INFLUENCE OF ARTIFICIAL INTELLIGENCE ON INDUSTRY 4.0

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Abstract

Artificial intelligence refers to the stimulation of human intelligence in the machines that are programmed to think like humans and mimic their action. As artificial intelligence main aim and goals which includes learning, reasoning and perception. There is a large influence of artificial intelligence in industry 4.0, from working process to manufacturing process artificial intelligence has acquired special place. There are abundant of questions that after arriving of the artificial intelligence, there will be huge impact on employment. This report begins with a reflection on what constitutes of Artificial Intelligence and concludes with recommendations concerning AI-related policy. These recommendations include accruing technical expertise about AI in government and devoting more resources and removing impediments - to research of the fairness, security, privacy, and societal impacts of AI systems. The study panel has said that there is threat to humankind, due to artificial intelligence. There is major scope and increase in the future uses of AI applications, including more self-driving cars, healthcare diagnostics and targeted treatment, and Physical assistance for elder care can be expected.

Keywords: *Artificial Intelligence, Impact, Applications of AI, AI, self-driving*

Artificial Intelligence – Conceptual Overview

As we all know that humans are the most intelligent creatures .overcoming these all-new modern technology has been introduced is Artificial intelligence. In computer science terminology, mainly AI is also called machine Intelligence. The main goal of AI is to think of machines as Intelligent and independently. Till now our intelligence system built and also based on the complex mathematical formulas and derivatives. Artificial intelligence has machine learning and machine learning has deep learning everyone has their own specialty such as Machine Learning which can provides a machine with the capability to learn data and experiences through algorithm and also through Deep Learning.

Types of Artificial Intelligence

Artificial intelligence mainly consists of three types they are:

i. Narrow AI: this narrow AI is a normal task manager, it cants do multi-tasks. So it called narrow AI and also called as week AI.

ii. General AI: this AI is like humans it can do; multi-tasks like humans, present most of the scientists are working on that to give better and better.

iii. Strong AI: this is AI which is more powerful and intelligent than humans. They think more than humans, they still not exist and they need much more effort to make it.

3. Applications of Artificial intelligence:

Emerging applications of Artificial Intelligence include:

1. Through artificial intelligence and machine learning, we can detect the facial features of living organisms.

2. Deep learning also used to detect every minute detail from the given image.

3. Self-driving cars are introduced; this is mainly based on artificial intelligence.

4. Astronomers also used to sift through years of data obtained by the Keller telescope to identify a distant eight planet solar system.

5. Even in the banking sector also, through Electronic virtual assistance(EVA) it has addressed over 3 million customer queries, interacted with over half a million users and also held over a million conversation.

6. In the marketing sector, using AI & Machine learning recommendations is giving more to the customers. Through that companies' profits are hiking.

7. Health care, through Google deep minds, has successfully developed a system that came to analyze scans and spot symptoms of sight treating eye diseases.

8. Agriculture, by proper use of artificial technology it uses resources more sustainably .also it monitors and precisely sprays weedicide on plants.

4. About industry 4.0:
As in the previous revolution like innovation, manufacturing and system programming. The advancement of the industry 4.0 will be driven by smart interconnect province environment. This completely on connectivity with good intermediate technology. Assembling of the various technologies with bounded good secure connectivity. Mainly there are the four type of revolutions are been progressed so far. These include:

First industry revolution: this is seen in the 18th century where all the works are done by steam power. This is the innovations is being started.

Second industry revolution: this is the revolution which is started in the 19th century. In this century there are lot of changes are started as the introduction of electricity and started mass production.

Third industry revolution: this revolution was started in the 20th century. This time is called programmable time. Where all the computer systems and electronic gadgets were introduced. The introduction of entire programming and coding was started at this time.

Four industry revolution: according to many of the analysts this revolution was already started. This is the revolution where all the data is interlinked and connect to one another. This is the era of the introduction of Artificial intelligence, machine learning, deep learning, block chain, internet of things (IoT), industrial internet of things (IIOT) and many more technologies were introduced.

According to the Klaus Schwab "Technological revolution that is blurring the lines between the physical, digital and biological spheres".

The Cyper Physical system, embedded technology to human interventions, internet of things and networks have made strong hold and one of the key developments that has been contributing to Industry 4.0 is Artificial Intelligence. Especially for Industry 4.0, the Artificial Intelligence has been playing pioneer role in terms of its impact associated with various industrial needs. According to Microsoft analysis on Artificial Intelligence for business needs, the following areas are identified where Artificial

Intelligence is expected to play a critical role in Industry 4.0.:

a.   Maintenance and direct automation of physical processes

b.   Quality enhancement beyond the limits using Refined root cause analysis

c.   Collaborating human robot integration for increased productivity

d.   Generative design and augmented realty and increasing efforts on safer workplace.

e.   Automated quality control, low operational costs

f.   Predictive maintenance and quick decision making

g.   Testing and quality optimization and better demand forecasting

h.   Market adaptation and supply chain system management

i.   Reduction of industrial and man hours wastage

j.   Optimization of production.

