INDUSTRY 4.0: EMERGING CONCEPT: OPPORTUNITIES AND RISK FOR INDIA

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ABSTRACT

Industry 4.0 terms is referred to fourth Industrial Revolution. The revolution according to this era was characterized by use of digitization, Computational power, IoT, Business Analytics, Artificial Intelligence, advanced robotics and specially use of all these technologies in manufacturing process. If we consider Indian economic structure, it is seen that India depends heavily on its service sectors for growth. Manufacturing sector is a cutting edge today and hence heavily needs high level of skills to boost growth. By considering this some countries already stated adopting Industry 4.0 techniques to improve the manufacturing techniques. By considering all issues related to global warming and its impact on environment itis recommended to follow the technology in manufacturing which will lead to minimizes the waste, maximizing the production capacity, full utilization of recourses, product modifications as per green code, and even modifications in supply chain activities is the basic concept behind technology used in manufacturing according to the concept of Industry 4.0.With the help of this research paper we will try to focus on the concept of Industry 4.0 , what will be the possible model to follow Industry 4.0 and opportunity and Risk for India to adopt Industry 4.0 concept.

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Keywords: Industrial Revolution, Business Analytics, Artificial Intelligence, robotics, Service sectors.

Introduction:

The term "Industry 4.0" mean implementation of smart industry in which smart devices are used to established network in the activities related to raw materials, processed materials, final products, machines, new tools, robots and human resource. This smart industry is characterized by flexible production process, optimum use of resources and integration of customers and business partners in all business process.

Common picture that can be observed in smart factory is that men, and machines or robots will act as equal partners. According to the concept of I 4.0 is there will be combination of new technologies like big data, processing speed, Internet of Things (IoT), Business analytics, AI, robotics, and man machine systems and so on. I 4.0 would mean the use of all recent and updated technologies in production process. This will result in the "Smart Factory", which is characterized by advanced process, resource efficiency, and ergonomic design.

Digital technology is responsible to brings major changes in the business models.

Production system must be more flexible to adopt a lot of technology innovations into reality as quickly as possible. This can be achieved with the help of two main factors that are hardware and software system. Innovation and advanced technology can be applied to the smart production in a way to influence the entire product life cycle right from product design till the product recycling.

The objectives of all these activities is to increase productivity in minimizing time period between the development of a new product and its delivery to customers in the market for 50%, efficiency and energy savings to ensure competitiveness in the world market.

Objectives of Study:

1. To understand the concept of Industry 4.0.
2. To analyses the structure of Business organizations according to Industry 4.0.
3. To study opportunities and threats in implementation of Industry 4.0.
4. To analyze position of India to follow the industry 4.0 concepts.

