INDUSTRY 4.0 IMPACT ON INDIAN INDUSTRIAL WORKFORCE

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ABSTRACT

Industry 4.0 all over the world is emerging as a mighty force and it is proclaimed as next industrial revolution. In recent years adapting the technology is motivating the HRM role. But in India the growth of Indian industries is not performing according to industry 4.0. The workforce of India is very large but the lack of skilled workforce is impacting on the productivity of Indian Industries.
The objective of this article is to identify the impact of I4.0 on Indian Industrial Workforce. This goal will be achieved by (1) a literature review, (2) Recapitulate the current state of knowledge and providing clarity of further work. Scopus, Web of Science, and a set of keywords were used to select peer-reviewed articles showing of the impact of I4.0 on workforce in specified countries or industries.

Keywords: Industry 4.0, Workforce, HRM, Indian Industries.

INTRODUCTION

The concept of the Industry 4.0 can be described as an increase in the amount of digitization throughout the entire value chain, and a possible structuring of data transfer between people, objects, and systems in real time. The Fourth Industrial Period emerged when the machines used in production started to manage themselves and production processes without the need for human power. This structure, which is referred to by the concept of "the Internet of objects", extends to the self-management of the manufacturing factory. The Fourth Industrial Revolution was first spoken at the Hannover Fair in 2011 their own organizations' most valuable assets, or human capital. In 2013, the "Industry 4.0 Platform" (www.plattform-i40.de) was put into practice to prevent the Industry 4.0 from being just one theory and to take action.

This platform is primarily aimed at supporting the development of new technologies, defining the basic standards for the Industry 4.0 vision, identifying new business models, and conducting community awareness activities (Siemens 2016).Over time, the concept of Industry 4.0 has become the focus of all countries that have developed beyond Germany to design a new industrial system. India lags behind its global peers in Industry 4.0 adoption. A significant portion of the Indian manufacturing sector is still in the nascent stages of adopting Automation on its shop floors. The integration of physical systems on cyber platforms, the basic premise of Industry 4.0, is still at its infancy. Furthermore, the MSME segment has very little access to automation technology due to the high-cost barrier. The Government of India has set a target of increasing the contribution of manufacturing output to 25 percent of GDP by 2025, from about 17 percent currently. Adopting Industry

4.0 will be crucial to be able to achieve this. The Government of India launched the SAMARTH (Smart Advanced Manufacturing and Rapid Transformation Hub) - Udyog Bharat

4.0, an Industry 4.0 initiative, under the ambit of the Department of Heavy Industry & Public Enterprise. SAMARTH aims to raise awareness about Industry 4.0 among the Indian manufacturing industry through demonstration centers. SAMARTH aims to bridge the quality gap between Indian products and their foreign counterparts and help MSME's to adopt new technologies to enable quality exports. SAMARTH Udyog encompasses a consortium of manufacturers, vendors, and customers as the main stakeholders. Some of the other initiatives taken by the Government of India include the National Program on Artificial Intelligence with NITI Aayog and the Mission on Cyber-Physical Systems. Currently manufacturing industries have switched to customized production from mass production. Due to advancement in manufacturing technologies productivity and qualitative engagement increased across product and services. "Industry 4.0" describes the new models of smart organization spread over the full value chain. Few concepts which form the core of "Industry 4.0" dream include IOT, Industrial Internet, and Artificial Intelligence etc. For a vision to translate into action and reality it is critical that we understand the concept, its requirements and also see the current level of preparedness of industry by the owners and employees too, to convert the vision into reality.

Research Questions

The research questions for this study encompass a descriptive format as defined by the constructs of a qualitative research study. The research questions were used to discover How Indian workforce can be made capable and skilled for adapting advance technology under Industrial revolution 4.0
C. Analysis of needs naturally leads to the planning of programs, which will fulfill the needs in a timely manner. Three basic areas, which we have discussed previously, are:
Prioritize the initiatives taken by the Govt of India for the industrial revolution 4.0
Improvement in the Policies in SAMARTH (Smart Advanced Manufacturing and Rapid Transformation Hub) by Govt of India
Improvement in making workforce skilled availability of advance technology courses
Walker contends that by focusing on these areas, a link can be Established between the broad range of external and organizational factors and specific personnel programs.
His planning process defines human resource needs and then defines a strategy to satisfy the needs. This then becomes a dynamic process, which insures that programs, which do not satisfy identified needs, are dropped in favor of specific programs pertinent to current or forecasted needs.

