



The Impact of Artificial Intelligence on the Job Market

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Abstract. With the rapid development of AI technology, its widespread application in various industries has had a profound impact on employment structure, job demand, and labor force skills. Research shows that AI activates potentially relevant industries through its penetration, collaboration, substitution and creativity, and its impact on employment is all-encompassing and multifaceted, which may not only replace employment in traditional industries, but also promote employment in new fields^[1]. This paper explores the multifaceted impact of Artificial Intelligence (AI) on the job market by analyzing the dual impact of AI technology on the job market, exploring its positive role in improving productivity, promoting career transformation and creating new occupations, and also revealing the disappearance of jobs, occupational substitutions, and unemployment that it may lead to. It concludes with strategies for governments, businesses and educational institutions to cope with the impact of AI. In the future, AI technology will continue to profoundly change the structure and trends of the job market, requiring collaboration among multiple parties to make full use of the potential of AI technology to promote the sustainable development of the labor market and build a more inclusive and fair society.

Keywords: artificial intelligence, job market, dual impact, strategic response

1 Preface

1.1 Background of the study

Artificial Intelligence (AI) is a computer technology that simulates human intelligence and has made remarkable progress in recent years. In the medical field, AI's intelligent diagnostic system can assist doctors in diagnosing diseases, improving diagnostic accuracy and efficiency; in the manufacturing field, AI-driven automated production lines have dramatically increased production efficiency and reduced labor costs.

The rapid development of AI technology is not only driving industrial upgrading, but also profoundly changing the global economy and social structure. According to a report by the McKinsey Global Institute, AI could contribute \$13 trillion to global economic growth by 2030 and significantly change the labour market landscape^[2]. However, the widespread use of AI has also triggered a wide-ranging discussion about the job market. On the one hand, AI technologies have contributed to economic

growth and social progress by increasing productivity; on the other hand, they have replaced some traditional jobs. This phenomenon of “creative destruction” confronts the job market with unprecedented challenges.

1.2 Purpose of the study

The purpose of this paper is to delve into the dual impact of AI on the job market, including occupational substitution, the emergence of emerging occupations, and changes in labor skill needs. The establishment of this research purpose is based on the current reality that the job market needs to face great changes in the context of the rapid development and wide application of AI technology. The uniqueness of AI technology is that it can replace not only manual labor, but also some mental labor, which makes its impact on the employment market more complex and far-reaching. Therefore, exploring the impact of AI on the job market not only helps to understand the current economic and social changes, but also provides an important reference for the future transformation of the labor market.

1.3 Significance of the study

Studying the impact of artificial intelligence on the employment market not only helps to understand the future development trend of the labor market, but also provides policymakers, enterprises and individuals with coping strategies, which is of great practical significance.

For policymakers, understanding the impact of AI technology on the employment market can help formulate more scientific and reasonable employment policies. For enterprises, studying the impact of AI technology on the employment market helps to adjust human resource strategies. For individuals, studying the impact of AI technology on the employment market helps to plan career development paths to adapt to new employment market demands. By deeply exploring the dual impact of AI technology on the employment market, we can jointly meet the employment challenges in the AI era.

2 Literature Review

2.1 Current status of AI technology development

In recent years, Artificial Intelligence (AI) has been growing rapidly as a cutting-edge technology field that integrates multiple disciplines.

Machine learning is one of the key technologies of Artificial Intelligence (AI), which utilizes algorithms to enable computers to acquire knowledge from data and make predictions or decisions. Deep learning is able to handle more complex tasks by building multi-layer neural network models, and in the field of image recognition, deep learning has surpassed the human level, greatly advancing areas such as autonomous driving technology and medical image analysis.

Natural language processing technology enables computers to understand and generate human language. In recent years, models based on the Transformer architecture have achieved remarkable results in tasks such as text generation, machine translation and sentiment analysis. For example, generative AI models such as ChatGPT have been widely used in areas such as education, customer service and content creation.

Artificial intelligence technology has achieved wide application in various fields such as healthcare, finance, manufacturing, education and transportation. In the medical field, AI-assisted diagnostic systems can help doctors quickly identify diseases and improve the accuracy and efficiency of diagnosis; in the financial field, AI algorithms can be used for risk assessment, investment decisions, and customer service; and in the manufacturing industry, AI-driven automated production lines have greatly improved production efficiency and reduced labor costs.

