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## Consequences of AI in the workforce: How AI is taking our Jobs

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### Abstract

Although artificial intelligence is helping solve many problems in today's world, it is also the reason many people around the world are losing their jobs. AI has the ability to replace or reduce many jobs now and in the future due to the rapidity of its growth. Types of jobs that could be harmed include white collar professions, unlike the blue collar careers that were reduced due to previous technological advancements. The advances in AI have mostly targeted jobs relating to digital art, content creation, and programming, meaning that these careers are most likely to see a reduction due to the growing use of AI. This article aims to review how AI has evolved throughout the years and the consequences it has on the economy as a whole. By taking a look at how AI replaces jobs, we can provide insight on how we can prepare for an increase in the use of AI.

**Keywords:** Artificial Intelligence, Blue-Collar Jobs, White-Collar Jobs, Employment, AI Winter, Educational Reforms, Chatbots, Machine Learning, Natural Language Processing, ChatGPT, Cybersecurity



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## Introduction

With the exponential growth of AI, many issues have come to light, with one of the most significant being its potential impact on the workforce: taking over our jobs. To grasp this issue, we must first know what AI is in itself. AI, also known as artificial intelligence, is the technology that enables computers and machines to simulate human intelligence and problem-solving capabilities. They can perform tasks much quicker and maybe even more effectively than humans. This raises issues about AI replacing human roles at a much lower cost and higher speed. However, we can deal with this issue by using AI to support human progress in areas it cannot fully operate in, focus on jobs that AI can progress, and adapt our education system to align with the modern AI developments. By doing this, we can impede the issue of AI disrupting our economy by replacing jobs.

## History of AI

Alan Turing's "Turing Test" asked whether we can create a computer that simulates humans to the point that a judge cannot tell the difference. The term "artificial intelligence" originated at the 1956 Dartmouth conference and was coined by American professor John McCarthy to describe computers capable of tasks previously done by humans, such as complex reasoning and problem-solving, and thus pass the Turing test (Chris Smith, 2006).

Before advanced chatbots like Chat-GPT, there were primitive AI chatbots that couldn't respond well to prompts. The first AI chatbot, Eliza, a psychotherapist created by computer scientist Joseph Weizenbaum, had very basic responses but still fooled many into believing they were speaking with a real person (Ben Tarnoff, 2023).

A few years after Eliza, AI research paused during the "AI Winter" due to a cut in government investment. The U.S. government had hoped to use AI during the Cold War for tasks like instantaneous language translation, but progress was too slow, and funding was retracted. AI's overhyped abilities were not feasible with the available hardware at that time (Gary Yang, 2006).

After the AI Winter, AI research picked up once again and proved powerful with the invention of DeepBlue, the first chess engine to beat the world champion Garry Kasparov. DeepBlue's victory showcased AI's capabilities, and it renewed interest in AI (Lawrence Aung, 2010).

Computer company IBM created Watson, an AI designed to play Jeopardy, in 2011. Watson played against two of the show's champions and managed to win, showcasing AI's abilities to process language and retrieve relevant information (IBM, 2012).

## Common Use of AI

AI is commonly used in many aspects of everyday life that can easily be overlooked because of its prevalence. This includes programs like search engines, which use AI to quickly find the most relevant information for their users. AI is also used in online shopping and advertising to suggest products and services that users are likely to purchase. AI is also used in language translation



(European Parliament, 2020). An AI company that has risen to prominence in the early 2020s is OpenAI. OpenAI is responsible for many innovations and breakthroughs in AI, including ChatGPT and DALL-E.

