Financial Engineering and Risk Management (2024)
Clausius Scientific Press, Canada

DOI: 10.23977/ferm.2024.070419
ISSN 2523-2576 Vol. 7 Num. 4

Innovation of Artificial Intelligence Technology and Coordinated Development of Regional Economy

Chengbo Jin

Heilongjiang Weizhong Investment Group Co., Ltd, Harbin, 150000, China

Keywords: Artificial intelligence; technological innovation Regional economy; coordinated development

Abstract: With the rapid progress of technology, artificial intelligence (AI) technology is flourishing globally, especially in China, where its innovative applications have taken the lead in the world. AI,as a leader in the new round of technological revolution and industrial transformation, we are reshaping our economic landscape and social life. The deep integration and application of AI provide strong impetus for regional economic collaborative innovation. In the era of smart economy, the perfect combination of big data, Internet information technology and AI has injected unprecedented vitality into regional economic development. These advanced technologies not only optimize the traditional industrial structure, but also give birth to many new formats and models, resulting in a diversified and high-quality development trend in the economy of various regions in China. This article delves into the inherent connection between AI technology innovation and coordinated regional economic development. The widespread application of AI not only improves production efficiency, but also plays a positive role in promoting employment and improving people's livelihoods. At the same time, driven by AI, regional economies are gradually shifting from traditional resource dependence to technological innovation, which will undoubtedly lay a solid foundation for the long-term development of the Chinese economy.

1. Introduction

In the wave of globalization, technological and industrial revolutions are advancing at an unprecedented speed, constantly shaping new international competitive and industrial development patterns [1]. In this booming context, a series of emerging technological fields such as big data, supercomputing, pattern recognition, sensor networks, and neuroscience have emerged like mushrooms after rain. Their birth and progress mark a new level of human technological civilization [2]. Among these emerging technologies, AI is undoubtedly the most dazzling star. With its unique charm and unlimited potential, it has attracted the attention of the world and become a strategic technology that leads future development. At the same time, it is also the core driving force for a new round of industrial transformation [3]. AI, As an important branch of modern technology, its research and application have penetrated into various fields of human society, from healthcare, education, transportation to finance, manufacturing, and so on, almost everywhere [4]. It is changing people's production and lifestyle, reshaping the operation mode of

various industries with its powerful data processing ability, precise decision analysis ability, and efficient automation execution ability [5].

With the continuous maturity of technology and the expansion of application scenarios, AI is becoming an important force driving social progress and economic development [6]. In the era of smart economy, innovation is the core driving force for promoting economic development [7]. The innovation and application of AI technology is an important feature of this era. It provides strong support for the innovative development of regional economy with its unique advantages [8]. Through the collection and analysis of big data, AI can accurately grasp market demand and changing trends, providing scientific basis for the strategic positioning of regional economy; Through the connection between the Internet and the Internet of Things, AI can realize the optimal allocation and efficient use of resources, and improve the competitiveness and efficiency of regional economy; Through intelligent and automated production processes, AI can significantly improve production efficiency and product quality, promoting the optimization and upgrading of industrial structure [9].

In addition, we also need to pay attention to the impact and changes of AI technology development on regional economy [10]. On the one hand, we need to pay attention to its positive impact, such as improving production efficiency, optimizing industrial structure, promoting employment, etc; On the other hand, we should also be vigilant about the potential negative impacts it may bring, such as data security, privacy protection, employment impact, and other issues [11]. Therefore, we need to establish a scientific and reasonable measurement index system to comprehensively and objectively evaluate and analyze the relationship between AI technology innovation and regional economic development. This will help us better grasp the development trends and application prospects of AI technology, and provide strong support for the sustainable development of regional economy. In the context of a new round of global technological and industrial revolution, we need to fully recognize the importance and potential of AI technology, and take effective measures to promote and apply it. Only in this way can we stand invincible in global competition and achieve sustained and healthy development of regional economy.

