

The Impact of Artificial Intelligence in Automation: Job Displacement

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Abstract

Over the past few years, there has been a lot of discussion and anxiety about how Artificial Intelligence [AI] would affect job displacement. Robotics, automation, and other AI-related technologies have the potential to significantly alter a number of industries as well as the labor market as a whole. While AI has many advantages, such as higher productivity and efficiency, it also has drawbacks, particularly in terms of job displacement. Discussions regarding artificial intelligence's potential effects on the labor market have been generated by the technology's rapid advancement. Concerns about intelligent machines replacing humans as workers grow as AI technology progresses. It has the ability to automate repetitive, routine tasks in a variety of industries, which would eliminate some job jobs. Automation is more likely to occur with tasks that are simply specified, characterized, and carried out algorithmically. As AI systems advance, they will be able to complete jobs that traditionally required human labor more effectively and inexpensively. This holds true for both simpler and more complicated jobs as well as routine and recurring ones. Robots with AI, for instance, can perform complex assembly procedures in manufacturing, which frees up space for human workers. Similar to this, chatbots and virtual assistants can address common questions in customer service, taking the place of call center agents.

The impact of Artificial Intelligence in Automation: Job Displacement

The experience of the manufacturing business, notably in the automotive sector, is one fascinating real-world case study that graphically depicts the impact of AI on job displacement. Over the past two decades, this industry has undergone a significant transformation thanks to the introduction of AI-driven automation and robotics. Human labor has historically been used extensively in the manufacturing of automobiles for jobs like welding, painting, and assembling. However, the production process has undergone a revolution since the introduction of AI-powered robots and automation systems. These

machines can complete jobs more accurately and consistently than people can because they are outfitted with cutting-edge sensors and machine learning algorithms. As a result, robots now carry out a number of mundane and repetitive jobs that were previously handled by human labor. The widespread adoption of artificial intelligence has the potential to boost productivity and create new jobs, but these improvements have a price. Since 2000, 1.7 million manufacturing jobs have been gradually eliminated by automation technologies, and white-collar jobs are now also in risk of being mechanized out of existence (Urwin, 2023). Production lines have undergone a revolution thanks to AI in the car manufacturing industry. Robots now have the precision and efficiency to handle difficult jobs like welding, painting, and assembling with the help of AI algorithms and cutting-edge sensors. The ability of these machines to operate continuously without being worn out has increased production and raised product quality. But frequently, this effectiveness comes at the expense of manual effort. Similar to how AI-driven robots can install parts and components swiftly and with little error during assembly, eliminating the need for human labor.

Henry Fords' Machines

Manufacturing techniques are recognized as being revolutionized by Henry Ford, a pioneer in the automobile sector, particularly through the utilization of assembly lines. Although Ford's inventions predate the current state of artificial intelligence, they nonetheless have some ideas in common with AI-driven automation. The moving assembly line, a ground-breaking invention by Henry Ford, was first used at the Ford Motor Company's Highland Park facility in 1913. Vehicles may move up a conveyor on this assembly line as workers at each station completed specified tasks. The idea dramatically accelerated and improved the production of automobiles; for example, it cut the time it took to construct a Model T from more than 12 hours to roughly 90 minutes. This system was a forerunner of the automation ideas that underlie AI-driven operations, even if it wasn't AI in the modern sense.

This section of the assembly line can now operate 15% faster thanks to technology, which is a huge increase in the automobile industry where tight profit margins rely largely on manufacturing efficiencies.

Lon Van Geloven, production manager at the Livonia factory, says, "I personally think it is going to be something of the future." According to him, Ford intends to investigate whether additional plants can employ the technology. Anywhere a computer can learn by sensing how objects fit together, according to Van Geloven, the technology can be used. He explains,

"There are lots of those uses. (Knight, 2021)

An opportunity: How Ford Changed the World of Automation

Ford's assembly line, which concentrated on routine and standardized operations, might be considered as an early example of automation. To ensure a smooth production process, workers were given specialized, repetitive duties to complete, such as installing particular automotive parts. Although the technology wasn't AI-based, it did incorporate some automation ideas that are the cornerstone of AI-driven processes in contemporary manufacturing. Ford's assembly line model has been elevated in the modern day by AI and robotics. With the help of robotics and advanced AI systems, more difficult tasks may be completed with greater flexibility and adaptability. Compared to Ford's original assembly line, these AI-driven manufacturing procedures can instantly optimize productivity, quality control, and resource allocation. Henry Ford's development of the assembly line showed how an organization, employee, and client profit when technology and people are combined (Pontefract, 2018). The modern manufacturing sector was established by Henry Ford's pioneering use of automation in the early 20th century. His assembly line model, albeit unrelated to modern AI, illustrated the advantages of automating repetitive operations to boost productivity and cut costs—principles that still guide the development and application of AI-driven automation solutions in manufacturing today. Ford's work essentially acts as a

historical precedent for the revolutionary potential of AI in modernizing production lines and manufacturing procedures.

