

The Impact of Artificial Intelligence Technology Applications on the Employment Structure of the Labor Force

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Abstract. Advancements in artificial intelligence (AI) have occurred alongside digitization, big data, and computing power and have significantly impacted how the global labor market works. This paper examines the effects of AI applications on the labor market and the structure of the workforce. The main method of research is literature review; academic articles on the implementation of AI and its effects on the workforce are reviewed and analyzed to understand skill-biased and task-biased technological changes along with displacement, reinforcement, and productivity effects of AI. This paper finds that AI contributes to increasing the demand for highly skilled workers who would be able to complement intelligent systems while reducing the demand for simple professions and jobs that can be automated. However, the overall impact on employment is weak so far due to the offset of job losses resulting from automation by the emergence of new job positions at more productive companies using AI.

Keywords: Artificial Intelligence, Employment, Labor Market, Workforce

1. Introduction

Artificial Intelligence (AI) can be defined as a system that performs a set of tasks with the aid of human perception, reasoning, learning and decision-making, and mainly using large language models and machine learning techniques. With the rapid progress in AI technologies, derivative issues, such as job loss and labor market disruption, are becoming increasingly evident, but current research does not provide any consistent conclusions [1, 2]. The majority of research focuses on the impact of technology on jobs that are routine operations. In reality, AI systems more frequently perform cognitive operations, thus changing common ideas of the job market situation [3]. This paper is aimed at analysing the influence of AI on the landscape of the workforce in terms of skills and professions in use. This study focuses on the influence of AI on labour demand, innovations introduced to the job market, and labour supply distribution among various skills. The research method used is a systematic literature review of academic articles that studied the impact of AI up to 2026. The findings of this study will be useful to society as they will help to understand how to manage AI so that it does not negatively affect human lives. Since AI is rapidly advancing, many human workers feel that they will be replaced by AI, so they may hesitate to adopt AI. This study seeks to provide valuable insights related to AI's impact. Companies and organizations can benefit from using those insights to improve their AI initiatives. Future researchers can also utilize the

findings of this study to further their studies on AI's impact on jobs; they may focus on specific jobs and sectors, which will provide more credible results.

2. Development of artificial intelligence technology

2.1. Rise of AI technology

AI has rapidly advanced as a result of computing development, the emergence of large datasets, and breakthroughs in computer training [3]. Early research on AI started in the 1950s, but progress accelerated in the 2010s due to cloud computing, big data, and neural networks that made practical applications in speech, vision, and natural language possible [2-4]. This means that AI is not a new technology; it has been in development for a very long time. It was not the center of focus in the past, but in the 2020s, AI became the buzzword because companies started promoting it aggressively. The general public was introduced to AI, and they were made to believe that AI is the future. People started thinking that if they do not use AI, they will be left behind and cannot keep up with the world [5], so they emphasized AI. Companies started using AI in their operations. As of 2026, AI is widely utilized in various sectors. Most people are using AI; it is accessible to anyone with an internet connection.

2.2. Applications of AI technology

AI has been introduced in a variety of areas, including healthcare in the process of diagnostics and drug discovery, finance for credit score evaluation and fraud detection, manufacturing in relation to predictive maintenance and robotics, and professional services industries like legal research and content generation [4, 5]. However, the most notable influence of AI is observed in areas where a lot of data processing is performed, such as business analytics, software engineering, and customer services; in these areas, AI can be used for improving or automating intellectual services [5]. There are already developments in the field of creative industries, education, and state and public administration, which shows that the impact of AI will be observed in almost all sectors in the near future. Using AI to automate routine tasks is profitable for companies because they do not need to hire human workers to do tasks that do not require much thinking [6, 7]. However, current trends show that AI application has significantly increased in creative fields, such as digital art, writing, film-making, and music composition; many have called for an AI ban in creative fields because they argue that creativity is a human asset and needs to be protected from AI manipulation.

In this study, the focus is on understanding the impact of AI on employment and labor force. AI technology penetrates almost all sectors, so understanding AI is critical not just for companies and organizations but also for society. This study provides findings that can raise awareness in society about the impact of AI on the workforce; it can help to fix misunderstandings and promote the truth about AI in society. People need to know that AI is not always bad. Companies can use this study for guidance to develop plans for AI implementation, while future researchers can further their research by using source materials from this study.

3. Impact of artificial intelligence technology on labor force

3.1. Changing structure of labor force due to AI technology

The labour market is undergoing a major transformation as a result of AI as it pushes workers toward jobs requiring specialized skills while at the same time decreasing the need for various

routine and mid-level-skilled tasks. Research shows that the use of AI leads to more employment opportunities for those working in highly skilled professions, including those who function in areas with high exposure to AI [5-8]. At the same time, occupations performing routine tasks are losing their share of job positions [9]. Employees are being told that they need to learn how to work with AI; they are supposed to use AI to make their work easier. This means that those who cannot learn AI may be left behind. Most companies want to reduce spending and increase profits, and they will not hesitate to fire employees if they can get AI to do the same work [10]. Over the years, many prominent companies, including Google, Amazon, Microsoft, and Apple, have laid off a large number of employees, and these companies are now actively promoting AI applications. They want to make more money by spending less on workers.

