

## **Industrial Revolution 4.0: Changes in Context of Human Resource Management**

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**Abstract:** 4<sup>th</sup> industrial revolution is very popular concept now days which is also known as Industry 4.0. The industrial revolution includes management of human resource, where managers have to focus mainly on development on technological and innovative skills of employees. The aim of this conceptual/ theory base paper is to check the impact of IR 4.0 on human resource management. Like change in technique of job designing, training and development, challenges faced by employees and skills required to cope up in this technological era.

**Keywords:** Industrial revolution 4.0, human resource management, technology.

**Objective of the study:** the objective of this paper is to study the impact of industrial revolution on human resource.

**Research Methodology:** the study was based on available literature review and online sources.

### **Introduction:**

**1st phase (1780-1830):** end of the 18<sup>th</sup> century linked with the 1<sup>st</sup> industrial revolution, the major development during this phase was mechanization of fabric production & development of textile and steel industry. The source of power was steam and hydropower. Initially work equipment was animal and human which was replaced by machine although production and unemployment both increased. **2<sup>nd</sup> phase (1850-1914):** during this period form of energy increases by using electricity, gas and oil. **3<sup>rd</sup> phase:** the adoption of electricity and digitalization in production was popularized during industry 3<sup>rd</sup> phase. **4<sup>th</sup> phase:** Rapid changes were observed during this period like most of the human being connected with internet, digital tools. This is the period of digitalization, IoT, artificial intelligence and robotics and information and communication technology. But it is expected that this technological automation deeply affects the unskilled labour forces. Some occupations are to be in developing stage due to the latest revolution while some are towards disappearing (**Karanikola & Panagiotopolos, 2018; Kurt, 2019**).

### **Industrial revolution 4.0:**

4<sup>th</sup> industrial revolution generally related with technological development and changed the concept of employer-employee relationship as it is influenced by qualification, style of working, skills required. The use of digital system changed the whole production process. In other words it changes the production process and this digital transformation affects the social life, demographic structure and need and priorities of the

country. The term “4.0” refers to the 4<sup>th</sup> industrial revolution that is altering traditional industries or the era of machine communication and characterized by discovery of technology, AI, IoT to help human being by improving quality of life. This revolution is mainly influenced by globalization, increase research in the area of technology and competition etc. When organizations, manufacturers, producers, employees and individuals stepping into 4<sup>th</sup> industrial revolution it embraces them with new technology in order to successfully accomplishment of the goal (**Mikulic & Stefanic, 2018**). Industrial revolutions bring endless changes in human beings life in many ways like interaction with technology, communication which affect their lives directly. For a short time span, organization may be able to operate by partial implementation of IR 4.0 framework but it is not for a long time solution. Organization must have to completely adopt the IR 4.0. A person needs to be up to date to redefine the skills and frame of mind to handle the rapid technological changes (**Karanikola & Panagiotopolos, 2018; Rymarczyk, 2020**). Since the 1st industrial revolution to till now human being do not want to stop them to be innovative. Thus it becomes necessary for organization & employees to change themselves according to the flow. Adoption of changes is not easy task for employees as well as the organization, as they have to change the policies, procedure or to train the employees according the new scenario.

### **Key drivers of industry 4.0**

**Robotics:** with the help of robot technology goods and services are produced and delivered too with little or even no human interaction. The robots are designed to serve the specified repetitive function. It helps in enhancing productivity as well as saving monetary capital (Gunathunge & Lakmal, 2021).

**Big data analytics:** it is advanced analytical technique to analyze the extensive data set from various sources, size. Now a day’s every company realizing that if they able to capture all the data that flow into their operation, then they can use analytics to extract tremendous value (Gunathunge & Lakmal, 2021).

**Internet of things:** also known as internet of everything and it is the global network of interconnected things that communicate via protocols. People may use the internet to work smarter and enable easy control of their lives (Gunathunge & Lakmal, 2021).

**Cloud computing:** refers the distribution of on demand computing services like applications, processing power, storage and pay per use basis. Companies may rent storage, database connectivity from a cloud service provider rather than owning their own equipments. It gives advantages to the companies to avoid the huge cost of building and maintenance cost. Despite its advantages still it is an emerging concept (Rymarczyk, 2020).

**Industrial revolution 4.0 and management of Human resource:**

The industrial revolution allows industries to produce automated goods and services. The aim of this revolution is to increase automation, interconnectivity and real time data to create a well connected environment to enhance productivity, performance and new opportunities for the employees at workplace. Earlier management of human resource was mainly focuses on day to day responsibilities, managing labour relation and keeps them satisfied. Modern HR management is different in many aspects while we compare it with the traditional ways. The latest revolution giving more importance to the human as they are the important resource to achieve the goal of the organization among all other the resource (capital, raw material, fixed assets etc.) employed in the organization. Organizations are moving towards strategic management practices. The industry revolution eliminating the lines between human and machine. The concept of business changed a lot after the introduction of AI. IoT, Robotics and many more like the emerging technologies helps in reducing production failure, improved quality of work and better life standard of employees. The emerging technologies and advancement in style of work reshaping the structure of the industries. It is quite natural when the transition from one phase to another happens various problems were observed but it is the responsibility of the organizations to up skill and re skilling the employees to cope up with the existing work environment. Thus this is essential to understand the change and restructuring the organization (Gunathunge & Lakmal, 2021). According to literature review the following are the major changes that should be implementing for the effective adoption

1. Developing new leadership style according to IR 4.0
2. Managing the integration of technology in the workplace.
3. Enhancing the experience of employees
4. Building an agile and personalized leaning environment;

