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Changing Trends in Indian Industries : Industry 4.0

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Abstract: *Today, progressions in innovation have brought the world nearer. Industrial Revolution 4.0 points to the fourth mechanical unrest identified with assembling and chain creation. It is driven by achievements in computerized advances, for example, Artificial Intelligence, mechanical technology, 3D printing, the IoT, Big Data and so on. The intent of this paper is to give an overview of Industry 4.0 and understanding of the nine pillars of Industry 4.0 with its plays and correlating the challenges and issues cooking with execution the challenges and to study the new trends and milestone related to it.*

Keywords: Artifical Intelligence, Indian Industries, Industry 4.0, Technology, Use cases.

I. INTRODUCTION

AI is a quickly creating field with robots affecting our lives with developing power. It has pulled in a significant spot in the new years. India has been relying upon three significant allies to be specific the government, private domains and education sector for the AI related exploration cycle and development. Further, there are steps have to be taken from corner to corner of these three gatherings, and their conceivable effect would be on business related concerns, administration difficulties and hindrances to build up an eco framework, accordingly it would accommodating to accelerate innovative work measure. Accordingly, in India there have been a few activities and advancements in the circle of AI, ML and mechanical technology, by the scholastic local area inside business cycles and purchaser ways of life. Henceforth, the Service of Commerce and Industry, Government of India, plans to animate the utilization of AI towards India's exchange and industry change. All things considered, its most income has been coming from agribusiness area and it is contributing almost 18 percent of offer in the complete Gross Domestic Product (Gross domestic product) of the nation (Sunder, 2018). In this way, however India is an agrarian country, it has been receiving the most recent advances in the agribusiness area so as to cultivate the development.

II. SIGNIFICANCE OF AI IN DIFFERENT SECTORS

AI is being sent in numerous areas and getting a ton of facilitate our day by day life assignments. Following are a couple of instances of how AI is upgrading various areas around the each and almost every corner of the world.

- **Government Research Program** - These associations use AI innovations and Machine Learning models across the Defense, Space, and Aeronautics Research and Development sections separately. Large numbers of these establishments have in-house AI brooding units, giving counseling and coaching administrations to fire up AI firms and AI administrations to other science and innovation foundations (both public and private) [1]. The Education Research Institutes and DRDO have the top level input across this classification.
- **E-Commerce Industry** - Artificial intelligence abilities are utilized across practically all capacities eCommerce. From Product Targeting, Market Segmentation, Pricing, Digital Platforms, Quality, Merchandise Classification, and Shipping and Logistics.
- **BFSI (Banking, Financial Services, and Insurance sector) -** The BFSI area is presently utilizing AI across different capacities:
    - Computerized Services to acquire an upper hand, drive efficiencies, and improve client experience.
    - Advanced mechanics and Natural Language Processing (NLP) to improve on-request client experience and fulfillment.

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- Reception of calculations in Investments to build portfolio returns and decrease chances, both for institutional and retail financial backers.

- **AI in Automobile Industry -**This area incorporates auto makers that are creating in-house AI and answers for driverless advances, including AIdriven Sensor, Radar, Lidar, and Optical arrangements. The organizations that are using AI for the Automotive fragment are:
  - MNC Automotive firms: Hyundai, Ford, Volvo, and Honda.
  - Homegrown firms: Tata Motors (Jaguar/Land Rover), Mahindra and Mahindra, Maruti Suzuki, TVS Motors.
  - Car Navigation and Mapping Technologies firms: Here Technologies.
- **AI in Telecommunication Industry** - The area incorporates Domestic Telecom suppliers, Reliance Jio Infocomm, Airtel, and Tata Communications, that are likewise creating AI answers for the 5G and existing 4G availability administrations. Computer based intelligence is embraced by the Telecom firms across the Telecom esteem chain and different industry use cases [2]:
  - Telecom Networks: Telecom firms are teaming up on AI in Core Networks with Network Equipment firms – Ericsson and Nokia.
  - Availability Solutions: AI in Telecom is embraced in Connected Cars, Smart Devices, Smart Homes, Private Networks, IoT Platforms, and Smart cities.

