



From the Perspective of the Labor Market, the Opportunities and Challenges Brought by the New Generation of Artificial Intelligence Technologies Such as ChatGPT are Analyzed

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Abstract. The development of the new generation of artificial intelligence is sweeping across the world, and its impact on the labor market is becoming increasingly significant. The impact of the development of artificial intelligence on the labor market is different from other technological shocks, and its substitution effect and creative benefits are unprecedented. On the one hand, the widespread application of artificial intelligence has led to the risk of many traditional labor positions being eliminated. Automation technology and machine learning algorithms enable certain repetitive, low skilled jobs to be replaced by intelligent robots or software, which may result in some workers losing employment opportunities. On the other hand, the new generation of artificial intelligence technology has also created new employment opportunities, requiring more workers with innovative, data analysis, and collaborative abilities to cope with new challenges. Although some people face difficulties in career transformation due to skill mismatches, the rapid development of artificial intelligence technology also brings more possibilities to the labor market. Therefore, this article takes the development of new generation artificial intelligence such as ChatGPT as the starting point to analyze the changes in the labor market and future opportunities.

Keywords: artificial intelligence; ChatGPT; Labor market; Human Resource Management

1 Introduction

1.1 Research Background

The development background of the new generation of artificial intelligence (AI) can be traced back to the 1950s, but in recent years, with the improvement of computing power and the rapid increase of data, AI has been able to usher in breakthrough development. The development of modern AI benefits from advances in deep learning, big data, cloud computing, and computing power.^[1]

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Deep learning is the core technology of the new generation of AI, which is based on the concept of artificial neural networks and uses multi-level neural network structures for pattern recognition and data analysis. The development of deep learning benefits from the availability of big data and the improvement of computing power, enabling systems to learn from massive data and extract features and patterns.^[2]

At present, the development of the new generation of AI has achieved significant results in many fields. Natural Language Processing (NLP) enables machines to understand and process human language more naturally and accurately, driving the development of applications such as intelligent assistants, machine translation, and sentiment analysis. Computer vision technology (CV) enables machines to recognize and understand image and video content, achieving breakthroughs in areas such as facial recognition, object detection, and autonomous driving. The application of machine learning and data mining technology has brought about the development of personalized recommendations, public opinion analysis, and financial prediction applications.

In addition, the new generation of AI has also been widely applied in fields such as medical diagnosis, smart cities, and industrial automation. AI technology not only improves productivity and efficiency, but also brings new business models and innovation opportunities. The development of AI has become a strategic focus for governments and enterprises around the world, and many countries have introduced AI development plans and policies to promote the rapid growth of the AI industry.^[3]

Although the new generation of AI has made remarkable progress, it still faces some challenges, such as data privacy and ethical issues, algorithm inexplicability, and fairness. The future development needs to address these issues and strengthen the sustainable development, human-machine collaboration, and social equity of AI technology to achieve its maximum potential and social value.^[4]

1.2 Research Meaning

Firstly, this study can predict the impact of artificial intelligence technology on different industries and professions to determine which jobs will face risks and which will bring new opportunities. This helps governments and businesses make strategic decisions to respond to changes and plan for the future labor market. At the same time, research can also promote innovation in skill development and vocational training to meet the needs of new technologies and improve the competitiveness of workers. Understanding the impact of artificial intelligence technology on skill demand can help reduce the risk of unemployment and job loss. In addition, the study also reveals the social inequality and exclusion issues that artificial intelligence technology may bring. This insight can provide reference for policymakers to formulate relevant policies and regulatory measures, ensuring that the development of next-generation artificial intelligence technology is coordinated with the fairness and sustainable development of the labor market. In summary, studying the impact of the development of the new generation of artificial intelligence on the labor market is of great significance. It provides us with opportunities to insight into future trends, guide decision-making, promote skill development, and ensure social equity. This kind of research is a key link in achieving the healthy development of intelligent society and labor market.^[5]