LITERATURE REVIEW

Ulrich & Brockbank, There are various roles HR professionals has to perform, namely, employee advocate, human capital developer, functional expert, strategic partner and leader.
Bakuwa, 2013; Mamman, Rees, Bakuwa, Branine, & Kamoche,The role of HR professionals as employee advocates involves addressing the current needs of employees by listening and empathizing with them The employee advocacy role requires HR professionals to serve the interests of employees, as well as execute other roles towards stakeholders of the business that recruited the employee
De Ruyter, Brown, & Burgess, Rizvi, This role can be used to mitigate the negative effects of anxiety and career doubt, which is vital in industry 4.0 as the introduction of new of technology results in job collapse, deskilling, job insecurity and increasing inequities.

De Ruyter et al ; Sharma Human resource professionals as employee advocates need to engage with employees, establish personal career objectives for them and formulate a plan of action to achieve these objectives. Mamman & Kulaiby, The human capital developer role entails the management and development of employees to meet future needs of the organization Bakuwa,The role of HR professionals as human capital developers involves overseeing and advancing HR collectively or individually, with the objective of equipping employees to thrive in the future. De Ruyter et al.Industry 4.0 brings about new technological advancements and job opportunities, and employees will therefore have to update their competencies as demanded by this new industry Özüdoğru, Ergün, Ammari, & Görener. As such, employees will have to be retrained to accommodate this transformation. Bakuwa, The functional expert (previously known as administrative expert) role is associated with the human capital practices that are key to the HR value Sharma,This role requires HR professionals to develop HR systems and arrange for HR development (HRD) audits to keep abreast of how HRD systems are functioning in the organization. Human resource professionals as functional experts contribute towards giving their organization a competitive edge in terms of their human capital by selecting and hiring the best candidates.The strategic partner role of HR professionals comprises of dimensions such as consultant, business expert, knowledge manager, change agent and strategic HR planner who facilitate the HR systems to achieve the organizational goals. The strategic partner role requires HR professionals to identify the main areas requiring attention with regard to people and technology Al Mamun, Shamima, & Islam,Strategic HR activities help boost the productivity of employees, and future productivity results should indicate how employees use technological innovations In the age of digitisation it is vital for HR professionals to become change agents; they need to assess the current state of the organization, deal with employees' resistance to change and provide employees with the necessary competencies to deal with changes DiRomualdo, El-Khoury, & Girimonte, Human resource should start by preparing the changes they will need to meet the needs of organizational digital transformation Bakuwa, Mamman & Kulaiby,Sheehan et al. In a leadership role, HR professionals are required to act as credible leaders and partner with other leaders to set and improve the level of strategic thinking The leader role relates to the credible activist competency of HR professionals, which requires them to be self-aware and dedicated to developing their profession Ahmed & akhtar In his study focussed upon examining the effect of HRM practices (i.e. training, personorganization fit, and rewards). on organizational commitment in Jordanian public and private organizations. The training programmes given to employees have positive impact on their level of organizational commitment.

Kumara & Pandey revealed in his studies that there was no significant difference among the turnover, intentions of library working personnel by their place of work states that the job performance of individual's workers may vary with the extent of ambivalence being experienced by them during work time. Lal et al. found that with the change in the scenario of working environment, the ways of performing job roles have undergone a drastic change. It was found that the job satisfaction is related directly to employee turnover/retention rates & absenteeism and indirectly related to job performance and productivity in the industrial setup.