5. Review of Literature
A brief review on the existing literature pertaining to Artificial Intelligence is presented below.

Adrin Skrop (2018) agreed that the expectations are high for the commercial utility of system studying. Meeting the requirements is an actual project to business companions. Among the many demanding situations, the subsequent ones are crucial. On the only hand training algorithms require plenty of easy, bias unfastened records sets, otherwise the result of the education would be incorrect. On the opposite hand, cyber security is another hazard that needed to think about with the increasing use of linked technologies.

Ravi Singh (2018) found in his study that Computerization and automatic business strategies cross hand-in-hand. Their confluence is carried out via the proper combination of hardware and software. Artificial intelligence and machine learning techniques are also applied heuristically. The destiny of the industry is visualized as a combination of refined machines and adaptive software program. Both these critical components are plugged right into a grid or framework.

Big data analytics and cloud computing architecture make certain flexibility and scalability. Businesses can refine production processes through the usage of the "mastering with the aid of example" method. Predictive analytics help in sharpening commercial enterprise intelligence. Profits may be invested in the contemporary embedded infrastructure. Operations can be scaled up without compromising the best of communications or gadget remarks.

Dr. A.Narasima Venkatesh (2018) found that Insightful technological advances are disrupting traditional techniques of working and stimulating drastic changes in productivity. Today, Artificial Intelligence, Virtual Reality, Machine Learning and different cutting-edge technologies are used in lots of industries to growth productiveness and to lower the fees. More advancement is trending in Artificial Intelligence discipline and it will virtually play an inevitable role in numerous industries in close to destiny for the possibility of its wide form of packages in numerous industries. Thus, Artificial Intelligence (AI),

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Machine Learning and other cutting-edge technology are disrupting conventional strategies of work and creates a whole lot of opportunities to reimagine and redesign as to how and whilst any paintings wishes to be accomplished in diverse industries.

Jay Lee, Hossein Davari, Jaskaran Singh (2018) said that As AI emerges from science fiction to end up the frontier of global-changing technology, there is an urgent need for systematic development and implementation of AI to look its actual impact in the subsequent generation of industrial structures, specifically Industry 4.0. This study pursuits to define the term Industrial AI and put it into the angle of Industry 4.0 paradigm. In addition, by using imparting an overview of the Industrial AI eco-system in today's manufacturing, this paper pursuits to provide a guiding principle for strategizing the efforts closer to cognizance of Industrial AI systems.

Katarzyna Nosalska and Grzegorz Mazurek (2019) Stated that all 5 marketing standards now not only intertwine by the present aspect of connectivity. They additionally shape a holistic concept of creating progressive and powerful advertising and marketing tools in the times of the Fourth Industrial Revolution. If contemporary corporations show their ability to adopt these rules as recommendations to plan their innovative marketing strategies, this move will provide them a completely unique and new perspective for standing out and building greater lengthy-term aggressive advantages that should result in even greater business achievement within the modern-day digital commercial enterprise atmosphere.

The supplied conceptual framework highlights the area and course of in addition studies in the field of advertising in the context of the development of Industry 4.0 that could enhance the prevailing scientific literature with new views for better information of the emerging modifications introduced through virtual transformation.

6. Objectives and Methodology

The core objective of the paper is to evaluate the role of Artificial Intelligence to Industry 4.0. More specifically the study concentrates on the influence of Artificial Intelligence for various company needs in the present Industrial revolution.

The study is based on secondary data sources. The required data is collected from the reviews basing on Artificial Intelligence in general and in particular to Industry 4.0. Further, the study evaluates the reports of McKinsey on adoption of Artificial Intelligence and Harvard Business Review on TCS study on Artificial Intelligence in select companies.

7. Results and Discussion

According to Narrative Science Report, 2016, majority of the users have been depending on predictions on activity related to machines, customers or business health. This includes 38 percent of the total dependence. For automation and repetitive tasks, 27 percent of the businesses have been depending on Artificial intelligence. For monitoring and alerts of business, a total of 14 percent is depending on Artificial intelligence. For increasing quality of communication with customers, a total of 10 percent are depending on Artificial intelligence. And less than 10 percent are depending for recommendations related to HR issues and other cases.

Artificial intelligence plays a major and key role in every industry .day by day by using artificial intelligence in every industry makes the task more and easier and efficient. Comparing to the previous past years, present through the work sales and production increases.

