

Analysis of the Impact of Artificial Intelligence Development on Employment

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Abstract—In recent years, artificial intelligence has developed rapidly and gradually integrated into all aspects of citizen life. The development of artificial intelligence has not only promoted the transformation and upgrading of the economy and society, but also has a huge impact on the employment structure. This article sorts out the development process of artificial intelligence, summarizes the impact of artificial intelligence on employment, and then proposes measures to deal with the impact of artificial intelligence on employment.

Keywords—artificial intelligence; employment

I. INTRODUCTION

Artificial intelligence (AI) is a new technical science that researches and develops theories, methods, technologies and application systems for simulating, extending and expanding human intelligence. AI is a branch of computer science that attempts to understand the essence of intelligence and produce a new kind of intelligent machine that can respond in a similar way to human intelligence. Research in this area includes robotics, language recognition, image recognition, Natural language processing and expert systems.

Artificial intelligence has been widely developed in the computer field, and has been applied in commercial marketing, speech recognition, deep learning, P2P networks, and image recognition systems. In employment, it has penetrated into all walks of life. Some previous new technologies are often limited to specific fields and industries and cannot be used across industries, so their impact on employment is quite limited. But artificial intelligence technology is different. It is more versatile and covers a wider range of industries in people's employment. Some industries even face the situation of being replaced by artificial intelligence. Today's artificial intelligence is also a hot research area and one of the topics that scholars pay close attention to.

II. THE DEVELOPMENT OF ARTIFICIAL INTELLIGENCE

In 1956, the Dartmouth Conference was held, and the concept of artificial intelligence was proposed, marking the birth of artificial intelligence. During this period, the trend of artificial intelligence research in the international academic community rose and academic exchanges were frequent. In the 1960s, connectionism and complianceism, as the main genre, went into depression. Due to insufficient hardware capabilities

and algorithmic defects, artificial intelligence technology fell into a sluggish development period. In the 1970s, backpropagation algorithms began to be researched, computer costs and computing capabilities were gradually increased, research and application of expert systems were difficult to advance, and artificial intelligence gradually began to make breakthroughs. In the 1980s, back-propagation neural networks were widely recognized, and research on algorithms based on artificial neural networks advanced by leaps and bounds, and computer hardware capabilities increased rapidly. In addition, the development of the Internet reduced artificial intelligence computing costs and artificial intelligence developed steadily. In 2006, deep learning was proposed, and artificial intelligence once again achieved breakthrough development. In the first decade of the 21st century, the development of mobile Internet has brought more application scenarios for artificial intelligence. In 2012, deep learning algorithms achieved breakthroughs in speech and visual recognition.

Artificial intelligence, as a groundbreaking research and a theoretical method and technology applied to the simulation and extension of human intelligence, is a science of applied systems science. It has become one of the three cutting-edge technologies of the 21st century and has a high level of knowledge and technology. Characteristics such as low consumption of material resources, high production efficiency, large growth potential, and wide developable fields, are now becoming the core driving force of a new round of industrial reform, and will further release the huge energy accumulated in previous scientific and technological revolutions and industrial changes, creating New powerful engine. Therefore, all countries in the world are actively exploring artificial intelligence to play a greater role in economic and social production in the process of occupying a new round of economic and technological commanding heights [1].

III. THE IMPACT OF ARTIFICIAL INTELLIGENCE ON EMPLOYMENT

Artificial intelligence can replace both physical and mental labor. This "universal" feature is not possible with previous scientific and technological revolutions. BCG Ali Research Institute has published a set of data. Within the next 5 years, 7.1 million jobs will disappear due to the arrival of the era of artificial intelligence. 702 occupations and 47% of jobs may be replaced by artificial intelligence. At the same time, for every

robot deployed, 3.6 new jobs are created. While technological progress promotes employment growth, it will also have a negative impact on full employment, leading to a dilemma in macroeconomic policies [2].

A. The Substitution Effects of Artificial Intelligence on Employment

Substitution effects of artificial intelligence on social employment structure Artificial intelligence technology is being widely used in various fields, from better medical care to more personalized education, from more efficient retail and manufacturing to autonomous vehicles. The World Economic Forum had predicted that by 2020, the development of artificial intelligence would reduce humanity by 5 million jobs. This will lead to a large number of technological unemployment in the future. The so-called technological unemployment is unemployment caused by technological progress. In short, it means that more and more advanced equipment replaces human labor in the production process, resulting in increased unemployment.

(1) Many single-skilled occupations, cumbersome labor, especially some procedural, routine jobs or precision jobs that cannot be handled manually may be replaced by machines.

(2) Not all relatively low-end jobs have been replaced by artificial intelligence. For example, in terms of data processing, human performance is not as good as artificial intelligence. In addition, some general companies write copywriting, review legal contracts, audit, and check medical images. In the future, automated operations may replace office and administrative staff, medical secretaries, and lawyers. Assistant, mechanical information processing processing post.