III. INDUSTRY 4.0

Arose in Germany around 2012, the conception of Assiduousness4.0 involves technological coinages in the fields of mechanization and information technology for manufacturing. Industry 4.0, which revolutionizes the robotization, monitoring, and analysis of pool chains through smart technology. Industriousness4.0 is powered by the Industrial Internet of Things (IIoT) and cyber-physical systems – smart, self-governing systems that use computer- predicated algorithms to watch and control physical paraphernalia like means, robots, and vehicles. Industriousness4.0 makes everything in your pool chain "smart" – from smart manufacturing and shops to smart warehousing and logistics. But Industry4.0 doesn't stop at the pool chain.

3.1 Pillars of Industry 4.0

With the introductory mark of creating fleetly, more flexible and operative processes, the fourth synthetic revolution promotes the union of physical and digital fund, connecting machines, and systems and substance in order to produce improved quality particulars at reduced costs. To achieve these results, it's necessary to induce a high rung of articulation between the main technologies that form the generalization, the so- called pillars.

A. Big Data and Analytics

Analysis and oversight of large quantities of data provides increased performance and optimisation of high processes, equalising energy consumption with product quality by handing a better reading of scripts and faster decision substance.

B. Robotics

By incorporating intelligent robots into sedulousness processes, the sector yield in performance and unattainability, leaving the prosecution of logistical and repetitious work tasks to the machines. In addition to reducing costs, these robots represent an important increase in work.

C. Simulation

In Industry 4.0, computer simulation is used in crude workshops to dissect data in real time, bringing the physical and virtual world closer together, and in refining machine configurations to test the succeeding product on the virtual work line before any real change, generating resource utilizatiion, better performance and other savings.

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D. Horizontal and Vertical Integration

Presently, not all systems are exhaustively integrated, with a lack of cohesion between company- clients and yea the labor process of an workplace lacks full integration. Industry4.0 proposes a better harmony between everyone who's part of the ecosystem, guaranteeing an integral governance of experience so that value chains are truly automated.

E. Internet of Things (IoT)

The Internet of Things(IoT) consists of the connection between a network of physical objects, climates, vehicles and machines by means of bedded electronic bent, allowing a fleetly and more effective collection and exchange of information.

F. Cybersecurity

The working environment of the coming demands that all areas of the company are connected, both commercial (IT) and mechanization and functional (OT) networks. So, it's essential that companies have robust cybersecurity systems to defend systems and information from possible hazards and failures that can bring derangement in fruit.

G. Cloud Computing

The number of tasks related to the fruit of goods and services in companies has grown more and more, demanding the use of exercises and data participated between different locales and systems beyond the limits of a company's server. Cloud based computing provides features that reflect an important reduction in cost, time and effectiveness in performing these tasks.

H. Additive Manufacturing

Also known as 3D printing, this pillar involves the thing of tract from overlying layers of material, normally in paint form, to procure a 3D model. This strategy can be used to occasion user preference products that offer construction benefits and complex designs.

I. Augumented Reality

Using the finances of this pillar, it's possible, for instance, to shoot assembly instructions via cell phone for the development of prototype neck and to use extended reality specs for the intendance and operation of certain machines, helping work procedures.

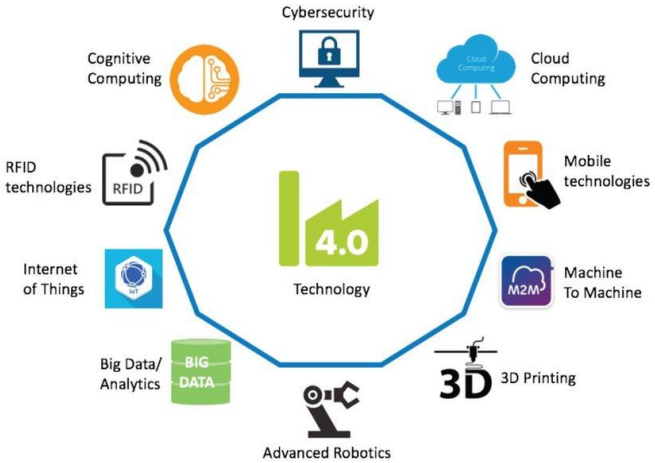

Figure 1: Pillars of Industry 4.0 [4]