Implications of Automation

Assembly line automation has had both positive and negative effects, including issues of ethics, societal repercussions, and other difficulties. The workforce will be affected by this displacement of human labor, especially low-skilled and blue-collar workers who have historically performed these activities. When manual processes are replaced by automated ones, it may lead to job losses and the requirement for displaced people to pick up new skills in order to compete in the labor market. It's important to remember that AI doesn't just replace employment; it also changes them. New opportunities are created as some roles are replaced.

Positive Implications

Increased productivity and efficiency are two of the main advantages of assembly line automation. Robots and machines are capable of continuous, arduous work, which speeds up production and lowers error rates. Businesses may have cost savings as a result, which may cut costs for customers. Additionally, automation can increase workplace safety by assigning risky and physically demanding activities to machines and lowering the likelihood of worker injuries. This has ethical ramifications because it adheres to the idea of improving workers' wellbeing. Additionally, automation can improve the standard of employment. It frees up human workers to concentrate on more imaginative and sophisticated aspects of their professions by automating repetitive and boring tasks, which could increase job satisfaction.

Negative Implications

Automation of assembly lines has a major detrimental effect on job displacement. There is a risk of unemployment when computers take over tasks that humans once did, as well as a possibility that wages for displaced workers would stagnate or drop. Concerns about

worker livelihoods and social stability are raised by this. It's important to note the social repercussions. Cloud computing, computational systems, networks, and sensors, robotics, material sciences, digital manufacturing, and artificial intelligence are among the enabling technological layers that they often revolve around. At its heart, AI, which builds intelligent systems on top of advancements in fundamental goods or technologies, pervades many other advancements in some way or another (Rege, 2020). If automation results in considerable job losses, communities that strongly rely on companies using assembly lines may endure economic downturns. Because the gains of automation frequently go to company owners and shareholders while the expenses are absorbed by employees, this may add to inequality. Furthermore, it is crucial to use automation ethically. There may be worries about the improper use of technology and the potential for job replacement, employment monitoring, or even spying without proper regard for the welfare of employees. Transparency, just recompense for displaced workers, and ethical data handling in AI-driven automation are only a few ethical issues to take into account.

Challenges

Retraining and upskilling the workforce to accommodate the shifting nature of the labor market is one of the major issues. To learn new skills and move into professions that complement automation, displaced workers require help and training. Businesses and governments both need to invest in this. Managing the social and psychological effects of job loss is another difficulty. When faced with job loss, workers may feel stressed, anxious, or inadequate. To ensure the mental health of people and communities, these emotional difficulties must be addressed. It is crucial to note that there is a complicated web of advantages and disadvantages associated with assembly line automation. It promises improved efficiency, safety, and perhaps even better job quality, but it also brings up moral questions about job loss, economic injustice, and ethical technological use. In order to

maximize the positive social and economic effects of automation while minimizing its drawbacks, these issues and ethical concerns are important and must be addressed.

Addressing the Implications of Automation

A comprehensive strategy is required to mitigate job displacement and encourage ethical AI practices in automation. First and foremost, governments and businesses should focus spending on initiatives for reskilling and upskilling the workforce to provide employees the skills they need for the changing employment market. Second, there should be set and enforced ethical standards for the use of AI, with an emphasis on openness, justice, and non-discrimination in the use of algorithms and data. To establish human-machine partnerships that increase productivity while maintaining job roles, collaborative robotics should be promoted. AI has the potential to replace certain occupations while simultaneously creating new ones. AI engineers, data scientists, ethical experts, and policy analysts are just a few of the trained individuals needed for the creation, implementation, and maintenance of AI systems. AI can also stimulate economic growth by boosting productivity, encouraging innovation, and enabling companies to provide novel services and goods. Employment prospects in linked industries may result from this in turn (Goyer, 2023). Lifelong learning should be encouraged to increase adaptation, and social safety nets should be strengthened to assist displaced workers. At some point, a compromise between the advantages of automation and its social ramifications must be reached, and this calls for cooperation between governments, corporations, and employees.

Conclusion

In conclusion, there are many different aspects and complexities to the impact of artificial intelligence on job displacement. In addition to increasing productivity and opening up new job opportunities, AI also has the potential to replace employees in a variety of sectors and occupations. A proactive strategy is required to solve the issues brought on by

AI-driven job displacement, including reskilling and upskilling initiatives, careful workforce planning, and laws that support inclusivity and income redistribution. To secure a more just and sustainable future of employment, it is essential to balance the advantages and disadvantages of AI in the labor market.

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