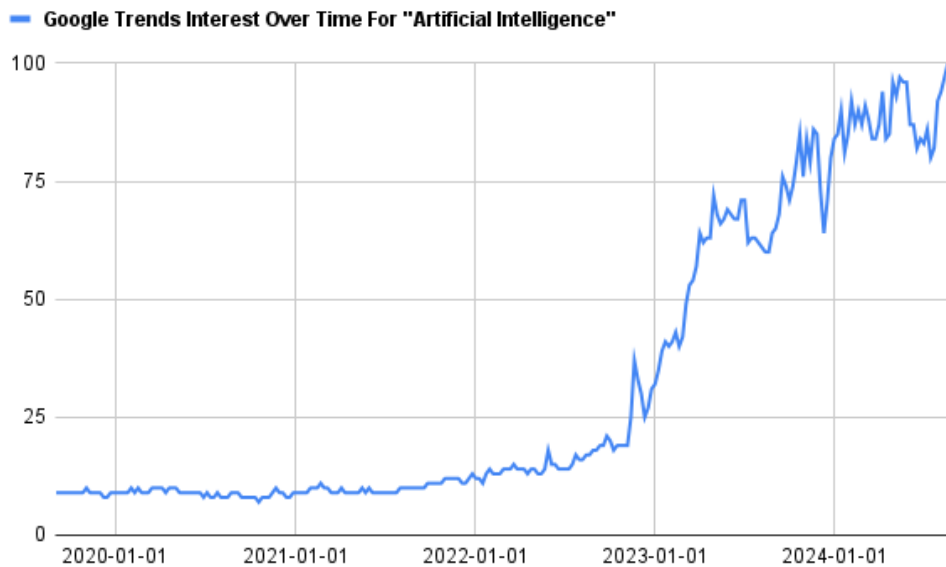


Figure 1. Google trends interest for “Artificial Intelligence” (Google Trends, 2024)

Another use for AI in recent times was the introduction of AI image generators such as DALL-E. These programs can generate entire images with the user's specifications from a prompt. DALL-E was released in 2021 as a text-to-image model but didn't function well. The model then went through further iterations of DALL-E 2 and 3, each better than the last. The latest model, DALL-E 3, can create lifelike images in seconds (OpenAI, 2024).

## The Benefits of AI

AI has revolutionized many aspects of today's modern society and offers many benefits across different sectors, such as healthcare, education, manufacturing, and many more. In all of these sectors, its impact shows many common advantages: it reduces error, handles big data sets, and facilitates automation. These advantages show the transformative potential of AI, as it benefits a wide array of diverse applications.

## Reducing Error

One of the advantages of AI that is seen across all sectors is AI's ability to reduce errors that are usually prone to human mistakes. Modern AI systems, which are powered by complex algorithms and advanced machine learning techniques, achieve better accuracy in automating



data processing tasks. For example, intelligent automation platforms handle tasks with precision, ensuring that errors are virtually eliminated unless the input data is corrupted (Hester, 2022).

In the healthcare sector, an example of AI reducing error would be with diagnosis. In a study by Bhattad and Jain, it concludes that in *Artificial Intelligence in Modern Medicine - the Evolving Necessity of the Present and Role in Transforming the Future of Medical Care*, “Digital twins [a type of ML] can mirror real and may lead to early diagnosis.” Digital Twins is a developing ML that has the potential to predict procedural outcomes, give early diagnosis, and provide individualized treatment plans. Another sector where AI reduces error is in the finance sector. JPMorgan Chase has integrated AI to improve their fraud detection defenses. They use machine learning models for payment validation screening as well as learning language models (LLM) to help reduce fraud rates and false positives (Swezey, 2023). AI allows for real-time monitoring of transactions, which can also detect anomalies that can show potential fraud more accurately and efficiently than traditional systems. With the use of AI in fraud detection, false positives have been reduced by 60% (PYMNTS, 2020).

Although AI helps reduce human errors, there are still many tasks where humans may be more reliable. A great number of these tasks where humans may be better are ones that require empathy. AI can simulate empathy to a degree, but it still falls short when replicating true human emotions. AI systems such as Siri and Alexa can be programmed to show empathy with predefined responses. However, these responses are limited by the data that it has been trained on. AI struggles to deeply understand human emotions, giving predefined empathetic responses rather than genuinely feeling emotions like humans do. As a result, AI can provide basic emotional responses, but it cannot fully replace human empathy, especially in sectors like healthcare, where emotional understanding is critical for patient care (Fleischman, 2024). Overall, by using AI, industries are able to enhance the quality and reliability of their outcomes, resulting in better overall performance across applications.