Following image try to elaborate the First Three Industrial Development in India.
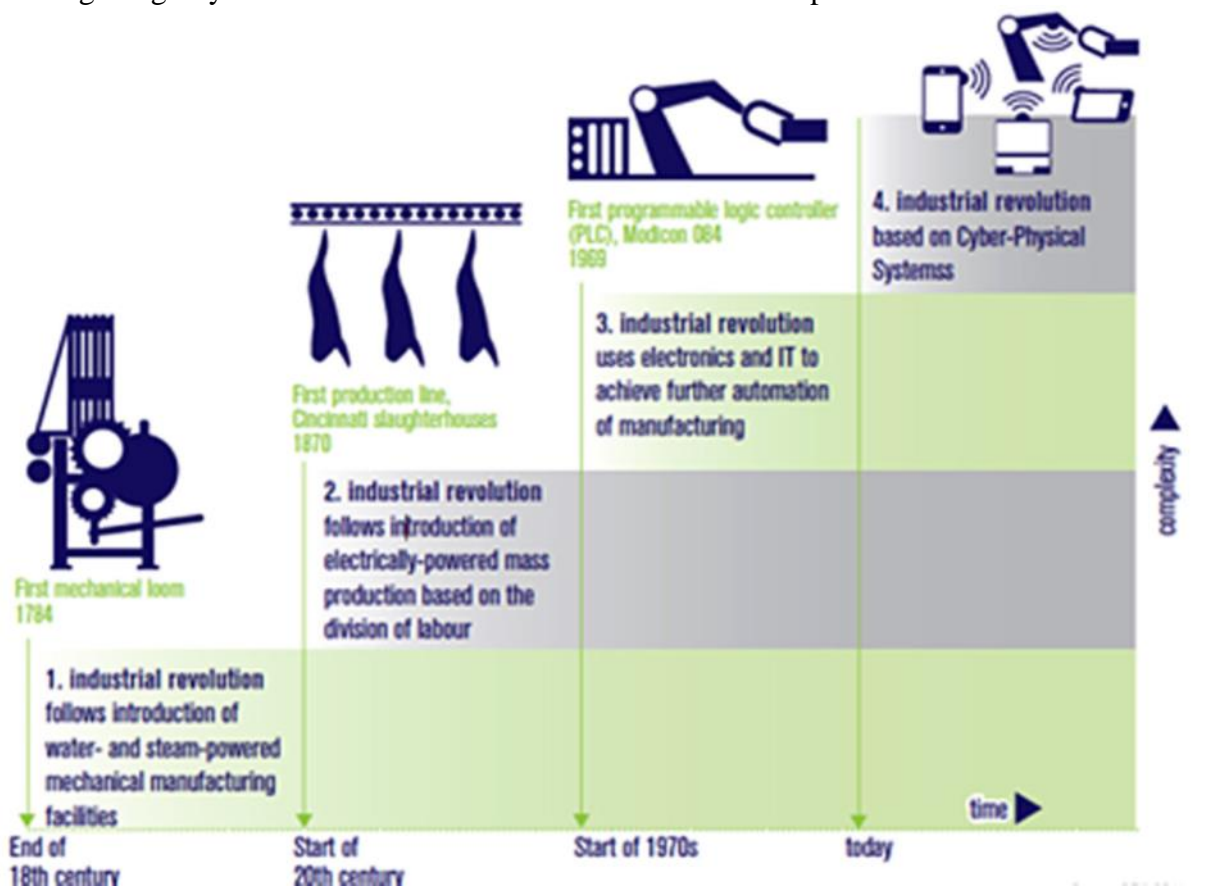
Initially India was participated in various economic activities which contributed to the growth of the economy. During this era textile industry established in India and it was the major contributor to the national income. Before industrial revolution, India had a very well-established cotton industry and its products were exported to various parts of the world including Europe and America. The textile industry in India achieved this by access to low waged labor and skill that resulted in high quality but low-priced products during late 17th century

Second industrial revolution was characterized by use of electric power for increasing or large production.
In this era jute textile mills were established in Bengal and textile mills in Bombay and Ahmadabad. During 1911, J.R.D. Tata established the first steel mill in Jamshedpur.
Up to two world wars industrial development in India is very slow and poor.
Industrial Revolution industry development plan mainly focus on development of heavy industries, R&D teams in organizations, higher education universities, and improvement in agriculture activities.

1980 is the beginning of third Industrial Revolution. This revolution introduces new economic thinking in India. Economic freedom started during this phase of Industrial development. Many organizations enter into technical collaboration with foreign firms. Local and domestic organizations undertook various initiatives like implementation of research and Development activities, updating in productivity, and innovative management techniques for better allocation and utilization of resources.

What is Industry 4.0?
The term "Industry 4.0" indicates the smart factory having digital devices that are networked and these devices communicate with raw materials, semi-finished products, products, machines, tools, robots, and humans which all are involved in different activities of the organizations. Smart industry is characterized by flexible production system,

optimum use of resources and integration of customers and business partners in the business process.

In such type of advanced type of factory, machines and men will be equal working partners; Artificial intelligence is implemented in the terms of robots and other devices as compared to the previous generation of robots. Like this the use of digital technology in production industries brings prominent changes in the business models. In order to implement this changed model in organization digital innovation is required to adopt by the organizations. Smart industry mainly focuses on flexible production process with the help of hardware and software system for the real-time evaluation of data.

