
AI Automation: Next Industrial Revolution

Sushma Malik*
Anamika Rana**

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Abstract

The expansion of artificial intelligence is speeding up rapidly and its combination with automation has modified the working of business in companies. Business models are modifying the AI implementation for automation. Companies are trying to apply the AI with automation processes to expand the business and also increase the efficiency and quality. In the fourth industrial revolution, the main idea to define the tools in this new era and manufacturing always end with the concept of smart machines that would be able to communicate with each other and also with the environment. For achieving the benefit from tools and applications, develop the smart embedded systems that are able to perform the autonomous tasks. It can be easily implemented by using the theory of AI, where a large amount of data is accessed from a number of sources and filtered which help to interpret and also suggest the most recommended course of action. Only for that reason, AI perfectly suited for the fourth industrial revolution. The paper represents AI and automation and also tries to demonstrate how both AI and automation are related. Also describe the effectiveness of AI and automation when they work together.

Keywords: *AI, Automation, monotonous task, Internet of Things(IoT), Machine Learning*

* Assistant professor (IT), Institute of Innovation in Technology and Management, Janak Puri, New Delhi.
sushmamalikiitm@gmail.com

** Assistant professor (IT), Maharaja Surajmal Institute of Technology, Janak Puri, New Delhi.
anamika.rana@gmail.com

Introduction

The rising technologies like the internet of things (IoT), data science, cloud computing, big data, artificial intelligence (AI), and blockchain are revolutionizing the way human beings live, work and amuse. These technologies contribute to automation and connectivity and bring us at the dawn of the Fourth Industrial Revolution or Industry 4.0 (Soni, Sharma, Singh, & Kapoor, 2019). AI is the heart of the enhanced performance of all other technologies and the evolution of Industry 4.0.

AI is the branch of computer science that facilitates the machines and computers to learn and perform the task. The demand of AI is increasing day by day because it's able to resolve the complex problem with limited usage of human resources and within the limited time period (Shekhar, 2019). AI transforms the lifestyle and living standards of the human being.

With the adoption of AI, the world has become smarter and innovative. AI plays an important role in everyone's life. Price estimation of rides by cabs, spam filters in emails, recommendation of products on online shopping, mapping of route and traffic by Google maps and detection of cancer and other diseases are some examples of AI which simplify the human life and get better living standards (Soni, Sharma, Singh, & Kapoor, 2019).

Nowadays, AI is commonly used in a number of industries and business domains may be no business is left which is not affected by AI. Its implementation can be observed in healthcare industries, manufacturing to law, education and many more. With the implementation of AI, doctors diagnose the diseases faster than before. In law industries, AI has made it easier for lawyers to go through large legal documents and find them accurately which is a real tedious work in general. In the education domain it provides the grade to the students on the basis of their performance and helps them to provide them on track. Robots developed by AI in industries have made the manufacturing process more easy and efficient (Shekhar, 2019).

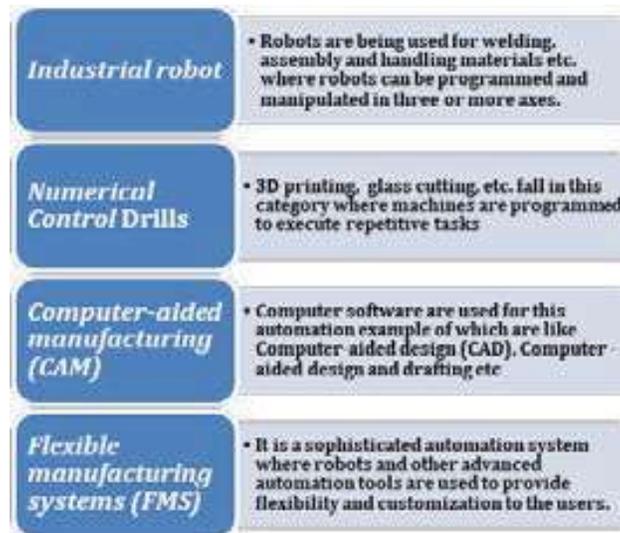
Concept of Automation

Nowadays, humans demand more and more automation because the development of hardware and software replace the human task into automatic and make people feel more convenient (Liu, 2018).

The main aim of automation implementation is to reduce manpower and time.

With the use of automation, highly concentrated and repetitive tasks have become efficient and quality of the product also increased in different trades. There are various types of automation; (Shekhar, 2019) a few of the well-liked as:

Figure 1: Types of Automation



Automation usually follows the pre-programmed ‘rules’. Its main motive is to have machines perform monotonous tasks and make humans free to solve some multifaceted works. Automated dishwashers, human command working devices like Siri and Alexa are examples of the application of automation (Evans, 2017).

Differences between Artificial Intelligence (AI) and Automation

In daily life, both terms AI and automation are used interchangeably. Both terms are associated with physical or software robots along with other machines to work effectively and efficiently. But people fail to realize the big differences between these two terms. Some differences are listed as:

1. **Terms of difference:** AI means making the machines more intelligent or even trying to suppress human intelligence and behavior. In another way, automation means making software or hardware which is capable of performing tasks automatically without any human intervention.
2. **Data:** All types of automation which was used by human beings is bound using explicit programming and rules. Whereas in AI, large amounts of data using neural networks, graphs and deep learning must be put in the software. Programmer

coding level decides how much a system will stimulate like a human. In case of automation, humans easily predict the output by using the sensor readings but in case of AI, there is uncertainty in output, just like it's there with the human brain (Shekhar, 2019).

