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Industry 4.0 and Application of Artificial Intelligence - A Study

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ABSTRACT
Changes in the field of Information Technology have forced the economies to change of every continent. Artificial intelligence has gone from behind a buzzword to being implemented in many sectors of economy. In today's tech environment, corporate houses have a lot of scope to improve team's productivity and have a smooth flow of customers or leads for their business. With the help of AI, more value can be added to the business.
The economies across the globe are witnessing a wide range of opportunities for optimizing the manufacturing processes. Technology has drastically changed how organizations go about their operations in manufacturing or services. Thus, Artificial Intelligence in business management helps in every aspect of a business,
Keywords: Industry 4.0, Artificial Intelligence

I. INTRODUCTION

Periodical industrial development i. e., industrial revolution viz., Industry 1.0, Industry 2.0, Industry 3.0 and Industry 4.0. has been witnessed in the world of business.
Industry 1.0: -Power Generation: This was occurred after the introduction of power loom in 1784 in which mechanization of production facilities with water and steam.
Industry 2.0: - Industrialization: This witnessed introduction of Assembly Line in 1820. Electrification drives mass production in a variety of industries.
Industry 3.0:- Electronic Automation: Development of programmable logic controller (PLC) in 1969 and application of electronics and IT to automate production processes
Industry 4.0: - Smart Automation: Increasing use of Cyber Physical System (CPS). Industry 4.0was initiated in January 2011 by German Federal Government as a future project. With the introduction of IPv6 in 2012 virtually unlimited addressing space becomes available. Governments, private companies and Industry associations have been focusing on Industry 4.0 and making investments since 2010.

II. OBJECTIVES OF THE STUDY

The objectives of this paper is to discuss the Impact of the Artificial Intelligence
1) To study Impact of the Artificial Intelligence on the economy.
2) To know utility of the Artificial Intelligence in the economy

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III. RESEARCH METHODOLOGY

Research Methodology is a scientific procedure for acquiring knowledge based on empirical observation and logical reasoning and it is analytical, descriptive and quantitative research. Widespread secondary data sources had been used for this research. The Secondary sources, explain the theoretical and conceptual concepts related to Artificial Intelligence.

Technologies In industry 4.0 :

In industry 4.0, manufacturing, units have machines that are augumented with wireless connectivity and sensors. The types of sensors include cc camera, pressure sensors, temperature sensors, motion sensors etc..Machines augumented with sensors are connected with a system that can visualize the entire production line and takes decision on its own.

Some more development issues are mentioned below :

- **Evolution of business models** Mass production will become more individualized, leading to customer-specific products integrated into new service offerings.
- **End-to-end digital engineering** Preplanning will give way to a more active, autonomous, and self-organizing production.
- **Top floor–shop floor integration** Factories will adapt automatically to changes thanks to more transparency and autonomous decision making.
- **Real-time, value-added networks** Supply chains will evolve into highly adaptive networks managed through real-time monitoring and feedback.
- **Enhanced work environments** Work will be less centralized, more fluid, more project oriented, and more virtual and international.

Beside this, some benefits are listed as follows -

- Continuous Process Improvement through Variability Control
- Process operates at its full potential to produce conforming product.
- Process behaves predictably to produce as much conforming product as possible with the least possible waste.
- Focus on early detection and prevention of problems
- Helps identify bottlenecks, wait times, and other sources of delays within the process.

As such, Industry 4.0 includes Smart manufacturing in a Smart factory and it is the trend towards Automation of Processes with the help of data storage, data exchange, data access, data analytics which includes Cyber Physical Systems (CPS), Internet of Things, Cloud computing, Cognitive computing and Artificial Intelligence.

