benefitting from the tangible improvements. They recognize opportunities for improvement across all areas of the plant, from the shop floor to the warehouse to management (Wan, Mobile Services for Customization Manufacturing Systems: An Example of Industry 4.0, 2016).

With the implementation of 5G there will be faster, more reliable telecommunications that would benefit the business (KPMG, 2017).

RFID

Retail industries face many challenges which include predicting what marketing campaigns will be effective, understanding customer behaviour and tracking customer satisfaction. The solution or the

above revolves around a customer UI mobile app as well as a store employee UI app which interacts with sensors like beacons and RFIDs (Want, 2006).

INDITEX

Inditex with RFID isn't focused on retail item tracking, but instead on the supply chain management from store to store. Stores under the Inditex brand like Zara, Pull & Bear, and Massimo Dutti started rolling out RFID in its stores in July of 2014 (RFID and its Effect on Supply Chain Management, 2015). Because millions of items ship between stores and to stores from warehouses, they are using this technology to give their logistic centers' visibility through the shipping process. This way, they are hoping to reduce mistakes currently being made in shipping, packing, and customer service.

ROBOTS

Robots are used in the supply chain to speed and accuracy of routine operations, particularly which are in warehousing and manufacturing space, work side-by-side with humans for adding efficiency which also reduces the risk of employee injuries in dangerous and hazardous environments (Sabine, 2016).

Also the level of complexity the job that a robot does has been increased with the increase in software, sensors and more importantly with the introduction AI (Artificial Intelligence), as these robots are programmed to perform tasks with little to no human intervention or interaction (Sandesh, 2018).

Amazon.in uses these types of advanced robots for the repetitive work in its warehouses to improve the speed and effectiveness.

BLOCK-CHAIN

Block-chain as a concept has been around for nearly a decade. It is a well understood and defined concept that forms the backbone of the most used crypto currency. Block-chain, as a technology, focuses on integrity and immutability of transactions (Melanie, 2015).

Block-chains can be used to ensure the most important things like data integrity and security, which are seen in many projects like Autonomy which focuses on a security protocol, IBM Watson IoT integrated with block-chains and start-ups like IOTA that aim to be an underlying technology for IoT applications (Business, 2017).

ARTIFICIAL INTELLIGENCE

Artificial Intelligence (AI) is a big field, and this is a big book. We have tried to explore the full breadth of the field, which encompasses logic, probability, and continuous mathematics; perception, reasoning, learning, and action; and everything from microelectronic devices to robotic planetary explorers (Russell, 2016). AI applications are based on various things that neural networks, machine learning, deep learning and various algorithms.

In this Machines are made to act like humans after they are trained well to accomplish a specific task by processing a vast variety of huge data and identifying patterns in those data.

This growing interest, value proposition of the technology is resulting all IT companiesto incorporate AI in their day to day activities.

Some of the major developments in the field of AI have been taken by Google, Apple, Amazon and others (Deloitte Report, 2016). Government of India has appreciated the immense potential of AI and has made significant investments to use it for better governance and service delivery

