Automation 2.0: The impact of artificial intelligence

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AUTOMATION 2.0: THE IMPACT OF ARTIFICIAL INTELLIGENCE

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ABSTRACT

Automation has been a key driver of productivity and efficiency in various industries, but the advent of artificial intelligence (AI) has taken automation to the next level. Automation 2.0, as it is often referred to, combines traditional automation technologies with AI and machine learning to create a new generation of intelligent automation systems. These systems can learn from data, adapt to new situations, and make decisions autonomously, enabling them to perform tasks that were previously impossible or impractical. The impact of AI on automation, highlighting the benefits and challenges of this new generation of automation systems. We discuss the ways in which AI is being used to improve the efficiency and effectiveness of automation, including the use of machine learning algorithms to optimize process control, the integration of AI-powered sensors and actuators, and the development of autonomous systems that can operate independently. We also examine the potential applications of Automation 2.0, including the use of AI-powered robots in manufacturing, the integration of AI with industrial control systems, and the development of autonomous vehicles and drones. Finally, we discuss the challenges and limitations of Automation 2.0, including the need for high-quality data, the potential for bias and error, and the need for ongoing training and maintenance.

Keywords: Artificial intelligence, Automation 2.0

I. INTRODUCTION

"Artificial Intelligence" (AI) and "Automation" are frequently used interchangeably, often leading to confusion regarding their distinctions and applications. While both AI and Automation play significant roles in shaping the future of work and technology, they represent distinct paradigms with unique capabilities, goals, and applications.

Artificial Intelligence, often portrayed in popular media and science fiction, refers to the simulation of human intelligence by machines. AI systems are designed to mimic human cognitive functions such as learning, reasoning, problem-solving, and decision-making.

Through the use of advanced algorithms, data analysis techniques, and machine learning models, AI enables machines to perceive their environment, interpret data, and make autonomous decisions with varying degrees of complexity and adaptability.

Automation involves the use of technology to perform tasks and processes without human intervention. Automation systems streamline workflows by executing predefined instructions and rules, eliminating manual effort, reducing errors, and increasing efficiency. While Automation does not possess the cognitive capabilities of AI, it excels in automating repetitive, rule-based tasks across various domains, including manufacturing, logistics, finance, and customer service.

Aim to clarify the distinctions between AI and Automation, providing a comparative analysis of their key characteristics, functionalities, and applications. Through a comprehensive examination, we seek to elucidate the unique roles and contributions of AI and Automation in shaping the future of work, technology, and society. By understanding the differences between these two paradigms, organizations and individuals can better harness their respective capabilities to drive innovation, optimize processes, and achieve strategic objectives in an increasingly digital world.

2. CONCEPT OF AUTOMATION

The utilize of mechanization started [3] to extend within the final decade with an point to decrease labor and time. Computerization has presented a framework of computer and machines and supplanted a framework that was built by combining man and machine. Profoundly strongly and tedious assignments have gotten to be productive and the item quality has moreover expanded with the utilize robotization in different businesses. There are different sorts of automation, a few of the well known ones are as takes after-

2.1. Numerical Control Drills,

3D printing, glass cutting, etc. drop in this category where machines are modified to execute monotonous errands.

2.2. Computer-aided fabricating (CAM)

Computer program are utilized for this computerization case of which are like Computer-aided plan (CAD), Computer - helped plan and drafting etc.

2.3. Adaptable fabricating frameworks

It may be a modern mechanization framework where robots and other progressed computerization apparatuses are utilized to supply adaptability and customization to the clients.

2.4. Mechanical robot:

Robots are being utilized for welding, gathering and taking care of materials etc. where robots can be modified and controlled in three or more tomahawks.

3. DIFFERENCES BETWEEN ARTIFICIAL INTELLIGENCE (AI) AND AUTOMATION

Before we get too deep into AI in automation, let's remember that we use these terms interchangeably in everyday life. They refer to robots that can be physical or software, as well as other machines that help us do things more efficiently. This could be something like putting together a car, or sending a follow-up mail to a customer the day after they haven't finished their order. But people don't realize that there are big differences between the two systems. These differences are based on the complexity of the system.

• Terms of Contrast: Automation,[9] fundamentally implies making a computer program or equipment which is able of naturally doing things which as well without any shape of human intercession. Manufactured insights on the other hand could be a science as well as building which is included in making machines which are cleverly. AI is almost endeavoring to form machines imitate or indeed attempt to supersede human intelligence and behavior.