Current Status of NextGen Technologies in India :

As per the joint study conducted by Microsoft and the Internet and Mobile Association of India (IAMAI) – India is among the top three talent markets, producing 16% of the world's AI talent pool. Additionally, As per the report titled 'From Buzz to Reality: The Accelerating Pace of AI in India'- Artificial intelligence is no longer a fringe technology for Indian companies. The (AI) market is expected to grow at the second-fastest rate of 20% among major economies over the next five years, behind only China. This study was conducted on 343

enterprises and organisations that implemented AI, and 148 providers and tech players that provide AI solutions. It found "the thrust in adoption for enterprises is maximum in sectors viz., communication, over-the-top (OTT), gaming, technology and financial services". The study stated that nearly 64% of the providers have AI or machine learning (ML) as a core element in their products and services making them "either ahead of or on par with their global counterparts". The study further found extensive penetrations of AI or ML across enterprises, with nearly 80% of them having at least one AI model in their production. Large enterprises have adopted AI at a much higher rate as it helps them solve problems at scale, and provides vast amount of data.Nearly half of the large enterprises are planning to build their own AI models in the next three years, and 45% of small enterprises prefer to buy pre-built models due to their high cost of in-house building. Large enterprises have recently increased their demands as a result of the Covid-19 pandemic to transform operations with AI. In a step forward The Government of India's NITIAayog came out with an AI strategy in 2018 and India became one of the first countries to talk about the use of artificial intelligence to address inclusion and social challenges. The adoption of AI has to be accelerated across all relevant sectors and value chains. The future of AI will be decided by a diverse group of stakeholders like researchers, private organisations and citizens.

Artificial Intelligence in Business Management – Global Scenario :

"Hyperautomation" - (i. e., Artificial Intelligence technology associated with Robotic Process Automation technology) is becoming a buzzword in the world of business. This can automate a wide variety of job that occupies lot of employees' work hours. This technology can perform tasks fast and with accuracy as compared to humans and which is expected to save time & reap huge profits. Additionally, MIT Sloan Management Review's 2017 Artificial Intelligence Global Executive Study and Research Project, 85% of executives believe that AI will help their businesses gain or sustain competitive advantage.

Artificial Intelligence for Business Managers :

A Manager needs to know how Artificial Intelligence AI can impact business and how to take advantage of it. Statistics indicate that organizations that leverage Artificial Intelligence in business management can benefit from the enhanced operational efficiency offered by the technology and outrun competition. With the increased interest in technologies like Metaverse, Blockchain, Web3, etc., business owners and managers need to understand where they stand in 2023 with their AI strategies to stay up to date in the market for future. AI technology enables machines to exhibit intelligent behavior to do complex tasks such as observing, learning, planning, and making decisions for problem-solving. By training a machine using a lot of data and AI algorithms machines can understand the data it processes and take actions accordingly.

Major use cases of Artificial Intelligence in managing business :

This include predictive analytics, process automation, customer analytics, security surveillance, and job optimization. Predictive analytics can help businesses to predict future trends based on their current business data.

Data-Driven Economy :

Big ICT giants like Google, Meta, etc., use billions and billions of data to analyze the needs of their customers and provide services accordingly. So business managers with the help of Artificial Intelligence can predict future trends, forecast profits, and make better decisions. As far as the financial sector is concerned about 40% of job cuts in the financial sector are expected to occur in money management due to the rise of robo-advisors replacing human fund managers.

Barriers for Adoption :

Here it is worth to note that data quality, infrastructure , scale and sensitivity or risks have been found to be the major barriers for enterprises for large-scale AI adoption. Providers also fail to develop minimum viable products (MVP), a product with enough features developed for early users and receiving feedback, due to a lack of infrastructure, tools and skills in data science.

As per the report titled 'From Buzz to Reality: The Accelerating Pace of AI in India' , India produces more talents than it consumes. Enterprises lack domain-specific expertise, data visualisation or analysis talents and data engineers and much of the talent is available specific to AI application development.

IV. CONCLUSION

Applications of AI in the manufacturing sector opens up a wide range of opportunities for optimizing the manufacturing processes. Technology has drastically changed how organizations go about their manufacturing operations. Thus, Artificial Intelligence in business management helps in every aspect of a business, it may be for simple tasks such as suggesting products or providing customers with basic customer service or in complicated measures such as conducting software tests and completing extensive problem-solving procedures. So, Artificial Intelligence had become an unavoidable factor in economies across the globe.

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