Concepts	Examples
Big Data and Analytics	Handling and Managing large and complex datasets. For eg. Designing Algorithms.
Robotics	Humanoid or software programs capable of solving solutions , automating. For eg UI

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	path
Simulation	Modelling and simulating environment. For eg. Pilot training on simulated environment.
Horizontal & Vertical Integration	Integration of machinery for better optimization, For ex. Smart factories
Internet of Things (IoT)	Connection of hardware and software, For eg. Smart networks.
Cybersecurity	Cyber attacks to business surround. For eg. National defense systems in order to preclude attacks
Cloud Computing	Securing and storing data on servers , for eg. Meghraj an initiative of GOI.
Additive Manufacturing	Using 3d printing technology to manufacture mobile phones
Augumented Reality	Disney color books, pokemon go game.

Figure 2: Pillars of Industry 4.0

3.2 Challenges of Industry 4.0

- Low Job Creation: Job creation has not been adequate to assimilate the development in the quantity of individuals looking for occupations. Starting at 2016, there were nearly 198 million jobless individuals internationally who have been effectively looking for work
- Low quality Employment: Globally, almost 43% of utilized individuals were in own-account or contributing family work which is frequently portrayed by low compensation, familiarity and restricted government managed retirement.
- Pay disparity: ILO sees that in spite of the fact that laborers have become progressively gainful, the advantages of their work have progressively gathered to capital pay and to those at the highest point of the pay dissemination.
- Gender Gap: Though female workforce cooperation has expanded the sexual orientation pay hole stays a significant worry with ladies actually being paid 20% not as much as men.
- Advanced (Digital) Divide: Only 53.6% of all family units have web access. In arising nations, the offer is just 15%. Given the fast mechanical headways, advanced separation stays a vital test for ability improvement and business openings.
- Effect of Technology on Employment: There are fears that innovative advancement will prompt occupation annihilation. Robotization could be unsafe for work concentrated enterprises in India, for example, materials, money, development, cordiality, travel, the travel industry, media, gadgets, mining, agribusiness, transportation and amusement. The Indian ICT area is vulnerable to AI/robots supplanting laborers in its significant IT send out business sectors. The retail area, the biggest manager of lower expertise youth, is work shedding as e-retail quickens and human positions in coordinations, warehousing and conveyance administrations are being robotised.

3.3 Roadmap for the Future Prospects of Industries

A. Applications and Infrastructure Development

As in different nations, India can acquire essentially by the appropriation of AI innovation. The public authority of India must make framework to help advancement of AI applications. One basic framework is cloud which is required for the improvement of uses. Artificial intelligence applications require high computational force, huge memory and extra room which are accessible on the cloud .

B. Updating the Workforce on Bar With New Age Employability

To adapt up to the issues because of the deficiency of occupations, the labor force should be retrained to take up new kinds of occupations which may arise with the mechanization of the cycles. As individuals lose positions, they should be retrained and re-utilized by giving the essential preparing. For this, there is a need to investigate schooling and

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preparing foundation and re-adjust it with the necessities of the current day. like AI. The colleges and specialized training organizations should be upheld by the Government for inception of AI projects. There is a need to pull in splendid understudies to do research in the territory of AI.

C. Data Security Frameworks

On the off chance that AI-based applications/administrations are discovered to be more secure than human-based applications/administrations, more use might be allowed. On the off chance that it is discovered to be less protected, the utilization ought to be limited till the further improvement of innovation. Guidelines are expected to allow the utilization of AI in the basic areas like medical care where the self-governing frameworks are required to counsel on the finding and treatment which may influence the recuperation of the patient.

D. Research and Development

Government has a significant task to carry out in financing R&D and development projects. The vast majority of the created and a few non-industrial nations are putting vigorously in R&D and development in the AI sectors. India needs to start a Program to help R&D and advancement around there. Contribution of industry is fundamental while subsidizing R&D projects. A serious issue looked in India is that the R&D results don't prompt business items.