2 From the Perspective of Labor Supply

2.1 Changes in Industry Development Trends

With the widespread application of AI technology, some traditional positions are gradually disappearing or being replaced. For example, in the manufacturing industry, automated robots have replaced some of the work on manual production lines; In the field of customer service, intelligent voice response systems have gradually replaced manual customer service. These changes have led to a reduction in some traditional positions, but at the same time have also given rise to new job opportunities, such as AI algorithm engineers and data scientists.^[6]

The development of AI has put forward new requirements for the skills of workers. Traditional physical labor and simple repetitive work are gradually being replaced by machines, while abilities such as data analysis, innovative thinking, and interdisciplinary knowledge have become new favorites in the job market. This means that workers need to constantly update their knowledge system and improve their skills to adapt to the new employment environment. The popularization of AI has also led to the adjustment of salary structure. On the one hand, the salary levels of some positions replaced by AI technology may decrease; On the other hand, the salary levels for positions that require high professional skills and innovative abilities may increase. This adjustment of salary structure further exacerbates the inequality in the job market.

Although AI technology may lead to the disappearance of some traditional jobs, it also spawns new job opportunities and demand. The development, application, and maintenance of AI technology require professional technical talents, including data scientists, machine learning engineers, algorithm experts, etc. In addition, software development, hardware manufacturing, data network security, and other fields that are compatible with AI technology will also increase employment opportunities.^[7]

The development of the new generation of artificial intelligence has had a substitution effect on labor demand, which includes both the substitution of traditional positions and the creation of new types of positions. This substitution effect has had a profound impact on the job market and socio-economic development.

2.2 The Substitution Effect of Labor Demand

First, the development of AI technology creates new jobs. With the in-depth application of AI technology, such as data analysis, machine learning, natural language processing and other fields, the demand for relevant professional and technical personnel is growing. These positions usually require a high level of skill and innovation, providing new employment opportunities for workers.

Second, the development of AI technology has changed the nature of existing jobs. Many jobs that once required direct human involvement, such as customer service and quality inspection, can now be automated through AI technology, reducing the need for human labor in these roles. However, this also means that new skills are needed to adapt to these changing roles, such as data analysis, programming, etc.^[8]

In addition, the development of AI technology increases labor productivity and promotes innovation, which has a positive impact on the job market. Through automation and intelligent technology, people can complete tasks more efficiently, saving costs for enterprises and improving efficiency. Such technological change will help create more economic growth points and increase job opportunities in emerging industries and creative industries.

2.3 Changing Skill Demand

For The rapid progress of the new generation of AI technologies is having a profound impact on the labor market, especially in terms of skill demand.

The development of artificial intelligence and machine learning technology has enabled many repetitive and procedural tasks to be automated. This has led to a decrease in demand for simple labor and a significant increase in demand for higher cognitive skills such as creative thinking, complex problem solving, and critical thinking. Therefore, the workforce needs to adapt to this shift and enhance these capabilities through education and continuous learning. With the integration of AI technologies, there is a growing demand for expertise in programming, data analytics, machine learning, and other technical areas. These roles typically require knowledge of software, programming languages and tools, as well as the ability to interact with and interpret complex data. Workers must be committed to understanding and mastering these new tools in order to be able to survive and thrive in the new labor environment influenced by AI. Although AI has made great strides in processing logic and data, current AI is still no match for humans when it comes to interpersonal communication and emotional expression. As a result, occupations that involve strong human interaction, such as nursing, education, and counseling, may see relatively less automation and an increased emphasis on these skills. The workforce's skills in these areas, particularly empathy, communication, and leadership, will become even more valuable. Due to the continuous emergence of new technologies, the skills required are changing rapidly.^[9] This requires a workforce that not only has the ability to learn new skills, but also the flexibility to adapt to changing circumstances. Lifelong learning and self-renewal have become particularly important, and individuals need to be ready to broaden their skill sets to adapt to the changes in what and how they work as a result of emerging technologies. As the influence of AI decisions grows, so does the need for moral judgment and accountability. This includes ethical considerations in the face of complex data and AI recommendations, as well as the ability to take accountable action in the event of errors or biases. As a result, the workforce will need to be able to make thoughtful decisions, especially when it comes to issues such as law, privacy and social responsibility.