Ray &Ray focussed HRM practices and its impact on job satisfaction in selected iron and steel firm in India. Factors like self-directed work teams, job rotation, recruitment and selection have very little impact on job satisfaction. Chauhan & patel concluded in his studies that recruitment and selection, carrier growth, working conditions have a positive impact on job satisfaction in the hotel industry in Udaipur (India). All the HRM dimensions exercised in the

hotels of Udaipur division do not satisfied the employees equally. Enormous studies are available on the technological changes and its impact of workforce market and jobs. These studies are based on the industrial revolutions and discussion was on destruction of jobs and creation of new variety of jobs, is a continuous process of formation and re-formation of workforce market arrangement (Autor, 2015; Deming, 2017; Goldin & Katz, 2009; Arntz, Gregory & Zierahn, 2016; McKinsey Global Institute, 2017; Spitz-Oener, 2006; World Economic Forum, 2016).

In recent years, the debate on how Industry 4.0 will change the workforce market both I developedl and developing countries including India. Several agencies(Govt. and Non Govt.) and scholars have also conducted several studies on the impact of technologies on Indian job market and on workforce in recent years such as FICCI (2017), NASSCOM (2017), ILO (2018), Chapman and Sonne (2018). These studies claim that India's workforce is largely involved in low-skilled and low-paid informal sector and in formal or organized sectors. Therefore, Industry 4.0 will have less impact on informal sector, while formal or organized sector. Fewer studies also indicated that the acquiring of Industry 4.0 will also benefit informal sector in the form of higher income and better working conditions (Ilavarasan, 2017; Mehta, 2018). However, mostly these studies have covered either selected industries or one particular industry. Hence, this study is an effort to fill the void by exploratory research on the impact of Industry 4.0 on Indian workforce market in a comprehensive way. The World Economic Forum's (2016) report highlighted the direct impact of Industry 4.0 technologies on existing jobs and new ways of work globally—specially on entry level, low-medium skilled jobs (World Economic Forum, 2017). The report suggested that with the exponential technologies on the horizon, the higher-value jobs will be fabricated that would require different set of skills and result in likely job losses in developed as well as developing countries including India.

As per the World Bank report, the proportion of jobs threatened by Industry 4.0 technologies in India is 69 % year-on-year (Business Today, 2017). Further it stated that sectors such as automobiles, IT, financial services, manufacturing, transportation and packaging are in the switching mode and are adopting new technologies for better control which is affecting and reshaping the workforce. Lease Services et.al. study confirms that 52–69 per cent of repetitive and predictive roles in these sectors will be exposed to the risk of Industry 4.0 technologies.

Job Buzz survey states that about 70 per cent of the Indian employees perception is that automation will carry off their jobs and 20 per cent feel that Industry 4.0 technologies will make their jobs better (Ganesh, 2018). 55 % of employees would like to enhance their skills to battle the impact of Industry 4.0. FICCI study pointed out that that there will be decline in lower- and middle-skilled associated jobs and consequent increase in high-end jobs, referred as 'job polarization' (Mehta, 2018). In this Industry 4.0 technologies context, the governments, policymakers, academicians and members of civil society are raising concerns with regard to the future of workforce in India. The debate so far has more focus on developing countries like India. Within this perspective, this article explores the existing workforce market structure and the impact of new technologies on India's workforce with specific focus on structure, skill level, various sectors and challenges.

This article is based on the Report of Fifth Annual Employment– Unemployment Survey (2015–2016).

REVIEW METHODOLOGY

Research approach

This study employed a qualitative research approach. This approach was considered suitable for the study as it provided useful insights into how the industry 4.0 will affect the Indian Workforce.

The extensive literature reviews were carried out from various available databases related to knowledge sharing, knowledge transfer and knowledge flow. For this, the authors referred different papers from the database viz. Web of Science (WoS) and Pro Quest which contains a significant number of renowned publications, like Emerald, Taylor and Francis, Springer, IEEE, and Elsevier. The structured review methodology adopted a five-step process as shown in Figure 1.


Figyre 1
STRUCTURED REVIEW METHODOLOGY

Database Selection: The search strategy was developed by first going through the relevant data sources i.e. Database. To have access to a wide range of academic and conference publications, the Web of Science and ProQuest database was selected. These are one of the most extensive abstract and citation databases, includes thousands of peer-reviewed journals.