The primary explanation of the present circumstance is the nonappearance of connection between the R&D focuses/scholastic organizations and industry. To get the contribution from the business, it is important to hold conversations with them through standard workshops/gatherings. Industry affiliations can play a part in this matter. They can give a combined perspective on the organizations on the issues

E. Further Blueprint

India has an exceptional chance right now. Utilizing the ability accessible inside the nation, it can rehash the example of overcoming adversity of IT industry. Simultaneously, if essential advances are not taken in time, it will lose the chance. Artificial intelligence can help in the significant projects of the Government [7]. All together to quicken improvement of AI innovation and its applications, it is important to make strides for Applications and Infrastructure Development, Policy and Regulations, Research and Advancement and Human Resource Development.

IV. Present Status of AI Startups in India

A few new companies mushroom in the AI, ML, large information and cloud space which are drawing in the premium of financial backers, a critical number of whom offer items and administrations in medical care, Fintech, client services . This is additionally impelled by the government's leader activities of Make in India and Startup India. More modest and agile startup associations are presently turning out to be intense challengers to the current market pioneers through development and the reception of fresher advances. This shows extraordinary potential for AI/ML development in India. Enormous IT service operators sectors are now concocting their AI stages, while more modest specialty AI new businesses are following explicit issues, in this manner making an all encompassing biological system for AI to flourish in India.

Computer based intelligence new businesses in India are wandering into various ventures, for example, online business, medical care, schooling, and monetary services, and retail sectors. New companies gaining practical experience in AI, ML and mechanical technology have contributed essentially to advancement in these fields throughout the most recent couple of years. Advanced innovations have made openings and permitted them to set up new income streams around these new innovations. These new businesses and little and medium-sized endeavors (SMEs) can become providers of complete arrangements which are either independent or coordinated applications which can be embraced by organizations and purchasers.

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V. USE CASES OF AI IN INDIAN INDUSTRIES

5.1 AI driven Cybersecurity and Privacy Concerns

Artificial intelligence driven network safety and protection identifies with viewpoints, for example, digital danger recognition. It commonly includes noticing the organization foundation and identifying dangers of cyber attacks continuously[2]. It additionally frequently incorporates such exercises as organization traffic investigation, , malware attacks, and so forth Artificial intelligence controlled digital danger discovery is frequently important for a bigger network safety arrangement that likewise utilizes various anticipation measures (e.g., firewalls).

5.2 Physical Security Threats

Observation and actual danger discovery involves ongoing surveillance (present in physical sites) of assembling locales or laborers to consequently identify actual security dangers as well as potential wellbeing risks.

5.3 Data Management and Security

With data frequently put away in numerous frameworks and different spots, it is difficult to get to and examine the data rapidly and comprehensively. Along these lines, some modern organizations begin to utilize data the executives arrangements that perform operations, for example, data integration, data acquisition (converting different samples into digital numerics for computer manipulation), data cleaning and filtering so on progressively [5].

5.4 Digital Assistance and Chatbots

Voice partner is one of the instances of smart guidance chatbots in manufacturing sectors [4]. Coordinating voice collaborator innovation into its ongoing mechanical observing frameworks permits laborers to acquire bits of knowledge without coding the unequivocal orders or printing long status reports.

5.5 AI-Driven R and D

Computerized segment configuration(Automated unit designing) is the main use case in AI-driven R&D. The objective: Letting programming freely create many various plans in brief periods, given a bunch of predefined imperatives. The ideal plan is picked a while later. For this assignment, advanced twins and reenactments frequently supplement the AI strategies [1].

VI. CONCLUSION

India has a special chance to apply the innovation to tackle a portion of its most serious issues for example, lack of medical services office, bad quality of training, and so forth It is preposterous to expect to meet the objective of giving great medical services or quality training utilizing customary techniques. Artificial intelligence gives a choice to accomplish the equivalent. The paper studied the public about Industry 4.0 and various use cases of AI in driving the technological sector ahead. India, which includes framework improvement, strategy, guidelines, and human asset advancement. All the partners need to meet up to talk about on these issues. Government has a significant task to carry out in framework improvement, applications in open area, strategy and guidelines, innovation advancement and HRD. Notwithstanding, these can be effectively finished with the help from industry. In spite of the fact that the report has drawn out the significance of AI in Indian enterprises, it is important to initiate a few examinations to gather the exact data for choosing the means on foundation improvement, development of administrative systems, and innovation improvement, and so forth.

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