In short, the new generation of artificial intelligence technology is driving the transformation of the skills needs of the workforce. Modern workers will need to develop new skills over time, while strengthening and enhancing unique human capabilities that AI cannot replace. Such developments present challenges to individual career planning and education systems, as well as opportunities to foster innovation and personal professional growth.

3 The Problems and Countermeasures Brought by the Rise of Artificial Intelligence

3.1 Changes in Skill Requirements

In the rapidly developing new generation of artificial intelligence technology, the demand for various key skills in the labor market is increasing. Firstly, in the field of computer science, workers need to possess a wide range of programming skills, covering various programming languages such as Python, Java, C++, etc. In addition to mastering basic syntax, they also need to have a deep understanding of data structures and algorithms, which is crucial for building efficient artificial intelligence systems and processing large-scale data. In terms of data analysis, workers need to be able to use data processing tools such as SQL and Excel for data cleaning and organization.^[10] At the same time, they need to be proficient in using data visualization techniques such as Tableau and Matplotlib to present data in a form that is easy to understand and analyze.

In addition, skills in artificial intelligence technology are also highly valued. Workers need to master machine learning and deep learning algorithms that can be applied to tasks such as model training and data prediction. In addition, it is necessary to have an understanding of the basic principles and technologies in fields such as natural language processing and computer vision, and be able to apply these technologies in fields such as text analysis and image recognition. In addition, communication skills and teamwork skills are particularly crucial. Workers need to be able to effectively communicate and collaborate with interdisciplinary team members, solve complex problems, and drive the successful implementation of projects. In the rapidly developing field of technology, cultivating problem-solving and innovative thinking abilities is also crucial, which helps workers better adapt to the constantly changing work environment and market demands. Through continuous learning and skill enhancement, workers can better cope with the challenges in the labor market, expand their career development possibilities, and embrace the opportunities brought by the new generation of artificial intelligence technology.

3.2 Changes in Industry Structure

When new technologies are introduced into the workplace, the pattern of the labor market changes accordingly. Traditional industries may reduce their demand for labor under the influence of automation and intelligence. This transformation may lead to some job positions becoming outdated, and workers may need to adapt to the arrival of new technologies and instead seek new jobs that suit their skill set. Meanwhile, emerging industries may have a high demand for new technology talents due to the widespread application and popularization of new technologies. These emerging industries, such as artificial intelligence, big data analysis, and the Internet of Things, typically require talents with strong technological backgrounds and innovative capabilities to drive industry development. Therefore, workers need to constantly adjust their skills and knowledge structure to meet the demand for new technology talents in emerging industries.^[11]

For traditional industry workers affected by automation and intelligence, they may need to reposition their career development direction and seek new job opportunities that suit their skills and interests. This may include enhancing one's employment competitiveness through learning new technologies, participating in training, and other means. At the same time, the government and enterprises also need to be committed to providing career training and reemployment opportunities to help these workers smoothly transition to emerging industries or roles.

For emerging industries, with the continuous progress and development of technology, their demand for talents with professional knowledge and skills in new technologies will continue to grow. Therefore, workers should continuously update their technical knowledge and maintain their ability to keep pace with industry development. Continuous learning and self-improvement will help workers adapt to the high demand for technical talents in emerging industries, enhance their competitiveness in the labor market, and expand new career opportunities. The sustained development of these skills and knowledge will also make the labor market more dynamic and help drive economic development and innovation.

3.3 Labor Market Differentiation

The popularization of the new generation of artificial intelligence technology may lead to the phenomenon of labor market differentiation. Workers who possess skills and professional knowledge related to artificial intelligence technology are often more likely to receive better job opportunities and compensation. These skills include professional skills in fields such as computer programming, data science, machine learning, and deep learning. As emerging industries increasingly require these professionals to drive innovation and development, workers with relevant skills will be more favored by the market.