### **Handling of Large Data Sets**

In the age of big data, the ability to process and analyze vast amounts of information is critical. Traditional methods for data analysis require manual data entry, spreadsheet management, and statistical tools, which can be time consuming and also be prone to human error. On the other hand, AI is able to process larger amounts of data in a significantly shorter amount of time (Rahmani et al. 2020). AI systems excel at processing large amounts of data efficiently and accurately.

For example, in healthcare, AI can rapidly analyze data sets, which allows more precise decision-making. A study published in the *Journal of Big Data* highlights AI's ability to manage large data sets effectively, leading to improved outcomes in various applications (Dash et al. 2019). Similarly, a McKinsey report discusses how generative AI can handle some of healthcare's biggest challenges by efficiently handling and analyzing large amounts of data sets (Bhasker et al. 2023). The ability to process large data sets accurately and efficiently is one of the key advantages of AI, enabling industries to use data-driven insights for better outcomes.



AI's ability to handle large data sets has also led to more informed decision making. By analyzing large amounts of data quickly and accurately, AI systems can find patterns and trends that might be missed through traditional methods, increasing informed decision making. In healthcare, for example, AI can identify early signs of disease, predict patient outcomes, and personalize treatment plans, improving patient care. Overall, AI's capacity to process and analyze big data not only enhances efficiency but also drives innovation and better decision-making, making it an invaluable tool across industries.

### **Automation**

Automation is another significant benefit of AI, allowing industries to smoothen operations and reduce manual interaction. AI-powered automation can perform repetitive tasks with high precision and accuracy, which minimizes human error and increases productivity. For example, in manufacturing, AI-driven robots can assemble products with greater speed and accuracy than human workers, which reduces production costs and increases output. In the healthcare sector, AI is automating tasks like patient scheduling, billing, and claims processing. This not only reduces the workload on healthcare professionals but also improves the accuracy and speed of these processes. A McKinsey report shows the impact of AI in health insurance, where self-learning software is used for smart claims management, significantly reducing processing time and errors (Hehner et al. 2017).

AI in automation has also proven valuable in logistics and supply chain management. Autonomous vehicles and drones are being used for the delivery of goods, helping reduce human involvement as well as improving delivery efficiency. For example companies like Amazon have implemented autonomous delivery drones to facilitate quicker and more reliable deliveries (Jaclyn 2023). Amazon has also used AI to help optimize transportation routes for deliveries. AI can help predict the fastest route, while also taking into account obstacles such as weather or for something more unexpected like getting a flat tire (Amazon, 2024).

### **The Effect of AI on Employment**

AI is revolutionizing industries worldwide, significantly changing employment landscapes. The impacts of AI on the job market have effects, influencing job reduction, job creation, and maintaining some professions that require human capabilities. Understanding these effects is crucial for many as we prepare for a future increasingly shaped by AI.

#### **What Jobs will Decrease**

AI is increasingly automating jobs that involve repetitive and predictable tasks, threatening roles in sectors like manufacturing, customer service, and data processing. In manufacturing, AI-powered robots and assembly lines have transformed production processes. Machines can work continuously without burnout, while also assembling products with high precision and speed, significantly reducing the need for human labor. It is reported that up to 800 million workers worldwide could be replaced by automated systems by 2030 (Adio-Adepoju, 2024). This highlights that factory jobs are among the most vulnerable to AI-driven automation. For



example, automotive companies have started using robotic arms for car assembly, which perform tasks more efficiently than humans (Wermelinger, 2024).

AI's impact also extends to administrative and clerical jobs, where automation software performs functions such as scheduling, data entry, and even HR operations. Robotic process automation (RPA) has become a popular tool for businesses to streamline tasks, reducing reliance on human workers. Using RPA has decreased the need for labor-intensive jobs by 80%, resulting in fewer job opportunities in data processing and administrative support (Strategic Market Research, 2023). In the customer service industry, chatbots powered by natural language processing (NLP) are increasingly managing customer inquiries, handling everything from booking appointments to processing complaints. For instance, companies like Amazon and Google have implemented AI-powered chat services that allow for immediate, efficient communication without human intervention, reducing the need for call center employees.