Table-1

Applications of Artificial Intelligence usage for Industrial needs

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Sl.No.	Application	Percentage of usage
1.	Detecting and deterring security intrusions	44%
2.	Resolving users' technology problems	41
3.	Reducing production management work by automating it	34%
4	Gauging internal compliance in using approved technology vendors	34%
5.	Gauging internal compliance in using approved technology vendors	34%
6.	Using runbok automation	16%
7.	Anticipating future customer purchases and presenting offers accordingly	19%
8.	Improving media buying	16%
9.	Monitoring social media comments to determine overall brand affinity and issues	16%
10.	Tailoring promotions (online and offline)	15%
11.	Financial trading	17%
12.	Automating call distribution	15%

Source: Tata consultancy services survey report, 2017

As per the survey report organized by Tata Consultancy services on an 835 companies functioning in Customer Services, Finance and Accounting, Marketing and Information Technology, an attempt is made to evaluate how companies around the world are using artificial intelligence. Around 44 percent of the companies are using AI for detecting and deterring security intrusions. Approximately 41 percent of the companies have been using AI for resolving users' technology problems. For reducing the burden of manual processes and updating to automation, 34 percent of the companies have been using Artificial intelligence. Using run book automation, 16 percent of the companies have been using AI. Apart from these needs, especially in marketing, for improving media buying, social media tracking, tailoring promotions, financial trading and automating call distribution, the artificial intelligence has been contributing hugely to modern industrial setups.

8. Analysis on Microsoft's AI Maturity Model
Microsoft Company has incorporated the Artificial Intelligence by formulating a model that describes AI Maturity model concentrating on the following four stages of maturity of the emerging companies in adoption of artificial intelligence.

Table-2
Microsoft's AI Maturity Model

Stage Category	Key Area	Transformation of knowledge	Characteristics

I	Fundamental	No prior knowledge exist on AI	Lacking of analytical skills for problem solving, low digitalized business practices
II	Approachment	Desire to get approach to Artificial Intelligence	Introduction to digitalization, unwanted disruption, desired optimization processes
III	Aspirations	Better experiences with AI	Increased digitalization, new formulation of business models, data driven
IV	Maturity	Enhancement of data and creativity skills for modern industry needs	Monetizing of digitization, adoption of AI to strategy formulation and implementation, adoption to wider business fields and learning exceptional expertise on Artificial Intelligence

Source: Report on Artificial Intelligence in Europe, Outlook and Beyond Magazine, 2019.

9. Analysis on McKinsey Report on Artificial Intelligence

McKinsey organization has conducted survey on select companies functioning in internal level. These include Telecom, High-Tech, Financial Services, Professional Services, Power producing companies including Natural gas producers, Healthcare Services, Automotive and Assembling units, Travel, transport and Logistics developers. A total of 8 key areas are identified and the area wise utilization of Artificial intelligence by the select company categories are identified and presented in the report.

For the industry 4.0 expectations, the best alternative solution in many cases is been provided through artificial intelligence. According to McKinsey Global Survey(2017), the artificial intelligence provide the needed ability of an artificial setup or machine to perform integrity between human expectations and skills to machine capabilities to result in wide range of responsibilities which are required to be done for managing industry expectations from business organizations. Some of the insights from the report are presented here.

1. 21 percent of the total sample companies selected for the survey have opined AI is been embedded in several functions of business needs.

2. 30 percent of the companies are piloting Artificial Intelligence.

3. 47 percent of the companies have embedded at least one core service using AI.

4. 20 percent of the companies have been completely embedded with AI for all core business activities.

Detailed analysis of adoption of Artificial intelligence by the companies is presented in table-2. Results

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shown in table-2 clearly reveal that, the service operations is the most adopted area for Artificial Intelligence, followed by Product/Service Development where 306 respondents have expressed that they are adopting Artificial Intelligence. A total of 220 respondents have opined that they are adopting for Marketing and Sales, followed by Manufacturing where 140 respondents have supported and 139 respondents adopted for Supply chain management, risk adoption is integrated through artificial intelligence by 134 respondents, 106 respondents have adopted for the management of human resources and 93 respondents have adopted for strategy formulation and corporate finance.

Table-2
Adoption of Artificial Intelligence by the Select Companies

Sl. No.	Category of Company	Category of Service							
		Service Operations	**Product/Service Development**	**Marketing and Sales**	**Supply-chain management**	**Manufacturing**	**Risk**	**Human Resources**	**Strategy and Corporate finance**
1.	Telecom	75	45	38	26	22	23	17	15
2.	High Tech	48	59	34	23	20	17	21	17
3.	Financial Services	49	26	33	7	6	40	9	14
4.	Professional Services	38	34	36	19	11	15	16	11
5.	Electric Power and natural gas	46	41	15	14	19	14	15	14
6.	Healthcare systems and Services	46	28	17	21	9	19	18	13
7.	Automotive and Assembly	27	39	15	11	49	2	8	6
8.	Travel,	51	34	32	18	4	4	2	3

Transport and Logistics								
Total	380	306	220	139	140	13 4	106	93

Source: McKinsey Report on Adoption of Artificial Intelligence, 2018.

10. Conclusions:

The industry 4.0 has been a revolutionary in the industry based world development. Right from mechanization and utilization of steam power and other tools in industry 1.0, the era of Industry 4.0 completely revolutionized the system beyond the expectations.

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