- 3. Purpose:** The purpose of automation is to execute repetitive tasks and make the human free to perform another task which requires rational judgment and thoughts. Whereas the purpose of AI design is to learn from experience, so AI implemented machines can self choose the suitable answer according to the situation demand (Shekhar, 2019).

Combination of AI and Automation

The implementation of software to reduce the human efforts is not new news in the business environment. Automation process reduces human work at a limited rate. But AI opened a new possibility in the business domain for automation. By combining AI with automation it will be able to reduce not just human efforts but also develop the smart and intelligent machines. This type of combination is known as automation continuum or Robotic Process Automation (RPA).

Major Components of AI in Automation

AI has a number of components which are used for automation. So, on the basis of requirements these components are either combined or used separately to implement the fully automated response.

- **Machine Learning (ML):** ML can be depicting set techniques that normally used to resolve the number of real world problems with the usage of computer systems (Kühl, Goutier, Hirt, & Satzger, 2019). Efficiency to solve the current problems will increase with the usage of ML.
 - **Natural Language Processing:** It is an interdisciplinary field whose main aim is to understand and analyze the human natural language (Jothilakshmi & Gudivada, 2016). It combines linguistics and AI to enable the computer to understand the human's natural language as input and provide the output on that basis (Krishnan & Rogers, 2015). Apple's Siri, Amazon Alexa are some examples of that which is used in our daily life.
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- **Machine Vision:** This refers to the capability of a program to analyze and understand the visual inputs. The machine (computer) uses the training data or images for the base of identification and classification of input data or image (Shekhar, 2019).

Current Applications of AI Automation

AI is the collection of influential programming techniques studying the nature of intelligence by developing computer systems and using this concept to solve the real world problems.

Automation and artificial intelligence (AI) are changing the way of living and working of organizations to improve their financial profitability. Here some major ways are listed in which human being and organizations will be able to take benefit from the combination of AI and Automation:

Preventing Fraud: The camera will be attached to the point of sale (POS) systems to record all types of transactions. And then link them directly to the data which are already present in the system. After implementing the AI, the system becomes intelligent and easily finds the abnormal behaviour from the user side and also prevents cyber attacks. In that situation, an intelligent system automatically stops responding to response on input and also provides an alert message to the actual user or administrator (Shekhar, 2019).

Home Automation: Home automation is today's prospective and emerging technology. The main aim of home automation is control the home appliances, their management and co-ordination in a efficient and protected way (Kumar & Qadeer, 2012). This system provide the large number of services like management and remote controlling of home appliances, efficiently utilization of home resources and also enhancing the home security (Kumar & Qadeer, 2012).

Siri and Alexa: Siri and Alexa , both are computer programs that work as an intelligent personal assistant. With the help of machine learning, they get smarter and start to understand the natural languages of the users and also work on the commands. They perform a number of tasks like sending the message to a particular number, play calls and also songs on the basis of commands (Kour & Gondhi, 2017).

Software Testing and development: Implementation of automation in software testing and development is a very developing domain. Some examples which are used in this domain are like ReTest, Applitools, SauceLabs and much more. With the help of these

tools, developers can only focus on doing the core coding and testing and leave the fixing of bugs on that intelligent system (Shekhar, 2019).

Agriculture: AI technology is emerging technology which is used to improve the efficiency and remove the barriers in the agriculture field. AI developed robots are becoming very usable in the agriculture domain. These robots are performing the essential task of agriculture like harvesting at large areas and faster as compared to man power. Smart computers are also developed with computer vision and deep learning algorithms to analyze the data which is captured by drones or software based technology to monitor the crops and also soil nutrients. Machine learning models are developed to predict the environmental impact on crop yield like weather change (Sennaar, 2019)

Education: AI is very useful in the education domain. It is used in automated grading systems. These kind of intelligent systems help the faculties to monitor the students performance and also enables them to modify the mode of instruction to the students. With the usage of AI, teachers become the facilitators by providing students interactive learning experience. AI supports the students in their learning process by providing the assistant for their improvement by trial and error method (Sharma, 2017).

Human Resource Management: In any domain, recruiters face a lot of problems to sort the CV's which get online. After implementation of automation, smart systems will be able to identify the potential candidates. Now mostly companies and organizations are using the automated applicant tracking system to receive the CV's of applicants (Shekhar, 2019).

AI Glasses: It is the great implementation of AI especially for the user's suffering from autism. Autism suffered children are not able to identify their emotions through facial expressions. Whenever users want to use it, simply wear it on their eyes. The smart glass has a front facing camera which uses machine learning and AI algorithms to identify the expression of other users. This wearable glass is connected with the Smartphone with application and professionals can easily check the improvements in capability to identify the emotions of the users (Kour & Gondhi, 2017).

Disadvantages of Process Automation

- **Cannot perform complicated or non-repetitive tasks:** Automated machines are programmed and they are only able to perform the programmed task. These machines have no brain to perform the variety of tasks (Tamboli, 2016).
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- **High initial investment:** Initial cost for setting up the automated machines is very high because automated machines are using the latest hardware and software and technology (Tamboli, 2016).
- **Require Training and maintenance:** For the usage of automated machines, workers should be well trained. So proper training is required for the proper usage of machines for high quality results. Automated machines also need the proper maintenance (Tamboli, 2016).
- **Unemployment:** After the implementation of automation, unemployment has increased and it is also going to continue because organizations have adopted the automation.

Conclusion

In the end we can conclude that the AI and Automation which is considered to be the 4th Industrial revolution will be the future of this world and it does have the potential to take over every aspect of life. And whereas it's making life easier for the humans, it is also overthrowing us from various jobs which could lead to a huge amount of unemployment which will be shown on the economy of the country.

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