This finding is significant because it predicts the future of the labor force. While highly skilled people will find more jobs as AI applications increase, those with mid-level skills will likely lose their jobs [8]. It is unfortunate, but it is the norm; as technology advances, new jobs are created, and old jobs are replaced. It has happened before, and it will continue to happen in the future. The only thing that people can do is to adapt. These findings suggest that workers need to focus on high-level skills like creativity, critical thinking, and emotional intelligence if they do not want to be replaced by AI. This will significantly impact society as well as companies and organizations. Companies can use these findings to modify their hiring strategies; they may not need to hire human workers for routine tasks as AI can do such tasks [11], but they do need to look for people with high-level skills. Highly skilled workers will use AI to improve the quality of their work, which will increase productivity.

3.2. Factors driving the change in labor force

The important factors include the substitution of human functions by AI, the reduction of expenses and growth of production by AI, and the appearance of new work assignments and positions in connection with AI [2-4]. Routine tasks, such as data entry, transcription, scheduling, and bookkeeping, are being replaced by AI. Many companies no longer hire human workers for these jobs. AI makes it possible for companies to save money because they may not need to hire human workers for some positions [10, 11]. As AI is being integrated into business operations, new positions emerge [12], such as AI engineer and AI analyst, and these jobs can be done by workers who know how to use AI. At the firm level, the decisions on AI involvement, the investments in reskilling, and the redesigning of tasks determine the fate of workers, whether they will remain unemployed or will get new employment opportunities [13]. Besides, uneven AI application across sectors and geographical regions contributes to the differences in labor market outcome in favor of businesses and regions with higher digital readiness [6]. Therefore, companies are looking for human workers who can work with AI.

3.3. Consequences of the change

Changes in the work force can lead to occupational polarization; there may be an increase in employment at the high and low ends of the skill spectrum while jobs requiring middle level skills can witness a decrease [8]. Low-skill jobs like manual labor will be done by human workers unless humanoid robots become widely accessible. Those with mid-level skills will likely struggle as their jobs can be automated. Workers will be motivated to foster high-level skills. However, research indicates that instead of automating hundreds of jobs, AI technology would rather change the types of tasks performed within individual occupations [3]. This means that the way people work will

change; AI will not just automate routine tasks but also create new tasks. However, this might lead to a situation where productivity and pay will most likely increase, while increasing inequality if labor force programs are not able to keep pace with those changes [1-3]. This will impact workers who cannot keep up with AI; they will be laid off if they cannot quickly adapt to AI. The point is that human workers with mid-level skills will have to choose between adapting to AI or losing their jobs if companies and organizations continue to integrate AI into their operations. AI technology is still developing, so current trends may change in the future, so it is important to be flexible when it comes to AI [14]. Companies need to understand that what they know about AI may change in the future, so they need to stay updated.

3.4. Evaluation of the change

These changes in employment and labor force due to AI have their advantages and disadvantages. In terms of advantages, AI can increase productivity, provide new kinds of high-skilled jobs, and improve working conditions through automation of routine and boring tasks [2]. AI can help human workers do their work faster; it can be used as an assistant to do various tasks, so human workers can focus on increasing the quality of work instead of worrying about minor tasks [13]. New jobs that require high-level skills will emerge due to AI; those who know how to use AI may gain a competitive advantage and achieve greater success in comparison to those who do not know how to use AI [8, 9]. Routine tasks can be boring and do not require high-level skills, so they can be automated. This can improve working conditions as workers will shift their attention to quality. There are also disadvantages; it will lead to job loss for workers who mostly engage in routine tasks, increase the skill gap as workers will need to learn how to use AI, and create wage inequality if valuable skills are not widely distributed [4-7]. Human workers who only know how to do routine tasks will likely be laid off because companies do not want to pay more money to human workers when they can get AI to do the same work at a very low price [9]. Being able to use AI may be a lifeline for many workers, but those with better skills may achieve greater success and get better compensation. Overall, these changes are good for companies but not for all human workers. It is evident that human workers will lose their jobs, and skills will be the deciding factor. This means those who cannot improve their skills due to issues like limited education, economic condition, learning disabilities, or environment will be negatively impacted.

This finding is significant because it presents a dilemma; AI will indeed lead to job loss but not for everyone, and those who will be mostly impacted are working-class people because they may not have high-level skills. Workers who are able to learn AI applications may be able to protect their jobs, and this will create inequality in the workplace [15]. It suggests that skills will be used to categorize people in the workplace. Equality exists in present society, and it may get worse for workers because of AI. High skills will be rewarded whereas mid-level skills will be ignored. Companies can use this finding to come up with better employee management strategies.