INDUSTRY 4.0 MIND MAP

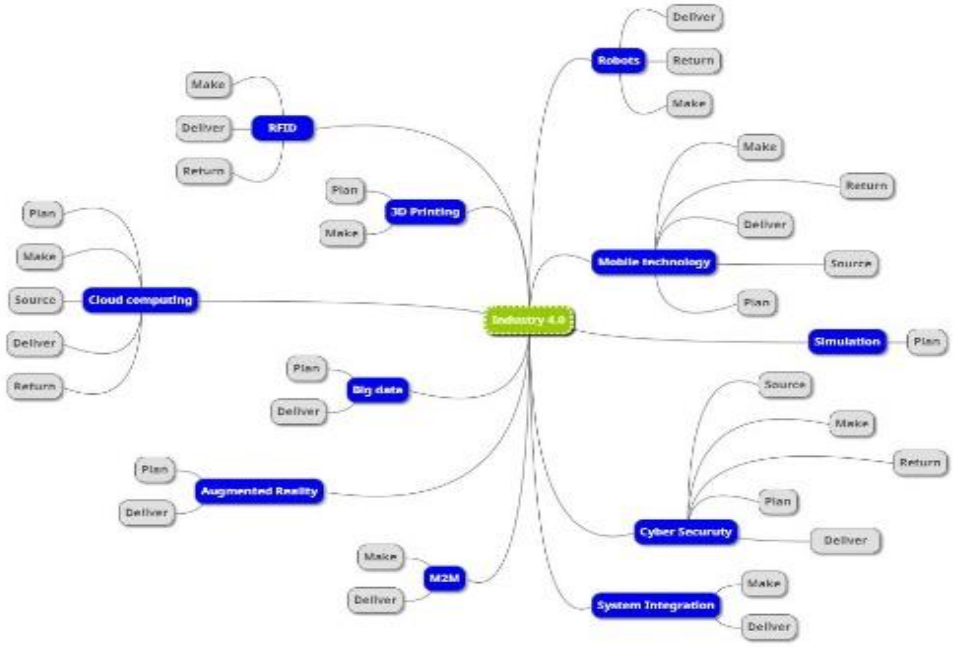

Chart 3

CONCLUSION

The existing SCOR model in supply chain management is less compatible as a system for future industry requirements. The increasing demand for automation and advancements in various technologies facilitates the need for a customized SCOR model specific to industry and customer needs. An efficient SCOR model will help to reduce the complexity of human processing in many process and services. Thus it is necessary for the business environments to exhibit readiness for Industry 4.0 technologies and develop a tailor-made SCOR model to suit their application.

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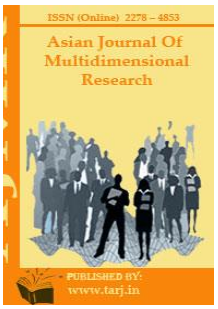

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UGC APPROVED JOURNAL

IMPACT OF INDUSTRY 4.0 TECHNOLOGY IN SERVICE SECTOR

Dr. M.K.M. Manikandan*; Ms. Rajalakshmi**

*Assistant Professor,
DJ Academy for Managerial Excellence,
Coimbatore, Tamil Nadu, INDIA

**Student- II MBA,
DJ Academy for Managerial Excellence,
Coimbatore, Tamil Nadu, INDIA

ABSTRACT

Services being intangible will be unique as its production and consumption happens at the same instance. In today's connected world, there are new services every two years that makes huge impact in the economy and the job market. These are invariably internet based technology services. Industry 4.0 is going to make huge impact in all the industries that implements the technology. Industry 4.0 includes four broad concepts like cyber-physical system, Internet of Things, Cloud Computing and Cognitive Computing. Cyber physical system is about computer algorithms that are linked with the physical objects, Internet of Things is about connecting objects that were not connected with internet earlier. Cloud Computing is a well-known technology, where data is stored in a remote storage device or software is used on a rental basis. Cognitive Computing is about the creation of system where the machine can take decisions. All these four components of Industry 4.0 will have a big impact on the lives of common people. One of the recent application of Industry 4.0 is the connected cars where the car will communicate with the server which will throw open lot of new opportunities in the service industry related to the automobile sector. Extending this to other industry like hospitals, home care industry, retailing, logistics and so many others will have a huge impact on the way the service operations are performed. There will be avenues for newer opportunities and at the same time some business process would undergo complete transformation if not disrupted. This conceptual paper will attempt to conceptualize the possible impact the Industry 4.0 have on the booming service sector.

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KEYWORDS: *Industry 4.0, Service Sector, Retailing, Internet of Things, Cognitive Computing*

INTRODUCTION

Industry 4.0 is all about interconnected world. This will create abundant amount of data that will be available for analysis .Industry 4.0 denotes the interconnection of cyber-physical system, internet of things and Internet of system leading to decision making at the machine level itself. According to McKinsey report dated November 2018, the connected devices are expected to get doubled between the period 2017 and 2020. As we get new data sources, this will lead to innovation of new business model in products, services.

Service Sector deals with people as well as things that are owned by people. It may be too early to talk about industry 4.0 in service sector when people involved in the area are dealing with the inter connected machines, the application of internet of things or the concept of industry 4.0 in service sector is not far away.

Services sector denotes acts or performance that does not result in ownership. One of the important characteristics of Services is that the product that is purchased is in-tangible. Hence services can only be experienced and cannot be touched or felt with physical dimensions. It will be interesting to note that given these characteristics, application of Industry 4.0 in service sector is a long dream. But in reality, the concept and the technological advancements in internet of things leads to better service experience to customer. Few of the applications of Industry 4.0 in services sector would be the Connected Cars and Fitness wearable.

In the case of connected cars, the car is connected with other devices through internet and there will be exchange of data between the car and the connected devices. There are so many applications of Connected Car concept. The vehicle can be tracked, it can be judged on the driving condition, the wear and tear of the vehicle can be captured in real time. The possible benefit to the car owners is that he can have a tab on the details about the car and the insurance companies involved in car insurance can study the history of the car about the behaviour of the driver of the car and the durability of the car.

The next example of application of internet of things is the fitness wearable. The wearable that are worn on the arms or body parts, are connected to the smart phones and can track the details of the person's health related details. Based on these details, restaurants can offer special menu to the people concerned and so on.

