

Impact of Industrial Revolution 4.0 on Indian Economy

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Abstract:

Following the three industrial revolutions that have led to important technological developments in more than two centuries, the fourth industrial revolution is presently taking place in the world, which has embraced technology by the factories of the world to a whole new level. This fourth industrial revolution, or Industry 4.0 (I4.0), is bringing different silos together into a production system through a network, allowing real-time data sharing and facilitating machine-to-machine and human-to-machine phenomenal expressions. Speed and scale enable decentralized decision-making, giving rise to value chains integrated with interconnected cyber and physical systems, and an unprecedented level of automation. Digital production of the entire manufacturing value chain begins with the purchase of raw materials, and the expansion of customer service using mobile devices, communication networks, sensors and actuators is changing the way that factories operate worldwide. In the current scenario, all industries are trying to spread their hands around the world to become a strong competitor in the industrial world. Industry 1 includes many technologies that provide a good platform for innovative and creative solutions. To implement such a condition, it is necessary to use advanced prediction tools to explain the uncertainties in which converting data into a systematic process transforms the data.

Key Words: Industry, Revolution, Corporate, Economy.

Introduction:

Industries with profitability also take care of customer satisfaction, product quality and customization and production costs. Thick digital transformation is underway behind the scenes of the world's leading industries. They are expanding their product portfolio with digital functionality and investing in data analytics for innovation and significant improvements in functionality as a basement capability. India and China have been competing for the lion's share of global production for the past six years. Even though India has infrastructural problems, bureaucratic scarcity and inconvenient supply of resources, India supplies a large number of skilled workers, and some of the largest manufacturers such as Havels, Godrej and Bosch have their units in India. India's dream of becoming the world's favorite production destination in the future is a huge task. The fourth industrial revolution is underway, and will not hold back. Industry 4.0 will be a challenge and may also have answers for India's continued benefit to the global manufacturing process. This is a time of advanced manufacturing, composite materials, quantum engineering, 3D printing and robotics.

Definition

The Industrial Revolution 4.0 defines the system of manufacture processes depends on the autonomously communicating devices with each other and know-how along the value chain: a model of future smartfactory which makes decentralized decisions based on self-organization systems, create a virtual copy of the corporal world. In industry 4.0 computer-driven systems observe physical processes. It also known as fourth industrial revolution. The concept of Industry 4.0 is broadly used across Europe, mainly in German's production sector. At Hanover fair organised in January 2011, Germany government introduced a new concept as one of its "strategic initiatives" termed as the Industry 4.0 that is adopted as a part of the High Tech approach 2020 action plan. The Industry 4.0 is a vision, an idea to use revolutionary technology for industrial advancement.

Objectives:

- To study industrial revolution
- To study industrial revolution 4.0

- To study challenges before industry 4.0 in India
- To study benefits of Industry 4.0

Literature rearview:

Industry 4.0 smart manufacturing for future, William MacDougall, Germany trade and Invest (GTAI) 10117, order no 20750 From book this we came know that in Germany, lot of prominent institutions, research and trade actors have joined their hands to work together in order to realize close vision of Industry 4.0. Some of them are

Acatech -National Academy of Science and Engineering, it depicts interests of the German scientific and technological groups at home and abroad.

DFKI -German Research Centre for Artificial Intelligence, Germany's leading research centre.

Fraunhofer-Gesellschaft -Research organization that maintains 66 institutes and independent research units.

Smart factory -It is the first European vendor independent demonstration factory for industrial application of state of the art communication and information technologies.

FESTO -Major supplier of automation technology for process and factory automation.

History of Industrial Revolution:

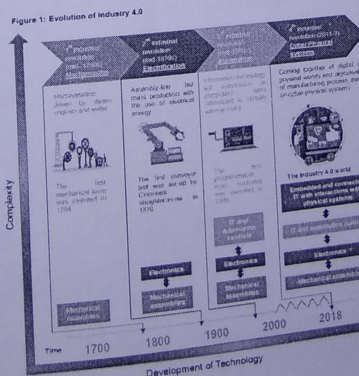
The first Industrial Revolution took place in Europe and the United States between the 18th and 19th centuries. In the first industrial revolution the development of steam engine, iron and textile industry played a major role. Second Industrial Revolution took place between 1870-1914 at this stage, the previous industries increased and new industries was expanded to facilitate the production of large quantities based on electricity. Major technological advances in the Second Industrial Revolution include telephones, light bulbs, phonographs and internal combustion engines. Third industrial revolution has started since 1980. This phase was known as the digitizing era. Today, technology advances from analogue electronic and mechanical devices to digital technology today. Advances in this era include personal computers, the Internet and information and communication technologies (ICTs).

Industry 4.0 Key Technologies:

I4.0 brings together know-how forces such as Internet of Things (IoT), cloud computing, big data analytics, additive manufacturing, Augmented Reality (AR), robotics, cyber security and Machine-to-Machine (M2M) communiqué. While some of these digital technologies are previously in use in industrial applications, some others are still not prepared for application at scale. Manufacturers require to cautiously pick the right mix of technologies that would maximize proceeds on investment.

Internet of Things (IoT):

The Internet of Things means IoT enables real-time machine-machine interaction by linking them over a network and help establish a linked value chain.



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Big Data Analytics:

Data analytic capabilities to sustain intelligent and real time conclusion making

Augmented Reality:

AR could improve business operations by leveraging mathematical modeling, AI and virtual realism.

Cyber Security:

Cyber security helps set up protected communication protocols to ensure data safety

Cloud Computing:

Cloud computing offers a stage equipped with vast computational, storage and networking capabilities, which would facilitate the interaction between various technologies

Additive Manufacturing:

Additive manufacturing helps production in small-batches in a cost-and-time-effective way, by reducing the lead time from product designing to product release and improve customization

Robotics:

consistent robots to facilitate the automation of manufacturing processes, helping improve competence.