4. Conclusion

The paper analyzes how AI technology is affecting the labor market, emphasizing the skill composition, occupational shifts, and mechanisms behind the process. The findings show that AI changes the employment situation by creating demand for high-skilled workers but at the same time decreasing demand for mid-level-skilled job positions and jobs that require routine skills. Nevertheless, net employment still remains relatively modest since productivity and new tasks undermine the negative impact of job loss in many sectors of the economy. Still, it will negatively

impact human workers who may not be able to keep up with AI. The limitations of the present study include reliance mainly on academic articles, which could mean that long-term effects of generative AI application are not considered completely, and the informal economy and developing countries are given little attention. Also, AI is rapidly developing and causing changes in different sectors, which means that future trends may be different from current trends. This means that the findings of this study should not be treated as solid evidence; they should be considered a source that documents how AI has changed the world. The goal of this study is to show the changes in the labor force caused by AI. Therefore, future studies need to assess the long-term effects of AI on wages inequality and examine how the AI strategies implemented at different firms influence the labour situation and assess the effectiveness of reskilling and social protection measures. Future researchers can use these findings to further their studies.

References

- [1] Babashahi, L., Barbosa, C. E., Lima, Y., Lyra, A., Salazar, H., Argolo, M., de Almeida, M. A., & Souza, J. M. D. (2024). AI in the workplace: A systematic review of skill transformation in the industry. *Administrative Sciences*, 14(6), 1-28. <https://doi.org/10.3390/admsci14060127>
- [2] Bayar, C., Panugaling, J., Lotf, A., & Arslan, E. (2025). Consequences of AI in the workforce: How AI is taking our jobs. *London Journal of Social Sciences*, (9), 47-58. <https://doi.org/10.31039/ljss.2025.9.322>
- [3] Chiekezie, N. R., Obiki-Osafiele, A. N., & Agu, E. E. (2024). Preparing the workforce for AI technologies through training and professional development for future readiness. *World Journal of Engineering and Technology Research*, 3(1), 001-018. <https://doi.org/10.53346/wjetr.2024.3.1.0050>
- [4] Doubkova, M., & Magdin, M. (2026). The impact of AI on the labour market. *Management & Marketing*, 21(2), 1-21. <https://doi.org/10.1007/s44491-026-00003-y>
- [5] Evans, A. J. (2025). Methodological implications of using machine learning to estimate the impact of AI on the workforce. *Technological Forecasting and Social Change*, 218, 1-15. <https://doi.org/10.1016/j.techfore.2025.124197>
- [6] Farrow, E. (2022). Determining the human to AI workforce ratio—exploring future organisational scenarios and the implications for anticipatory workforce planning. *Technology in Society*, 68, 1-12. <https://doi.org/10.1016/j.techsoc.2022.101879>
- [7] George, A. S. (2024). Workforce impacts by 2030: Job losses and opportunities in an era of automation and AI. *Partners Universal International Research Journal*, 3(4), 41-47. <https://doi.org/10.5281/zenodo.14677191>
- [8] Goel, A., Dede, C., Garn, M., & Ou, C. (2024). AI-ALOE: AI for reskilling, upskilling, and workforce development. *AI Magazine*, 45(1), 77-82. <https://doi.org/10.1002/aaai.12157>
- [9] Lama, G., & Lastovska, A. (2025). Exploring public sector workforce attitudes toward AI competence and its impact on AI competence self-assessment. *Social Sciences & Humanities Open*, 12, 1-10. <https://doi.org/10.1016/j.ssaho.2025.101809>
- [10] Liu, J. (2024). The impact of the development of artificial intelligence on unemployment rates. *Advances in Economics, Management and Political Sciences*, 121(1), 154-163. <https://doi.org/10.54254/2754-1169%2F121%2F20242410>
- [11] Madanchian, M. (2025). Frameworks for AI integration in HR and workforce adaptation. *Procedia Computer Science*, 258, 916-924. <https://doi.org/10.1016/j.procs.2025.04.330>
- [12] Olludotun, B., Kayode, O., & Tunde, S. (2023). Understanding the impact of artificial intelligence on workforce structures and social organizations. *Journal Social Humanity Perspective*, 1(2), 47-58. <https://doi.org/10.71435/621421%20>
- [13] Tasheva, Z., & Karpovich, V. (2024). Supercharge human potential through AI to increase productivity in the workforce in the companies. *American Journal of Applied Science and Technology*, 4(2), 24-29. <https://doi.org/10.37547/ajast/Volume04Issue02-05>
- [14] Watts, S., & Munir, T. (2026). Bridging the gap: Exploring innovation enablers, challenges and AI adoption for enhanced workforce productivity. *International Journal of Productivity and Performance Management*, 75(3), 1030-1046. <https://doi.org/10.1108/IJPPM-01-2025-0001>
- [15] Xavier, D. F., Korunka, C., & Reiter-Palmon, R. (2025). AI integration and workforce development: Exploring job autonomy and creative self-efficacy in a global context. *PLoS One*, 20(6), 1-17.

<https://doi.org/10.1371/journal.pone.0319556>