Although AI technology has made great progress, its development still faces many challenges. The training of AI models relies on massive amounts of data and powerful computing resources, while data privacy and ethical issues are becoming increasingly prominent.

2.2 Current situation on the job market

As an important part of the economic system, the structure and trends of the job market are influenced by multiple factors, including technological progress, economic globalisation and demographic change. In recent years, with the rapid development of AI technology, the job market is undergoing profound changes.

According to the International Labour Organization (ILO), the global job market is showing the following trend: the demand for high-skill jobs is increasing, while the demand for low-skill jobs is gradually decreasing. Frey and Osborne's research states that AI technology could replace 47% of U.S. jobs ^[3]. Bessen, on the other hand, believes that the application of AI technology will create more high-skill jobs and drive the transformation of the labour market.

The impact of AI technology varies significantly across industries. The widespread adoption of automation technology has reduced the need for production line workers, but increased the demand for highly skilled engineers and technicians. In areas such as customer service, retail and logistics, AI technology has replaced some low-skilled positions while spawning new occupations such as data analysts and AI system maintainers. In the financial industry, the use of AI algorithms in risk assessment and investment decision-making has reduced the need for traditional financial analysts, but increased the demand for data scientists and AI specialists. However, the skill requirements of many traditional jobs do not match the needs of the AI era, leading to structural unemployment. The difficulty of transitioning low-skilled labour to higher-skilled jobs and the insufficient supply of high-skilled labour are particularly acute in developing countries.

2.3 Research on the impact of AI on the job market

In recent years, China's artificial intelligence industry has developed strongly. According to statistics, the market scale of China's AI industry reached RMB 18.7 billion in 2021, with a compound annual growth rate of 58.1% from 2017 to 2021, and the market scale of China's AI market reached RMB 304.3 billion in 2023 ^[4]. This fast-growing trend signals that AI will continue to play an important role in the future.

Some researchers believe that although AI technology may replace some jobs, it also creates more new jobs, so the positive impact dominates; others believe that the productivity enhancement of AI technology may lead to a reduction in employment demand and bring negative impacts ^[5]. Some scholars have argued that the application of AI technologies has exacerbated the skills mismatch problem. Since AI technologies usually require high levels of skills and innovation, and the existing workforce may not be able to fully meet these requirements, a large amount of skills training and re-education is needed. It has also been argued that the skills mismatch problem is not entirely caused by AI technologies, but is related to the overall education system and socio-economic structure. The impact of AI technology on the job market is complex and far-reaching. We need to study in depth the specific impact of AI on the job market and formulate effective coping strategies.

3 The Positive Impact of Artificial Intelligence on the Job Market

The rapid development of artificial intelligence (AI) technology has not only driven scientific and technological progress, but also had a profound impact on the job market. Although AI technology poses a threat of substitution for some traditional jobs, its positive role in improving productivity, facilitating career transformation and creating new careers should not be overlooked.

3.1 AI's potential to increase production efficiency and economic growth

Artificial intelligence technology can automate a large number of repetitive tasks, reduce human error, and improve work accuracy and efficiency. For example, in the manufacturing sector, AI-powered robots can work around the clock to perform tasks such as assembly, testing, and packaging, reducing labor costs. According to a report by the McKinsey Global Institute, AI technology is expected to increase global labor productivity by more than 1.2 percent by 2030. AI technology can quickly process and analyze massive amounts of data to provide accurate decision support for businesses. For example, in the financial industry, AI algorithms can analyze market data in real time to reduce risks. According to a study by PricewaterhouseCoopers, AI technology will contribute \$15.7 trillion to global GDP by 2030.

3.2 AI technologies for career transition and skills enhancement

The application of AI technology has caused some traditional jobs to disappear, but it has also provided opportunities for workers to transition to higher-skilled positions. For example, production line workers in the manufacturing industry can transform into industrial robotics technicians by learning robot maintenance and programming skills. As the demand for high-skill jobs continues to grow, workers need to improve their abilities through learning and training to adapt to the new employment situation. The rapid development of artificial intelligence has made lifelong learning an inevitable trend, and workers need to continuously update their knowledge and skills to cope with changes in the job market.