• Data: Computerization may or may not be based on artificial intelligence. The complete hone of [4] mechanization has advanced into its current shape between the primary and third mechanical insurgency. It includes generation utilizing programmed testing, mechanical labor, control frameworks, computers and working equipment's. All the sorts of automation which has showed all around us are bound utilizing unequivocal programming and rules. To guarantee that the same thing gets to be an AI, [10] all that's required to be done is to control it up utilizing data. Huge amounts of data, like utilizing neural systems, charts and profound machine learning must be put within the program. Your coding levels will certainly choose fair how much you'll be able to form your framework fortify like a human. But most likely, you'll be educating the framework all simply already know. In case of programmed, you may be able to effectively know the yield utilizing sensor readings. But in case of AI there's continuously a small bit of instability, a bit like it's there with the human brain.

• Purpose: Robotization can execute tedious errands. This frees up profitable time [5] for people to require up more vital assignment which require rational judgment and thought. This makes the full thing more productive and taken a toll compelling. Counterfeit Insights is outlined to not fair look for designs but moreover to learn from encounter so that they can self-select the suitable reactions agreeing to circumstances.

Table 1: Differences between AI and Automation

Aspect	Artificial Intelligence (AI)	Automation
Definition	AI refers to the simulation of human intelligence by machines.	Automation involves the use of technology to perform tasks without human intervention.
Goal	The goal of AI is to enable machines to mimic human cognitive functions such as learning, reasoning, and problem-solving.	Automation aims to streamline processes and tasks to increase efficiency, reduce errors, and save time.
Decision-making	AI systems can make decisions based on data analysis, algorithms, and predefined rules, often exhibiting adaptive behavior.	Automation typically follows predetermined rules and instructions programmed by humans, with limited decision-making capabilities.
Adaptability	AI systems have the capability to learn from data, adapt to new situations, and improve performance over time through machine learning techniques.	Automation systems are generally static and do not possess learning capabilities, remaining unchanged unless reprogrammed by humans.
Complexity	AI systems are capable of handling complex tasks and problem-solving scenarios, including those with uncertain or ambiguous conditions.	Automation is well-suited for repetitive, rule-based tasks with clear input-output relationships, but may struggle with complex, unstructured tasks.
Examples	Examples of AI include virtual assistants (e.g., Siri, Alexa),	Examples of automation include robotic process automation (RPA),

	autonomous vehicles, recommendation systems (e.g., Netflix, Amazon), and chatbots.	industrial robots in manufacturing, automatic email responses, and automatic bill payments.

Can AI and automation really work together?

It's not a new idea for businesses to use software to cut down on human effort, but AI and automation have opened up a whole new world of possibilities. Automation can only go so far when it comes to reducing human work, but if you combine AI and automation, you can reduce not only human effort, but even completely eliminate it. This type of automation is called automation continuum (also known as intelligence robotic process automation).

What Are the Major Components of AI in Automation?

Artificial intelligence can be used in three different ways in an automation system. Depending on the requirements, they can be used together or even used independently to create a fully automated response.

Machine Vision: This is the ability of any program to recognize what the visual data is. The machine uses the training data (an image) as a basis for identification or classification. For example, the face recognition system of the iPhone X uses machine vision technology.

Natural Language Processing: The machine world works on the visuals. NLP does the same thing for understanding human voice and text. It is possible for machines to recognize what the context of the communication is and then take action based on the type of data and contextual variables that are present. Examples of this are Apple's Siri and Amazon Alexa.

Machine Learning:It is a technology that enables machines to learn from the data they are given. This includes the results of environmental variables and decisions that the machine can make to enhance itself. By utilizing machine learning, it is possible to increase the overall effectiveness of existing solutions. For example, if an issue is encountered and human intervention is necessary to resolve it, the machine will automatically follow the same set of procedures that a human would have used. This will result in a decrease in human effort and an increase in system efficiency.

What Are the Important Applications of Artificial Intelligence in Automation?

Artificial Intelligence can be used [8] in various ways in Automation. From drones to self-driving cars, all are making use of intelligent automation. Here are some of the major ways in which a business will be able to benefit from a combo of AI and automation:

Automation can be used to reduce the risk of fraud by linking the theft to the individual responsible. A camera attached to the point-of-sale system can be used to capture all types of transactions, which can then be linked to the individual's face with the information already stored in the system, making it easier to apprehend them.