Keyword Selection: The most relevant and appropriate articles are cited in this paper. So, the keywords used for the search process are very specific viz. Industry 4.0, Industry 4.0, Workforce, HRM, Indian Industries

Collection of Articles: The initial search results in generating 698 articles published from 2012 onwards. The articles published in different conference proceedings, book chapters, news articles, doctoral thesis and editorial notes were excluded. The articles then dropped down to 134. The year wise distribution of 134 articles is shown in Figure 2.
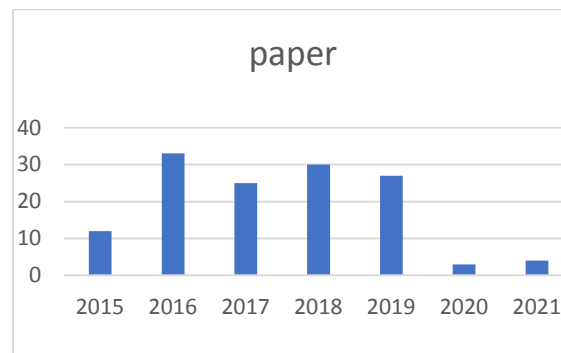
Figure 2
INCLUSION/EXCLUSION CRITERIA

Inclusion/Exclusion Criteria: As the focus of the paper is review the most recent (latest) articles, so the articles published between January 2017 to June 2018 are selected. The articles

from journals:
Journal of Intelligent Manufacturing, Journal of Manufacturing Technology Management, Human Resource Management International Digest, Sustainability, Energies, International Journal of Production Research, Computers and Industrial Engineering, Advance Manufacturing, Computers in Industry, Journal of Industrial and Production Engineering, IEEE Transactions on Industrial Informatics and Process Safety and Environment Protection are selected to have high reliability on the articles.
The number is then dropped to 26 articles which are selected for the study.
Reviewing the Selected articles: The 26 articles where studied and observations were made from them.

CONCLUSION

The world at the entry point of fourth industrial revolution (Industry 4.0). The first industrial revolution in late 18th century was driven by hydro and steam power leading to mechanization. The second by electricity and resulted in mass production through assembly lines and the third industrial revolution led to large scale automation through programmable logic controllers. The fourth (Industry 4.0) is about high speed digital networks, cloud computing, and artificial intelligence. It is about creating new age corporations with cyber physical systems and internet of things (IoT).
India lost out on the first two industrial revolutions due to rule of colonial powers and the third one due to bureaucratic red tape.

Missing industrial revolution 4.0 can be a major catastrophe. With huge availability of IT and engineering graduates, a conducive environment for startups, India is better placed than many countries to be a part of industry 4.0. The physical infrastructure for internet and telecommunication has improved considerably in the last decade. This has been supported by mass scale electrification of urban and rural India. India has the highest penetration of internet-connected smart phones in the world. Added to this, there is a supportive government with business-friendly policies, willing to act as a catalyst. This has led to emergence of world class digital companies such as Flipkart and Myntra in e-commerce, Practo in healthcare, Voonik in women's clothing and Ola in transportation. Many others are evolving to serve the digitally connected global consumer. However, despite huge valuations, most entrepreneurs at the back-end run brick-mortar, slow paced organisations not aligned with technologies of the future.

The Indian entrepreneur needs to understand the architecture of future-ready global corporations. These entities use application programming interfaces (API) to integrate software development with IT operations (DevOps) apart from using AI, cloud computing and IoT. The new corporation shall utilise the potential of augmented, virtual and mixed reality, robotic process automation (RPA), quantum computing and machine learning to find sustainable solutions to the problems of the global economy.

Corporations in developed countries are already using these technologies. This has led to innovations in managing data storage, data security and interrelationships between enterprise data. Focus is also on blockchains, the technology behind the infamous cryptocurrency market. Though cryptocurrencies are illegal in India, the entrepreneurs have been able to implement blockchain technologies in healthcare, education and land registrations.

Rapid integration and alignment of India with Industry 4.0 is visible. Digital entrepreneurs are providing support to both public and private sector. The efficiency of e-governance systems has already improved considerably. Augmented and mixed reality is being used in healthcare and

we are seeing a steady adoption of robotic process automation for supply chain and management of financial control systems.

The new age digital entrepreneur is expected to change the ways of business is conducted in India and the way we live.

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