On the contrary, workers who lack skills related to artificial intelligence technology may be more affected. Traditional low skilled jobs may be impacted by automation and intelligent technologies, leading to a decrease in demand for these jobs. This may cause some employment opportunities to gradually disappear, bringing employment pressure to workers who lack relevant skills. They may need to reposition their career direction or acquire new skills through training and learning to adapt to market demands.

Therefore, the differentiation of the labor market may exacerbate the skill gap, leading to differences in income and employment opportunities among workers at different levels. Workers with relevant skills are likely to be more likely to obtain high paying and skilled jobs, improving their employment stability, while those lacking relevant skills may find themselves in a more competitive and unstable employment environment. Therefore, for workers, continuous learning and skill enhancement are particularly important in order to adapt to technological development and changes in the labor market, improve their competitiveness, and obtain better employment opportunities and compensation. The government and enterprises can also help workers adapt to new technological trends and job market demands by providing training and educational resources, alleviating the risk of labor market differentiation.

3.4 Retraining and Lifelong Learning

The emergence of new technologies poses a challenge to the labor market for supply side workers to continuously learn and improve their skills. Faced with technological changes and constantly changing market demands, workers need to receive retraining and lifelong learning to adapt to the new situation of the labor market. The supply side labor force needs to maintain a keen observation ability to understand the market's demand for new technologies and skills, in order to adjust their career development direction and learning plans.

By receiving retraining and lifelong learning, workers can continuously improve their skill levels to meet the urgent market demand for new technologies and abilities. This continuous learning process helps workers maintain competitiveness and employment stability. For traditional industry workers who are impacted by new technologies, retraining and learning new skills means they can have opportunities for transformation and find jobs that meet market needs. This helps to alleviate the impact of technological transformation on the labor market, improve employment opportunities and survival capabilities of workers.

Meanwhile, lifelong learning is also crucial for workers in emerging industries. In the rapidly developing field of technology, continuously improving skill levels, following industry trends, and constantly learning new knowledge will help these workers stand out in fierce competition. Adapting to new technological changes and continuously improving skill levels not only helps workers achieve greater success in their career development, but also has the potential to improve the overall quality and competitiveness of the labor market.

Therefore, the supply side labor force needs to actively embrace change, continuously learn and improve skills to adapt to the changes brought about by new technologies and the changing demands of the labor market. Governments, enterprises, and educational institutions should also provide more training and educational resources to support lifelong learning for workers, help them adapt to technological progress and changes in market demand, and promote the healthy development of the labor market.

4 Conclusion

When facing the impact of the new generation of artificial intelligence technology on the labor market, enterprises need to actively invest in employee skill training and transformation plans to help employees adapt to new technologies and improve production efficiency. In addition, enterprises should also attach importance to talent recruitment and retention, provide employees with development opportunities and welfare measures to attract talents, in order to maintain competitiveness and sustainable development. At the same time, it is recommended that enterprises establish technology innovation teams, focus on new technology research and innovation, promote technological progress and application, and improve their position and competitiveness in the industry.

At the individual level, individuals need to continuously learn and improve their skills to adapt to the development needs of new technologies. Individuals should

develop career development plans, understand industry trends and required skills, adjust their development direction in a timely manner, and prepare for future career transformation. In addition, participate in industry communities and networks, communicate and interact with experts and peers in the field, obtain new technology information and development trends, and continuously pursue progress.

At the social level, the government and educational institutions should support technical education and training programs to help workers transition and adapt to the arrival of new technologies, promote talent cultivation, and alleviate skill matching issues. In addition, society should encourage career transformation and innovation and entrepreneurship, provide workers with transformation opportunities and resource support, promote the development of new formats and cultivate innovation capabilities. At the same time, it is recommended to establish a technology exchange platform and knowledge sharing mechanism to promote technology exchange, cooperation, and application, promote the dissemination and application of technical knowledge, and promote industrial upgrading and development.

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