Transportation is another sector facing major disruption. Autonomous vehicles, including self-driving cars and delivery drones, are being developed by tech giants such as Tesla and Google. Once fully implemented, these technologies could eliminate millions of driving jobs, including those of taxi drivers, truck drivers, and delivery personnel. It is estimated that in the next five years, 25% of jobs in the Supply Chain and transportation industry will decrease (Chang, 2024). Though widespread adoption of autonomous vehicles is still in development stages, companies are steadily investing in AI to streamline logistics and distribution. As AI technologies advance, industries reliant on manual and routine labor will continue to experience job losses, requiring workers to reskill for new opportunities.

### **What Jobs Will Increase**

While AI threatens certain jobs, it is also a catalyst for job creation, particularly in fields that require advanced technical skills, creative problem-solving, and human oversight. The tech industry, for example, has seen an explosion in demand for AI machine learning engineers, data scientists, and AI specialists. AI related roles are among the fastest-growing, with AI specialist positions increasing by 74% in the past 4 years. These jobs are essential for developing and maintaining AI systems, ensuring algorithms perform correctly. The job market for cybersecurity is also growing as organizations require stronger security measures to protect against cyber attacks. As AI technology evolves, so does the need for professionals who can design and manage AI environments.

Healthcare is also another sector experiencing growth due to AI innovations. Medical roles such as AI technicians, data analysts, and bioinformatics specialists are becoming crucial as AI assists in diagnostics and personalized medicine. AI can help detect diseases earlier by analyzing medical images with greater accuracy than humans. However, this does not diminish the importance of human doctors and nurses. Instead, it strengthens the ability to provide effective treatment. A report by Shefali V Bhagat and Deepika Kanyal projects that AI will create roles focusing on AI-human collaboration, where medical professionals use AI tools to improve patient outcomes. An aging global population ensures a continued demand for healthcare





workers, specifically in areas like elderly care and rehabilitation, which require a human touch that AI cannot replicate.

The green energy sector is also expanding due to AI's ability to optimize energy use and manage smart grids. Engineers and environmental scientists are in high demand as countries look to meet climate goals. A study by Son et al. highlights job growth in sustainable urban planning, where AI helps design eco-friendly infrastructure and improve city living. AI ethics and compliance specialists are also emerging as corporations navigate the moralities of using AI. These roles involve ensuring that AI systems are transparent, unbiased, and aligned with ethical standards, creating new lanes for employment. As society embraces AI, jobs centered on human-AI collaboration and ethical management will become increasingly important.

### **What Jobs Will Stay the Same**

Despite AI's growing capabilities, certain jobs are likely to remain unaffected due to the necessity of human creativity, emotional intelligence, and complex judgment. Healthcare roles like surgeons, therapists, and emergency room doctors require quick, intuitive decision-making and compassionate care that AI cannot replicate. Although AI can assist with medical diagnostics and procedural planning, it cannot replace the human skills needed for complex surgeries or mental health treatment. AI will serve as a supportive tool in healthcare, enhancing professionals' efficiency but not replacing them (Hazarika, 2020). Jobs involving patient interaction and critical thinking will remain a cornerstone of healthcare delivery.

Professions in law, such as judges, litigators, and mediators, are similarly insulated from AI disruption. The practice of law involves interpreting statutes, advocating for clients, and understanding human motivations, all of which are beyond AI's current capabilities. AI can streamline administrative tasks in law firms, like document review and case research, but it cannot argue cases in court or make ethical judgments. According to the Harvard Business Review, AI lacks the capacity for moral reasoning, making it unsuitable for professions where ethical decision-making is crucial.

Creative industries such as art, music, writing, and design, also maintain a level of security from AI automation. While AI-generated art and music are becoming more sophisticated, they cannot replicate the originality and cultural relevance of human creators. Roles in education and social services, such as teachers, counselors, and social workers, are similarly resilient. These jobs require deep emotional intelligence, empathy, and the ability to build trust with students or clients. It is predicted that AI will complement teachers by automating administrative tasks but will never replace the nurturing and mentorship that define human educators (Elliot, 2024). Social workers, who deal with complex personal issues, also remain essential in providing emotional support and community outreach.