The objectives of development of this smart industry include:

1. To increase productivity.
2. To increase the efficiency of production.
3. To save energy.
4. To identify competitiveness of India in the global market.

Readiness of India towards Industry 4.0

World Economic Forum (WEF)has performed holistic research indicating readiness for adoption to this new network model by various countries.

Key indicators for identifying how countries are performing in the digital world is a Network readiness index. And this readiness index is based on some of the following criteria:

-Increasing pressure to implement innovative and new technology in productions system.
-Competition with rapidly growing digital business and companies.
-Legal and political approaches to adopt digital technologies and

According to above mentioned network readiness index criteria, India ranks 91 out of 139
Countries.

As per German Engineering Federation (VDMA) there are six-dimensional model to assess

The readiness of enterprises, these includes following six dimensions:

1. Strategy and organization
2. Smart factory
3. Smart operations
4. Smart products
5. Data services
6. Employees

Current Status of Industry 4.0 in India:

India ranks sixth as a largest manufacturing country and so India focus on the manufacturing sector forms an Integral part of the country's long-term vision. Government is initiating various activities like 'Make in India' campaign. And also, Government is encouraging various entrepreneurship development activities to promote the manufacturing sectors in India. The expected share of manufacturing that government wants to rise from 17 to 25 per cent. Government of India have taken the number of initiatives and policy reforms like

Introduction of the GST (Goods and Services Tax)
FDI policies are made easy.

A major part of the Indian manufacturing sector is still in the post-electrification phase as it uses technology limited to systems that function independently of each other. According to requirement of Industry 4.0 concepts integration of physical systems on cyber platforms and this basic premise is still not sufficient in India. It has been observed that Individual, Small& Medium Enterprises in India cannot adopt full automation technology due to high cost involved in Automation. So if try to summaries the current position of India to accept or adopt Industry 4.0 concept, we find that:

1. Ignorance of the technology in India.
2.Lack of Systematic approach towards modernization in Indian organization.
3. It seems that even organizations are not willing to adopt the new technologies.
4. India has availability of low waged labor and due to this organizations are not ready to adopt automation
5. Each industry does not produce large volume of

products so not ready to adopt the automation.
6. Skill sets required to adopt the automation in
industries is absent in India.
7. Government plays a vital role in taking decisions
regarding automation and industrial Development.

Government Initiatives:

Indian government, its policies and strategies play an important role in Development of manufacturing industries and adoption of Industry 4.0 concepts.
We can summarize the initiatives of Indian Government as follows:
2015 ---Launched an IoT Policy.

2015 - National Policy for Advanced Manufacturing to enhance India's global manufacturing competitiveness.

Mission on Cyber Physical Systems (CPS) and allotted an initial corpus of INR100 crore for commencement of the mission.

2017 -- National Manufacturing Policy, 2017: which focus on adoption of digital platforms for I4.0

Centre of Excellence (CoE) on IT for Industry 4.0.

2018-19 -National Program on Artificial Intelligence.

2018-19 - Mission on Cyber-Physical Systems

Role of Organizations: The industry, particularly the large and multinational manufacturing companies, will adopt 4.0 if they see returns on investment.

It is essential to prepare the roadmap for adoption at various levels of technology appropriate for different scales of operations especially for MSMEs.

Opportunities and Risk involved in industry 4.0 concepts for India:

There are several risks associated with the adoption of Industry 4.0.

India still lagging in adequate physical and digital infrastructure. Indian government is taking continuous efforts of to enrich the industry sectors with required infrastructure such as roads and electricity.

India's telecommunication network still suffers from slow data speed and unstable connections.

As per the study report proposed by KPMG India Cybercrime Survey Report 2017, 79 % of corporations in India have acknowledged cyber security as one of the top five business risks.

Apart from cyber security, the regulatory environment pertaining to data privacy would also need to be strengthened.

High cost of digital technology is yet another factor. Building the factory of the future with an entirely connected system could require significant capital outlay.

Getting access to digital technologies remains a challenge due to the high cost of these technologies.

There is still a leadership gap. India lacks business leaders ready for Industry 4.0.