3.3 Emerging careers are born, AI creates new jobs

The widespread use of AI technology has given rise to many support positions, such as AI system maintainers, data labelers, and AI ethics consultants. At the same time, the integration of AI with other fields has given rise to emerging careers across disciplines. For example, in the medical field, the combination of AI and biotechnology has given rise to bioinformaticians and AI medical consultants. Despite the challenges posed by AI technology, its positive impact provides important opportunities for the transformation and upgrading of the labor market.

4 The Negative Impact of Artificial Intelligence on the Job Market

While Artificial Intelligence (AI) technologies have significant potential to improve productivity, create new jobs and boost economic growth, their negative impact on the job market is also a concern. The widespread use of AI could trigger the disappearance of some jobs, exacerbating the problems of job replacement and unemployment, especially for low-skilled workers.

4.1 Potential job losses due to AI

The ability of AI technology to efficiently handle repetitive tasks puts many traditional jobs at risk of being replaced. In the manufacturing industry, AI-powered robots can replace workers on production lines to complete assembly, testing and packaging. In addition, AI can replace not only physical labor, but also some mental labor. In the financial sector, AI algorithms can replace junior analysts for data analysis and report generation.

Although AI technology is currently replacing mainly repetitive and low-skill-demanding jobs, there is still uncertainty about its long-term impact. As AI technology develops further, more middle- and high-skill jobs may also be at risk of being replaced.

4.2 Occupational Substitution and Unemployment Generated by AI

The wide range of occupational substitutions by AI technologies, covering a wide range of industries such as manufacturing, services and finance, has led to increased unemployment, especially in regions with a homogenous economic structure and a low-skilled workforce. In developing countries, a large number of low-skilled workers rely on manufacturing and services for their livelihoods, and the popularization of AI technology may lead to the risk of unemployment for these workers. According to a report by the International Labor Organization (ILO), AI technologies could increase global unemployment by 1.5% to 2% by 2030.

4.3 Impact of AI on low-skilled workers

Low-skilled workers are the main victims of the negative impact of AI technologies on the job market. AI technologies mainly replace highly repetitive and low-skill-required jobs, which puts low-skilled workers at greater risk of unemployment. Low-skilled workers often lack the ability to adapt to high-skill jobs, which exposes them to skill mismatches in the AI era. Many low-skilled workers lack skills such as data analysis, programming and machine learning, making it difficult for them to adapt to the demands of emerging jobs.

5 Case Studies

When exploring the impact of Artificial Intelligence (AI) on the job market, the transformation and change of the manufacturing industry, which is an important pillar of the global economy, is particularly compelling. Foxconn, the world's largest electronics manufacturing service provider, has provided a vivid case study of how AI has reshaped the job market with its extensive use and in-depth exploration of AI technology.

In terms of productivity, Foxconn has greatly improved assembly efficiency and product quality by introducing AI-driven robots and automated production lines. According to Foxconn's internal data, since the introduction of AI technology, Foxconn's productivity has increased by about 30%, while the rate of defective products has been reduced by nearly half. While this change has greatly improved production efficiency, it has also directly led to a reduction in the demand for front-line assembly workers. Through AI algorithms, Foxconn has been able to optimize logistics paths, shorten transportation times, and reduce transportation costs, while improving supply chain transparency and traceability. While this change improves the overall efficiency of the supply chain, it also places higher skill requirements on traditional logistics planners and dispatchers.

The case of Foxconn reveals to us the dual impact of AI technology on the job market. On the one hand, the application of AI technology has indeed improved productivity and reduced costs, bringing significant competitive advantages to companies. On the other hand, the widespread application of AI has also led to the disappearance of traditional jobs. According to statistics, since the introduction of AI tech-

nology, the number of employees on some of Foxconn's production lines has decreased by about 20%. However, the application of AI technology is not all negative. With the shift in production methods, Foxconn is also actively cultivating its employees' digital skills and innovation capabilities to meet new labor demands.