According to a 2017 McKinsey study, China's employment substitution risk rate is about 51.2%, compared with 45.8% in the United States, and 51% of China's jobs with potential for automation are concentrated in medical, transportation, industrial, and living services. According to PwC research, artificial intelligence and related technologies will replace about 26% of China's existing jobs in the next 20 years, which is higher than the 20% estimate for the UK.

B. The Creative Effects of Artificial Intelligence on Employment

Although the new technological revolution will destroy some traditional jobs, the new employment opportunities it brings will grow at a faster rate and the total number of jobs will also increase. The high application of artificial intelligence will improve the quality of human life and change the human life pattern. The use of new technologies will not only improve work efficiency and promote the development of productivity, but will also have a decisive impact on labor, employment and even social systems.

First of all, the rapid development of artificial intelligence can bring more new jobs because it efficiently promotes social and economic development. With machines handling tedious and trivial tasks for humans, humans can better focus on creative work that only humans can do. Secondly, the development of artificial intelligence has improved work

efficiency, increased additional demand and reduced costs. Finally, the development of artificial intelligence has caused new business paradigms and new business formats in the form of employment, which will lead to new forms of employment, which will significantly increase the proportion of flexible employment and flexible employment in the society. At present, the development of Internet technology applications and the development of the platform economy have led to diversified working methods. The proportion of employment such as flexible employment, flexible employment, and sharing economy has increased significantly. The phenomenon of "gig economy" and "independent workers" have emerged as the times require [3].

According to PwC's research, the application and promotion of artificial intelligence technology will create more and a lot of new employment opportunities. The net impact of artificial intelligence on China's employment will increase net employment by 90 million in the next 20 years, creating About 12% of net job creation. Job recruitment data on Zhilian and other Internet recruitment websites show that the demand for artificial intelligence increased by 179% year-on-year in the first quarter of 2017, which is nearly three times the 2016 demand for talent.

C. The Polarization Effects of Artificial Intelligence on Employment

Many international scholars believe that the employment structure of the labor force is showing a polarizing trend. The demand for high-income cognitive work and low-income manual work continues to increase, with the consequent decrease in routine work at middle income, and workers at lower and middle income levels face greater risks of job replacement.

Investigate the reasons for employment polarization: On the one hand, it is because of the difference in the nature of work. Artificial intelligence mainly replaces repetitive, stylized work tasks, and these tasks are mainly concentrated in middle-income jobs. In addition, according to cost-benefit analysis, the benefits of being replaced by middle-skilled labor are higher and technically more feasible, so middle-income workers will be replaced first. However, a certain creative, non-stylized work task cannot be easily replaced in the short term. Therefore, the impact of artificial intelligence on employment is polarized. On the other hand, the substitution of artificial intelligence for middle-income jobs has formed a squeeze on middle-income workers. Middle-income workers have shifted to high-income and low-income jobs, and the number of high- and low-income labor has increased.

In addition, technological progress has also created a direct demand for highly skilled labor, which has resulted in a polarization effect on employment. In the near future, as the level of technology continues to improve and the application of artificial intelligence becomes more widespread, the phenomenon of employment polarization may change. The substitution of artificial intelligence for employment not only involves middle-income workers, but also replaces low-skilled workers to a greater extent, but for high-skilled workers, it is still the least vulnerable to artificial intelligence [4].

IV. THE COUNTERMEASURES TO THE IMPACT OF ARTIFICIAL INTELLIGENCE ON EMPLOYMENT

A. *Narrowing the Substitution Effects of Artificial Intelligence on Employment.*

On the one hand, it is necessary to stimulate the entrepreneurial spirit of adventure and pioneering spirit, combining the personal characteristics of entrepreneurs and the sensitive sense of smell, to break through the stubbornness of existing technologies, and on the basis of existing technology, actively provide the supply of high-end products and services around technological progress, by extending the industry Chain, enhance product added value, enrich product types, and explore new fields, etc., to increase employment positions and promote employment levels; on the other hand, it is necessary to improve the comprehensive quality and ability of workers, and establish a sound vocational education system to carry out forward-looking vocational skills training. In order to adapt to the continuous development of artificial intelligence, to enhance the irreplaceability of its own work.

B. *Amplifying the Creative Effects of Artificial Intelligence on Employment*

Scientifically analyze the impact of artificial intelligence on employment structure, and actively carry out artificial intelligence monitoring and evaluation of employment substitution. First of all, increase the pre-judgment of the application of artificial intelligence technology, and promote the application of artificial intelligence in a planned and organized manner. Within the overall framework, give full play to market functions and reorganize and rebuild jobs. Second, respect the law of industrial evolution, focus on the upgrading and application of artificial intelligence, vigorously promote innovation and entrepreneurship, and cultivate emerging industrial carriers supported by artificial intelligence. Third, improve urban development planning and provide incubation and accelerated development guarantees for artificial intelligence in space. In terms of policy, encourage and support the transfer of labor to the new form of artificial intelligence [5].