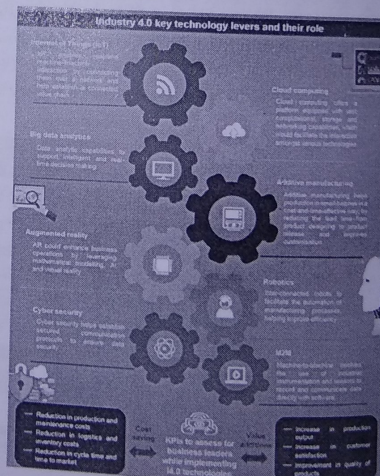
M2M:

Machine-to-Machine involves the use of industrial instrumentation and sensors to record and communicate data directly with software.

Industry 4.0 in India.

Worldwide, the I4.0 market is probable to reach INR 13,90,647 crore by 2023. Countries such as the U.S., China, Japan and European nations like U.K., Ireland, Sweden and Austria all have in progress adopting I4.0. In India, the sixth-largest developed country, the industrialized sector forms an integral part of the country's long-term dream as seen by the government's strong focus on the 'Make in India' movement. The government aims to supplement the share of manufacturing in GDP to 25 per cent from the current 17 per cent, by 2022. A number of initiatives and policy reforms, such as implementation of the GST (Goods and Services Tax) and easing FDI policy have been taken by the government. At present, India lags its global peers in I4.0 adoption.

1. Non-awareness of the technology
2. Systematic approach towards modernization.
3. Non-Willingness to adopt the new technologies
4. Availability of Cheap labor initiates reluctance to adopt automation



5. Volume of products is not very high so as to adopt the automation increases ROI for the investments.
& Non availability of skill set to adopt the mechanization.

Industry 4.0 in India

National Manufacturing Policy, 2017

In July 2017, the government rolled out a new policy to push the manufacturing share to 25 per cent of the GDP by consolidating Make in India initiative, with focus on adoption of digital platforms for I4.0.

Centre of Excellence (CoE) on IT for Industry 4.0

This CoE would act as a knowledge centre for entrepreneurs and start-ups, propagating the concept of IT and its application in I4.0.

National programme on Artificial Intelligence

In the Union Budget 2018-19, the government announced that NITI Aayog will create a road map for national AI programme focusing on developed new AI applications.

Mission on Cyber-Physical Systems

As per the Union Budget 2018-19, the Department of Science and Technology will launch CPS mission to support establishment of CoE for training in robotics, AI, digital manufacturing, etc.

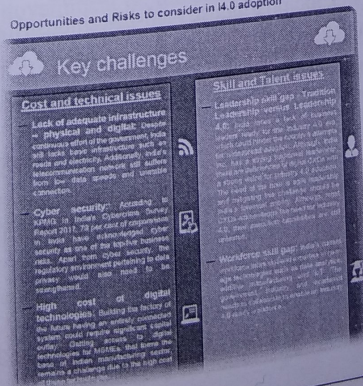
Industry 4.0 challenges

As Industry 4.0 continues to change the way we interact with the world around us, new challenges arise. Here are the main challenges you may face in the not so distant future:

- ❖ New business models — the definition of a new strategy
- ❖ Rethinking your organization and processes to maximise new outcomes
- ❖ Understanding your business case
- ❖ Conducting successful pilots
- ❖ Helping your organization to understand where action is needed
- ❖ Change management, something that is too often overlooked
- ❖ Examination of company culture
- ❖ The genuine interconnection of all departments
- ❖ Recruiting and developing new talent

The Internet of Things (IoT) will connect machines and systems and allow seamless data transmission across all departments of a workplace, opening up opportunities for entirely new business models in manufacturing, computing, and many other industries. To thrive and indeed survive in tomorrow's world, you will need to look at each of the above challenges and act upon them as soon as possible. But, it's important to remember that above all, Industry 4.0 requires businesses and organisations to adopt a fresh thinking mindset, understanding the power of the inter-connectivity realised by new technologies. By being able to adopt a new mindset, refresh your company culture, adapt your business model, create new roles and nurture the talent to fulfill those roles, the rest will follow, as long as your change is managed closely throughout the process.

Opportunities and Risks to consider in I4.0 adoption



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Industry 4.0 benefits

Similar to digital transformation, the benefits of Industry 4.0 will ultimately help a business become smarter and more efficient.

To summaries, here are the key benefits of the new industrial revolution...

- Enhanced productivity through optimization and automation
- Real-time data for real-time supply chains in a real-time economy
- Greater business continuity through advanced maintenance and monitoring possibilities
- Higher quality products as a result of real-time monitoring, IoT-enabled quality improvement and cobots
- Better working conditions and superior sustainability
- Personalization opportunities that will earn the trust and loyalty the modern consumer

With an understanding of what you have to gain from harnessing the power of Industry 4.0, taking the actions required to realize it will be all the more easier.

It's true that Industry 4.0 comes with its fair share of challenges, but by facing them head on it's clear to see that you have everything to gain.

Conclusion:

India has a population of 1.2 billion people and has increased resources to say the least. However, the way things are handled historically, India has to work again; the world around us is changing. As we discussed earlier, the fourth industrial revolution is on its way to occupying the world, and there are often great opportunities. With Industry 4.0, it is possible to create long-standing system with qualified employees and to sharpen and greatly customize India in production. Although it is very difficult to manage the process centrally, there can be strong consequences if players in the system apply the correct lever. It is important to communicate the thoughts that will benefit the players in the public and corporate sectors if the initiative of Industry 4.0 is integrated. By adopting Industry 4.0, we will have a greater competitive advantage over global competitors in the economy.

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