Although Indian companies have strong traditional leadership, there is a deficiency of digital experts with a strong vision for Industry 4.0 adoption.

India's present workforce lacks skill and expertise in new age technologies such as data analytics, additive manufacturing, and IoT.

The government, industry, and academia need to collaborate to enable an Industry 4.0 ready workforce.

The availability of adequate talent in both terms i.e. Strategic leadership level and factory floor can prove to be a significant challenge for Indian companies on their way to Industry 4.0 maturity.

The traditional organizational structure incorporating human-human hierarchy is needed to replace by functions where humans and machines would interact at

strategic and operational levels.

Mostimportantly, there is a need to change traditional mindsets and skillfully manage that change across organization.

With Industry 4.0 automating most of the technical tasks, thefocus could turn to soft skills for employees to be successful.

The current workforce would need to be re-engineered to fill new roles.
The next generation workers need to be digitally strong.
At present, India is struggling with low vocational training capacity. It is only 0.8 per cent of the total workforce as compared to 6.7 per cent in the US and 11.5 per cent in China.
The skilled workforce is only 4.7 % in India as compared to 24 % in China and
96 % in South Korea (PWC and FICCI, 2019).

Repetitive jobs may disappear. This is likely to leave a deep impression on employment landscape.

There may be new role for the labour force in the form of supervisory, managerial and cross-functional, demanding diverse skill sets.

Industry 4.0 is likely to create widespread disruption in the labour market.

The key stakeholders—the government, industry and training institutions—have to come together to re-engineer theeducation system to make employees competitive.

Conclusions

After the analysis of the industry 4.0 concepts, Requirements, initiatives and current position of India in adaptation phase of this Industry 4.0 concepts, following conclusion can be drawn:

1. Concept of Industry 4.0 is completely technology oriented and it requires tremendous changes in manufacturing technologies to adopt this 4.0 strategy. For large scale production these concepts are very important.
2. According to industry 4.0 concepts industry models will have drastic changes. Industry will be a Smart Industry with smart products, Smart process, Smart operations and prominent use of Information Technology in all sense of manufacturing.
3. As far as opportunities and threats are considered for India it can be concluded that threats are more due some prominent factors like non-awareness of the technology in India, availability of Cheap labor and due to this organizations are not ready to adopt automation , Each industry is not large scale where volume of products is very high so as to adopt the automation, India has non availability of skill set to adopt the Automation.
But if Indian Government along with Industries and Higher education Institutes follows the adaptation policies for Industry 4.0 then India and Indians will have very high growth opportunities.
4. We can conclude that India is not completely ready for adaptation of Industry 4.0 model but for future growth and development we need to start adopting these concepts.

India should adopt digital technologies to become a global manufacturing powerhouse.

Since the launch of "Make in India," some progress has been made. The global manufacturing process is transformed by digital technologies such as IoT and robotics. But adoption of digital technologies in Indian industry is still in its infancy. There are many advantages for India.It has a number of factors in its favor that are mainly huge and growing domestic market, a large number of workers with diverse skills, demographic dividend, English-speaking scientists and engineers, research and development institutions, and a large startup technology base.

Along with being a catalyst for growth, digital technologies may be disruptive with far reaching effects on productivity and employment.

Following are the implications for India:

1. India's low labor cost advantage may lose.

2. With the right ecosystem, India could gain a significant share of embedded software services, data management, and supply chain restructuring.

3. Along with physical infrastructure, large-scale investments in requisite digital ecosystem are needed.

Advanced technologies such as 5G mobile network, wireless sensor network, 3D printing, industrial e-commerce, cloud computing, AI, and big data will determine industrialcompetitiveness.

Global industry is at the brink of the next technological revolution. The combination of intelligent machines, modern communication, big data, and cloud computing is causing disruptive changes in industrial production. "Smart Manufacturing," "Industry 4.0," and "Industrial Internet" are labels that will characterize the upcoming transformation. The new technology paradigm will reshape the dynamics and the rules of global competition. The race for advanced industrial production may decide the fate of large corporations, and also determine the overall development of the economies.

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