Additionally, intelligent systems can be used to detect cyberattacks by quickly alerting the administrator if any abnormal behavior is observed, in which case the system will cease taking any requests. Furthermore, automation can be used to automate brand management, allowing brand marketers to gain a better understanding of consumer opinion about their brand, which can be done daily and can be used to identify critical issues. An example of this type of automation is Watson Analytics for social media.

Customer Service: Chat bots have become very popular in a short period of time. It all started with Apple's Siri, but now most brands are using them. Chat bots understand the user's input in a contextual way and respond to their queries accordingly. They are used to automate

customer service calls, sales calls, and marketing communications. Chat bots can also create friction during the app download process on popular platforms such as Facebook, messenger, and more. Chat bots make people feel more human and can help to reduce the workload of customer helpdesk staff.

Software Testing & Development: Software testing is a rapidly changing field. With the increasing availability of automation tools, it is highly likely that some of the work will be automated in the near future. Popular testing tools include ReTest, Aplitools, and SauceLabs. These tools allow developers to focus on core testing and not worry about bug fixing in intelligent systems.

Recruiters often find it difficult to sort through the CVs they receive. Automation can help them identify potential candidates and keep track of old data. Many CVs are already uploaded to their database using automated applicant tracking systems.

Reduce costs: Training a person in any routine task can be costly. You may have to manage employee turnover, provide time for experience and skill development, and incur training costs. A machine, on the other hand, only needs to be trained once and can improve over time with no cost.

Improve efficiency: People may be good at their job or they may grow to be better at it over time, but mistakes will still be made. An automation solution is much more reliable and won't make many mistakes. With time, it will also learn from its outputs and its efficiency will increase.

How can AI Help in Improving the Human Condition?

Companies are increasingly turning to Artificial Intelligence (AI) for a variety of purposes, such as marketing, hiring, and more. However, the lack of consumer trust is a major issue that needs to be addressed. If a company is not already using AI, it may not be something that has been considered. As AI continues to become more widespread, companies may be tempted to use it to make decisions for their customers, but this can lead to customers believing that the decisions are made by a human. This is not the most effective policy, as customers will want to be aware of how their data is being used, who is making the decisions, and if any bias is present. Additionally, in the legal field, companies may be required to share the algorithms that have been used to determine recidivism. By taking these steps, companies can help to restore consumer trust.

In 2019, the combination of AI with other technologies such as ERP solutions, analytics and more will be the key to enterprises' success. By leveraging data from multiple sensors, AI can make better data-driven decisions that can lead to higher quality and better performance.

Leadership takes ownership: AI rollout will not be successful if only one team is involved. All segments of the organization need to be involved. But more importantly, tech rollouts, especially those that change the entire dynamic of an enterprise, must be properly led. Leadership should make AI a priority within the enterprise and provide retraining programs for employees to learn the skills they need to run AI programs effectively. Investing in both software and employees will be necessary if the real benefits are to be realized.AI for Decision-Making: As AI begins to make its way through the various business and organizations and we can see significant openness to AI regarding automated decision making. For example- AI can make decisions about making a refund to a customer or accepting an applicant's mortgage application by evaluating all the conditions. So, the load of off employees and the robot instead will take up the task. But of course, it must be made clear to consumers what is the algorithm which the AI is making use of.

AI and automation is here to stay, and if you don't integrate it into your business, you'll sleep through the miracle of digital transformation. If that happens, your business will miss out on the race and die.

4. CONCLUSION

In conclusion, Automation 2.0 has the potential to revolutionize the way we approach automation, enabling us to create more efficient, effective, and autonomous systems that can improve productivity and competitiveness in a wide range of industries. The integration of artificial intelligence with traditional automation technologies has enabled the creation of intelligent automation systems that can learn, adapt, and make decisions autonomously. The benefits of Automation 2.0 are numerous, including improved efficiency, reduced costs, and enhanced customer satisfaction. AI-powered automation systems can also help companies to reduce errors, improve quality, and enhance their competitive advantage. There are also challenges and limitations to consider, including the need for high-quality data, the potential for bias and error, and the need for ongoing training and maintenance. Additionally, the integration of AI with traditional automation technologies requires significant investment in terms of time, money, and resources. Despite these challenges, the potential benefits of Automation 2.0 make it an attractive option for companies looking to improve their automation capabilities. As the technology continues to evolve, we can expect to see even more innovative applications of Automation 2.0 in various industries. In conclusion, Automation 2.0 is a game-changer for the automation industry, offering a new generation of intelligent automation systems that can improve productivity, efficiency, and competitiveness. As the technology continues to evolve, we can expect to see even more innovative applications of Automation 2.0 in various industries.

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