**Literature Review:**

**Mikulic & Stefanic, (2018).** In this study a survey was conducted where result reveled that approximate 55% employees find it easy to adopt modern technology whereas 9% employees feels difficulty due to technical issues, fear of change and repression, error and lack of previous knowledge. In many studies it was found that If the employees are not trained it will be quite difficult to deal with machine and its system, for the adoption of the changes it is necessary to adopt the changes **Muljani & Ellitan, (2018).**

Study revealed that generation Z (1997-2012) needs soft skill as well as hard skill to succeed in the 21<sup>st</sup> centuries I.R 4.0. To respond the challenges in this technological revolution gen Z need to be a critical thinker, creative, good communicator, decision making skill and must have knowledge how to collaborate or coordinate in different situations. In another study it was also confirmed that importance given to development of communication & leadership skills. Engineering education need to be added in the curriculum to adopt the changes (**Jarosz, et al., 2020 ; Ismail, Nugroho & Rohayati (2023).**

**Iqbal & Yadav (2021).** In the study the authors confirmed that 4<sup>th</sup> industrial revolution was a fusion of technology, biology and physical factors and it will affect the employment levels as employees needs more advanced intellectual skills to get the creative jobs. The positive effect of the IR 4.0 depends on how the policies are effectively formulated and implemented by the leaders within any organization.

**Kurt, (2019).** In the study author examined the conceptual framework of the about IR 4.0. After reviewing the literature it was concluded that changes related to this revolutions are inevitable. Various changes like social relation, cultural structure, skills requirement was observed due to this revolution. Transformative changes in labour relation were also observed.

**Puhovichova & Jankelova, (2020).** The finding of the study revealed that due to widespread introduction of digitalization, technological unemployment increased but this happen only for short term in long run quality of the human resource will be improved. It is necessary for the organization to develop smart HR 4.0 strategy to get the competitive advantages by adopting the latest trend & technology. Generation Y & Z became the most active participant of this revolution. They plan their career themselves; approached for job opportunities through their mobile applications and they are prioritized by IT sectors. It is also confirmed that Leadership style need to change for management of smart HR.

**Harahap & Rafika (2020).** In the study the authors conclude the 4<sup>th</sup> industrial revolution brings many opportunities for the millennial's/ gen Y employees as well as barriers. The new change creates a situation of human vs. machine competition. The study revealed that in near future more than 50% job will be decreased due to this industrialization. Production process become easier, more dependent on technological and less human based. According to this study the biggest problem due to this revolution is unemployment in Indonesia.

**Pandian, (2018).** The author revealed that the use of automation process, use of robotics and artificial intelligence create problems for the employees. For adopting the new trends employees needs training, skills up gradation. This is the human nature that they resist the changes but for the survival they have to adopt the changes.

**Rymarczyk, (2020).** In the study the author conclude that the progress of the technological development divided into four phases that is known as industrial revolution. The present revolution was 4.0, started during 2000 and in this period internet, information and communication technology, autonomous vehicle, 3D printing was introduced largely.

### **Opportunities of Industrial revolution 4.0:**

**New job roles:** due to the 4th industrial revolution the role of the workforce has been changed according to the requirement of current scenario. In this new revolution the HR professional should know the machine learning & AI, should be a big data specialist and new technology specialist.

**Job automation:** future of job survey revealed that human labour reduced from 70% to 58% by 2025. Number of surveys shed light on the fact that in near future maximum job will be automated and full time job decreased. People will get rid of the full time and tough job routine, AI will take care of them. It will provide them more freedom, balanced work life and ample time to spend with family.

**Remote working:** the remote work may be defined when employer gives the freedom to the employees to work from anywhere, where he/she is more productive. It may be a location at home, in a café, in another state, even in another country. The internet generation is lucky to have all these kind of work opportunities which makes them more productive as well as available them with family.

#### **Challenges of industrial revolution 4.0:**

**Lack of previous knowledge:** generation X (1965-1980), Y (1981-1996) and Z (born between 1997- 2012) are aware of technological advancement. In fact generation Z is known as I-generation (**Ismail et al., 2023**) or “Face book generation” whereas gen Y is known as millennial and also technical savvy generation. The younger generation likes to spent time with technology while older generation known as baby boomer feels problem to cope up with the latest technology because this generation is not much aware about computer literacy or in another words computer was not very popular by this time. Thus due to lack of previous knowledge they feels problem although they are near retirement.

**Job extinction:** more than half of the job in future will be automated. The automation due to industrial revolution causes unemployment for the one who don't have technical knowledge. Some industries upgrading the skills of the workforce while other adopting robot at workplace that will handle the customer problem. The adoption of robotics leads to unemployment. For the survival in this technological equipped environment it is necessary to make oneself updated.

**Lack of standardized instruction for using modern technology or technological immaturity:** for providing safer and precise operations it is necessary to provide adequate instructions so that errors, injuries and accidents ratio can be minimized.

**The fear of error:** many employees feel fear at the beginning of the modern tools and technology application. They assume it their personal failure which hinders their performance.

**Skill disruption:** due to the innovation in ICT, AI, Robotics the demand for skillful employees increased at workplace. Existing human resources needs to be upgrading, in fact the whole ecosystem like; government, organizations, educational institutes need to be change towards the adoption of the revolution. There is no space for the one who following the traditional workforce, if they resist the change the kicked out from the industry.

**Capital requirement:** for the successful implementation of the model huge capital is required. Organizations need to be equipped according to the requirement like changes in the infrastructure, training of the employees etc.

**Various other challenges:**

Recruitment & selection of the employees.

Problem in Cooperating with the educational intuitions.

Prediction about the skills needed in the future that the employees must have.

Managing and storing data.

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