6 Response Strategies

6.1 Strategies for Governments, Businesses and Educational Institutions to Deal with the Impact of AI

To meet the challenges posed by AI technology, governments, businesses and educational institutions need to take a variety of measures to mitigate the impact of AI technology on the job market and promote sustainable development of the labor market.

The Government can provide basic livelihood protection for workers affected by AI technologies by improving the social security system. In addition, the government should strengthen the regulation of AI technology to ensure that its application meets ethical and legal requirements. Formulate norms for the use of AI technology to prevent enterprises from abusing AI technology leading to mass layoffs. At the same time, the government can encourage enterprises to create more jobs, especially high-skilled jobs, through tax concessions and policy incentives.

Enterprises should invest more in vocational training for their employees to help them adapt to the needs of the AI era. Second, they can provide more career development opportunities for employees through internal job rotation and career development planning. Enterprises should also pay attention to employees' mental health and job satisfaction, and alleviate their anxiety and stress about AI technology by providing psychological counseling services and optimizing the work environment.

Educational institutions should incorporate AI-related courses into the education system, focusing on cultivating students' data analysis and programming skills. Second, educational institutions should deepen cooperation with enterprises, promote joint school-enterprise training programs, and provide students with practice opportunities and career guidance. In addition, educational institutions should advocate the concept of lifelong learning and provide flexible learning pathways for people in the workplace.

6.2 Importance of vocational training and lifelong learning

Lifelong learning has become an important trend in the career development of individuals in the age of AI. With the constant updating of technology and changes in the market, individuals need to constantly update their knowledge and skills to meet new employment needs. Educational institutions should provide students with resources and platforms for lifelong learning, such as online courses and distance learning, to help them keep abreast of the latest technology and market trends. At the same time, educational institutions should also strengthen career planning guidance for students,

helping them to clarify their career goals and formulate career development plans, so as to lay a solid foundation for their future career development.

6.3 Analyzing the Role of Social Security Systems in the Age of AI

In the age of AI, the role of the social security system has become more prominent. The social security system not only provides basic livelihood protection for the unemployed, but also provides them with re-employment training and career planning services to help them adapt to the new employment environment as soon as possible. At the same time, the social security system can also ease social conflicts and maintain social stability. In the age of AI, with the increasing risk of unemployment and social inequality, the social security system will become an important force in maintaining social stability and promoting social equity.

7 Summary and Outlook

7.1 Summary

By analyzing the dual impacts of AI technologies on the job market, this paper explores their positive effects in terms of increasing productivity, facilitating occupational transitions, and creating new and emerging occupations, while at the same time shedding light on the job disappearances, occupational substitutions, and job losses that they may lead to, especially for low-skilled workers. The paper further validates the practical application of AI technology in manufacturing and its specific impact on the job market through case studies. Finally, strategies for governments, enterprises and educational institutions to cope with the impact of AI are proposed.

7.2 Outlook

The impact of artificial intelligence technology on the job market is both a challenge and an opportunity. Through multi-party cooperation, we can fully utilize the potential of AI technology to promote the sustainable development of the labor market and build a more inclusive and equitable society. Future research needs to further explore the long-term impact of AI technology and its potential impact on social inequality, and provide policymakers, enterprises and individuals with more scientific and reasonable coping strategies.

References

1. Jia H, Zhang Q, Yao Z, et al. A review of theoretical mechanisms of artificial intelligence affecting employment[J]. American Journal of Business Administration, 2024,14(12):1712-1723.

2. Qichao Zhu, 2018: McKinsey releases AI impact assessment report, contributing an additional \$13 trillion to the global economy, Information Security and Communications Privacy Volume 10, 2018
3. Frey B C, Osborne A M. The future of employment: how sensitive are jobs to computerization? [J]. Technological Forecasting and Social Change, 2017,114:254-280.
4. Kong Weiwei, Xie Meiting. Research on the impact of artificial intelligence on employment quality: a review and outlook[J]. Learning and Exploration, 2024, (07):134-141.
5. Guo F. Reflections on the Future Development of Strong Artificial Intelligence [J]. Digital Technology and Application ,2023,41(02):73-75.

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