C. *Cultivate Professionals in Artificial Intelligence*

Facing the tide of the development of artificial intelligence, we are actively building platforms to strengthen the introduction and training of artificial intelligence talents. In response to the challenges and requirements of artificial intelligence on employment, deepen the reform of the talent system and mechanism, make overall use of existing talent policies such as the "Thousand Talents Plan", rely on various incubators and acceleration spaces, and attract and cultivate high-end artificial intelligence talents and Innovative and entrepreneurial talents. Utilize the industrial platform, encourage school-enterprise cooperation, support relevant universities to strengthen the construction of artificial intelligence-related disciplines, guide vocational schools to cultivate skilled talents urgently needed for industrial development, build a talent system at different levels, and cultivate more types that meet the needs of artificial intelligence development Talent. Encourage enterprises and industry service agencies to accelerate the establishment of

new-type talent training and promotion plans, improve related mechanisms, and train and create a number of composite talents and teams that master artificial intelligence applications.

D. *Improve Employment Service System*

Relying on existing human resources service companies such as job information networks and third-party job hunting and headhunting, on the basis of improving and perfecting the labor market information network and service system, establishing enterprise recruitment positions and professionals closely related to robotics and other technologies Professional information platform for job search and high-quality labor force re-employment to strengthen the service function of talent information platform. Where possible, local organizations are encouraged to develop robots, artificial intelligence and other talents and demand mapping work to form a national database. Standardize and improve the labor market service capabilities, strengthen the collection of information on the demand for low- and mid-end positions in enterprises and public services, and actively and effectively connect the low- and mid-end labor transfer jobs. Efforts should be made to strengthen career guidance, to indicate future positions and new employment directions for potential laborers who are adaptable to robotics, and to point out new outlets for laborers who are temporarily unsuited to new technologies. An effective linking system of career guidance-employment information-career introduction will be formed to reduce Costs of transfers and searches.

E. *Play the Role of Market Regulation Mechanism*

In the process of artificial intelligence affecting social employment, the market has played a very good regulatory role. It is the normal operation of the market mechanism that transforms the damaging effects of artificial intelligence on social employment into long-term positive effects. Under the conditions of China's socialist market economy, in order to give full play to the role of the market, it is necessary to use both tangible and intangible hands to maintain sufficient flexibility in the labor employment system and labor market. The government should attach importance to and take active measures to carry out macro-control, encourage workers to maintain professional vitality, and use various forms to realize reemployment. Workers must change their employment concepts, and strive to continuously improve their own qualities through hard work to learn scientific and cultural knowledge and vocational technology, and reduce the risk of permanent unemployment. The replacement of social jobs by technology not only does not mean a "disaster" for workers, but also a great liberation of the labor force, which will ensure the rights of workers more fully, so there is no need to worry too much about the severity of unemployment.

F. *Improve the Social Security System*

Make full use of big data, build a comprehensive national employment information monitoring platform, monitor real-time employment changes in key regions, key populations, and key positions, release employment status information regularly or irregularly, provide employment warnings, forecasts and predictions, Employment.

Modify and improve the social security system in a timely manner to protect the employment social problems that may arise from the rapid development of AI. The industrial revolution represented by AI, sharing economy, Internet technology, and related industries has made employment forms increasingly decentralized, diversified, fluid, and informal. However, the existing relevant laws and regulations lack clear regulations and definitions for flexible employment, which leads to the inability of practitioners to obtain effective legal protection, and there is a gap between formal employment and social security and social welfare. The rapid development of new technologies may bring potential large-scale unemployment risks. It is necessary to establish a comprehensive social security system and unemployment support policies to avoid social problems caused by the possible social risks brought by unemployment and the widening gap between the rich and the poor [6].

V. CONCLUSIONS

There are still many restrictions on the development of artificial intelligence technology. At present, it can only replace some of the more dangerous and repetitive manual labor. In the future, artificial intelligence will not completely replace human employment, and will cooperate with humans, so that workers can focus more on intellectual work. The situation of artificial intelligence's full-scale and large-scale replacement of human jobs will not happen in a centralized manner. At the same time, with the development of artificial intelligence, the industries it drives will also create a large number of new jobs for people, such as the service industry and more creative jobs. Artificial intelligence has also improved the quality of employment and the work experience, and changed the job structure. In the future, there will be greater demand for workers in intellectual labor. Simple physical and mental labor may be replaced by artificial intelligence. However, the challenges and opportunities brought by artificial intelligence should still be actively addressed. For jobs affected and impacted by artificial intelligence, timely organize their participation in new jobs, such as the emerging service industry jobs brought by the

artificial intelligence environment. People need to improve their knowledge reserves and innovation capabilities, and apply innovative thinking to their work. Through the construction of talent training systems and other methods, train more intellectual workers, and give full play to human unique creativity in their work. Better adapt to new employment methods in the new environment [7].

The development and application of artificial intelligence technology is unstoppable, and it will inevitably promote the development of human industrial civilization to a higher level. Starting from China's current economic and industrial development and employment, we must play the role of artificial intelligence, improve employment structure, and increase industrial competitiveness. To meet the challenges of the new industrial revolution and the era of artificial intelligence [8].

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