Swiggy and other online food ordering apps captures the habit of food consumption of each household and will be able to understand the food consumption of people. This will be used in many ways to provide offers to the customers. Similarly, the ride sharing apps Ola and Uber captures the ride habits of customers. With the use of big data analytics, the consumers' behaviour can be understood.

Services sector started using machine to offer service to customers. Especially, restaurants and sweet brands like Krishna Sweets using Automated Vending machine where the customer himself/ herself carry on the dispensing process of the food items reducing the need for the human intervention.

LOGISTICS AND SUPPLY CHAIN SECTOR

The logistics and Supply Chain sector will be greatly benefitted with the Industry 4.0. The benefit ranges right from seamless communication among the stakeholders through social media, use of cloud computing technology, mobile application, automation in warehouse sector, and implementation of automation in organization. All these changes lead to the betterment of the logistics sector and huge impact will happen in the way goods are getting transported. Logistics being a service will undergo huge transformation with the implementation of Industry 4.0 concept. There will be reduction in cycle time in the transfer of goods from one place to other as the information is shared seamlessly across the participants leading to huge drop in the cost of the service. It was expected that automation in warehouse operation leads to reduction in the cost of sorting, picking and storing cost by 30 per cent, a huge value when the actual cost of these accounts for 40 per cent and above.

HEALTHCARE SECTOR

Application is Interconnected devices in healthcare sector is still at a nascent stage. There will be lot of application of interconnected devices in healthcare sector. As per Electronic Health Reporter (2018), prolonged hospital assistance to patients can now be made available in the house of the patient as the patient can be monitored by attaching the devices to the patient and monitored from remote places. Similarly, the physician need not visit the hospital for the consultation to the patient. The consultation can happen from the place of the physician. Moreover, the documentation of the patient history is very important for future reference of the patient. Voice recognition software provides an opportunity to record the conversation between the doctor and the patient and convert it into data through AI. The medical coding business will have a difficult time when this technology takes over the data creation in the healthcare sector.

PRECISION MEDICINE

McKinsey Report (2019) titled Precision Medicine: Opening the aperture, states that personalized medication, popularly called as precision medicine is possible with the development of Industry 4.0. The concept of right drug for the right patient at the right time is possible through this.

This is done through three concepts. First, by data collection from various diagnostic devices that is either connected to the patient or from the testing centers, the second from analytics tools and third from modified business models to cater to the changing technology. Two individualized therapies were approved in the US in the year 2017 and 2018; they are Yescarta and Kymriah for the treatment of Leukemia and Lymphoma.

INFORMATION TECHNOLOGY SERVICE IN BANKING SERVICES

India is witnessing amazing changes in the Indian banking sector as a part of the financial sector reforms. Prior to economic liberalization, Indian public sector banks have enjoyed a protected market in the banking industry. But after economic liberalization, Indian banks are exposed to free market competition. Consequently, customers‟ retention becoming crucial is strategic need. Today, growing competition in banking market is not highly stressed profits oriented banking, it has moved towards customer centric and mass banking. Competition has forces to go for a new marketing policy in banking sector. They have introduced a new strategy of customer centricity in banking for the customer satisfaction and the retention. It has become very important for the banks to retain at least their existing customer and think for enlarging the same. It is not only problem of public sector banks in India but also a problem of private sector banks because many foreign banks and financial

institutions are aggressively acquiring Indian banking market. Therefore, Indian banks should try to satisfy their all types of customers by providing good quality services.

TRANSFORMATION OF PERSON BASED TO TECHNOLOGY BASED SERVICE

Earlier the service is delivered mostly by the person concerned and there was no detail about the customer on what he is looking for from the service provider. Technological breakthrough provides us the opportunity on how a customer uses the products and what are the needs for the customer. This leads to more self-services and automated services.

The advent of RFID paves the way for automatic checkouts at retail stores. Interconnected customers can share the details on the usage of products. Virtual assistant like Alexa, Google Assistant or Cortona of Microsoft paves way for the automatic ordering of the services or products without the customer involvement. Chatbots are one of the finest inventions that track the customers and suggest the possible service need of customer even when the customer is not aware on the need. Such advancement of need tapping leads to instant delivery of the product leading to massive change in the way services are offered to the customers. This leads to newer services that can differentiate from other services. The increased delivery of services leads to decrease in the cost of service which again is a positive development for service providers.

CONNECTED SERVICES

Today's technology allows one to reach to any corner of the world to offer their services. An individual sitting in Coimbatore can provide ideas to a farmer in Brazil on the management of disease in coconut tree. Virtually the boundary of business operations has been nullified with the advent of technology and many new businesses were adapting to the new world of connected people. Digital services coupled with digital money paves way for enhanced service operations across the globe.