Jobs that require human creativity, ethical discernment, or emotional engagement will continue to be essential, even as AI reshapes the broader employment landscape. While AI can support and enhance these roles, the intrinsic human qualities they require are irreplaceable.

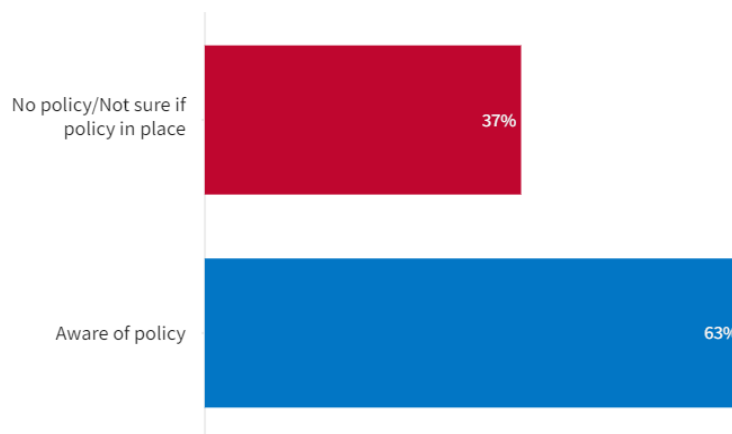


## How to Prepare for Increase AI Use

One way we can develop solutions to the increased use of AI for automating jobs is by looking at the types of jobs that are affected by AI. Jobs can generally be categorized into blue-collar and white-collar jobs. Blue-collar jobs are jobs that require manual labor whereas white-collar jobs are jobs that are confined within a managerial or administrative position. With the growth of AI, both of these job archetypes are evolving to utilize AI along with themselves. However, blue-collar jobs have already adapted from technology most notably from the industrial revolution. Factory workers were faced with automated machinery which made it hard to compete against. This resulted in the loss of many jobs due to the inability to keep up with the growing technology (James E. Bessen, 2019). With the expansion of AI, white-collar jobs have come across the same issue but against AI which, like during the growing days of automated machinery, will not only force people to adapt, but possibly replace the jobs (John Chelliah, 2017).

Another way we can prepare for the growing cause of AI is by making educational reforms that do not dismiss AI. Rather, we should include it in the curriculum so students can easily adapt and use it in school to prepare for the real world where they may end up using it for their future jobs. Currently, teachers are distrustful of students using AI because it makes their work seem disingenuous. However, this will of course contain heavy restrictions in order to contain the integrity of a classroom but its end solution will allow students of the future to use AI to the fullest extent (Wayne Holmes et al., 2021).

**Teacher Awareness of School Policies on Generative AI**



SOURCE: Source: Center for Democracy & Technology, June-Aug. 2023 survey of 1,005 middle and high school teachers

A Flourish chart

Figure 2. Bar graph comparison of teacher awareness of school policies on generative AI





## Adapting to the Use of AI

Although it's apparent that we must adapt to AI, how can we do this? First of all, a workforce collaborating with AI is known as an "augmented workforce", it is essentially humans and AI working together to enhance productivity and lower the workload for many jobs while reducing human error. For example, repetitive and data-intensive tasks are receptive to human blunders and can take an extensive amount of time. When AI handles these kinds of issues, it gives the worker more time to work on problems that AI cannot deal with, such as those requiring human interaction (Ajay Agrawal et al., 2018).

To adapt to AI, we need to understand the work it can do. As we have seen, AI is able to deal with repetitive and time-consuming work along with using data to make various assumptions. Different job sectors can use AI to benefit them in their own way. This can include—but is not limited to—AI diagnosing patients in the medical industry using past patients as data, AI executing stock trades at the best time based on data in the finance industry, AI determining the most efficient way of getting somewhere in the transportation industry, and many more. These examples interpret that AI works especially well with data and can make assumptions based on these details. It's essential that we be able to use AI to its highest capabilities so we can get the most out of it.

## Conclusion

To conclude, AI is able to do much of the work a human can due to its ability to do work at a quick and efficient rate which can result in it taking our jobs. However, rather than having AI completely take over our jobs, we can use it to make us do more work much faster. With this, we can stop AI from taking our jobs and prevent it from tanking our economy.

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