INCREASE IN NON-PERSONAL INTERACTION

The increase in the quantum of data of the consumers leads to a situation where customer's interaction with the service provider is limited. As more details about the customers are available to the service provider, the need of the customer is identified and necessity of customer contacting the service provider is less. But there is another perspective to this view. Other school of thinking relates this to a situation where need for human interaction will greatly become another set of service. For example, the counseling sessions, laughter clubs will find more relevance to people due to the lack in the human interaction.

ROLE OF TECHNOLOGY IN MARKETING SERVICES (Quinn et al, 1987)

1. New Services becomes easier: Interconnectedness leads to newer emergence of services. These services are easier to avail. For example, insurance policies were renewed as the artificial intelligence tracks the expiry of policy and reminds customers for renewal.

2. Today many private insurance companies allow their customers to buy insurance policies through websites removing the need for insurance agent.

3. Latest technology allows companies to have close link with customers by linking the details of customers in the client information system.

4. Technology allows companies to provide the details to the customers without delay, by providing immediate access to information on their services. This leads to better service to customers. The employees of service providers could customize according to the requirement of customers.

5. Automation leads to reduction in the cost of service

NEWER TRENDS IN IT SERVICES

Chat bots- Customer services are done online through Artificial Intelligence software by way of Chat bots. Customers get a feel of getting the response from a human being while in reality; artificial intelligence will be providing the details required by the customer based on the past consumption. The advantage with chat bots is that they can deal with more number of customers simultaneously and emotional outburst can be handled effectively by chat bots leading to better service recovery.

Cloud based services will play a vital role in sharing complex, premium software to many individual customers by way of sharing through cloud. For example, by sharing films and songs through cloud applications, telecom service providers can earn huge profit by charging little from customers. Today telecom providers are no more communication companies; they are expected to carry content of television, cinema, magazines, and songs and so on.

Augmented Reality (AR)– The use of AR in the service industry remains limited. One of the applications of AR is the use of camera on a smartphone or tablet to scan an image, barcode or QR-code. The AR software will recognize this image and overlay information on the display, augmenting the real-live image with information from a database.

Similarly **Virtual reality** offer huge potential of replacing human intervention in offering the service. Recently there were surgeries conducted by doctors for a remote patient through a robotic surgeon performing the task of surgery. One possible impediment for both AR and VR is the speed of data and bandwidth. This deficiency will be addressed with another new technology of data transfer called as 5G telecom services that allows for speedier data transmission.

Internet of Things (IoT) allows one to facilitate real time remote monitoring. This real time sharing of data reduces the cost of data collection and saves time and money and enables quick and quality decision making.

PREDICTIVE MAINTENANCE OF GOODS

Interconnected devices can make it easier for marketers to create customized services and build the relationship with the customers. Manufacturers would be able to understand how customers use these goods and would be able to predict their revenue from the after sale service from each of the customers leading to better customer management. This will also lead to the field sales force management and streamlining of costs.

CONCLUSION

The technological development has tremendous impact on the way the businesses are been conducted. Every time a new technology develops some newer form of service industry flourishes. Industry 4.0 is an emerging area where the impact of the technology was not known directly by the people involved in the technology. The new service can have spiraling impact on economy as many supporting services will be developed around the main services. This will lead to overall economic development but the challenge would be to educate the customers and the workforce to adapt to the new technology based services. Like any other technology, the adoption of Industry 4.0 will take some time especially in India.

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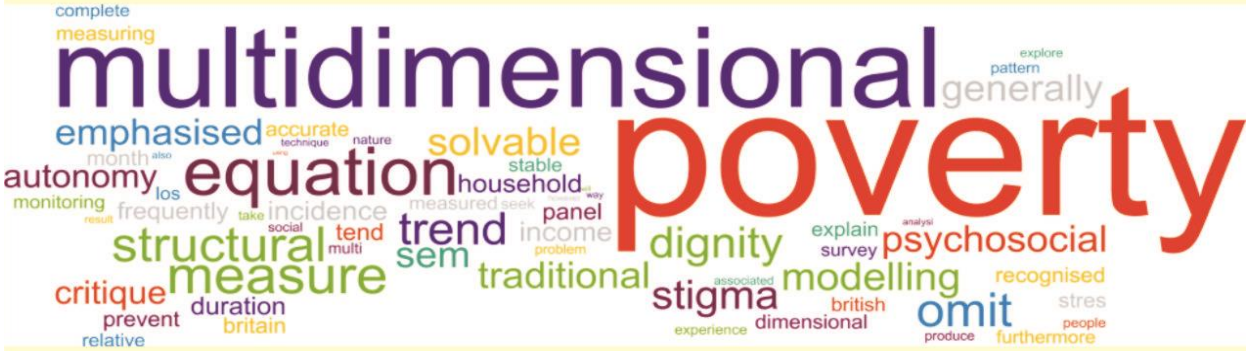

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