2. The Impact and Role of AI on Regional Economy

2.1. Impact

The innovation of AI technology is increasingly becoming an important driving force for regional economic growth [12]. Its innovation not only replaces outdated production factors, but also greatly improves economic efficiency and helps the transformation and upgrading of traditional industries [13]. These changes have significantly promoted economic growth at the macro level. Specifically, in China, the driving effect of AI technology on regional economies is particularly evident [14]. The eastern and central regions, as leading areas for economic development, have fully experienced the benefits of technological progress [15]. In these regions, AI technology not only optimizes production processes, but also promotes the emergence of new industries and formats, thereby achieving sustained and stable economic growth [16].

As shown in Table 1, the economic development trend of a certain city in China showed a significant upward trend from 2018 to 2022. Behind this is the widespread application and deep integration of AI technology in various economic fields. From the intelligent transformation of manufacturing industry to the digital upgrading of service industry, to the precise management of agriculture, AI technology is playing an indispensable role. In the future, with the continuous progress and application of AI technology, we have reason to believe that it will continue to inject new vitality into regional economic growth and promote China's economy to achieve higher quality development.

Table 1: Economic development trends of a city

Age	City wide gross domestic product/billion	Total retail sales of consumer goods/billion
2018	3004.8	1054.1
2019	3917.3	1389.5
2020	4529.5	2014.7
2021	5014.8	2789.3
2022	5781.6	3971.5

2.2. Role

The role of AI in regional economy is becoming increasingly significant, mainly due to the continuous development of various machine learning (ML) algorithms and the significant improvement of AI products in solving practical problems. In commercial applications, the application of AI technology has penetrated into various industries and fields, bringing profound impacts to the regional economy. Firstly, AI technology can extract valuable information from massive data by using computer learning algorithms, providing scientific basis for business decision-making. AI technology can deduce a set of intelligent decision-making rules for target machine equipment and control systems, enabling AI products to simulate the thinking process of the human brain and replace manual automation operations. This not only improves production efficiency and reduces labor costs, but also brings higher economic benefits to the enterprise.

Secondly, the development of AI technology has given birth to many new products and services, from smart home devices to virtual reality applications, from smart city solutions to online education platforms. These emerging products and services continue to expand the boundaries of the market and inject new vitality into the regional economy. The emergence of these new products and services not only meets the growing needs of people, but also drives the development of related industrial chains and promotes the prosperity of regional economy. In addition, AI technology can also help enterprises more accurately monitor, control, and improve product production processes. By applying AI technology, enterprises can collect and analyze production data in real time, identify problems in the production process in a timely manner, and make adjustments, thereby improving product quality and reducing defect rates. This not only enhances the competitiveness of enterprises, but also brings consumers a better product experience.

3. Suggestions for Collaborative Development of AI Technology Innovation

3.1. Build a Regional Economic Innovation System

When constructing a regional economic innovation system mechanism, we should take a global perspective and fully leverage the leading role of the government. Firstly, through in-depth research and close integration with local characteristics and advantages, strategic planning should be formulated according to local conditions to ensure that the positioning of features is not only in line with regional realities, but also forward-looking and competitive. In terms of mechanism design, we should closely focus on the strategic positioning of regional economic development, rely on advanced big data technology, and build an open science and technology innovation information platform. This platform will become a link connecting innovative resources from all parties, effectively integrating diversified R&D resources and forces such as universities, research institutes, and innovative technology enterprises. In order to create a positive environment for technological innovation, we need to establish a sound platform for trading scientific and technological

achievements, and formulate a series of favorable institutional systems, such as "policy+finance" support policies, to stimulate the enthusiasm and creativity of all parties involved in innovation.

At the same time, we should scientifically design mechanisms to accelerate the transformation of innovative achievements, ensure that industry university research achievements can be quickly transformed into practical applications, and provide a continuous source of power for regional economic development. Through this series of measures, we will create an efficient regional economic and technological innovation industry ecosystem, making innovation the core engine driving the rapid development of the regional economy. The detailed framework of the mechanism design for regional economic innovation system is shown in Figure 1, which demonstrates how we can effectively integrate various innovative elements through systematic planning and layout, injecting new momentum into the sustainable development of the regional economy.

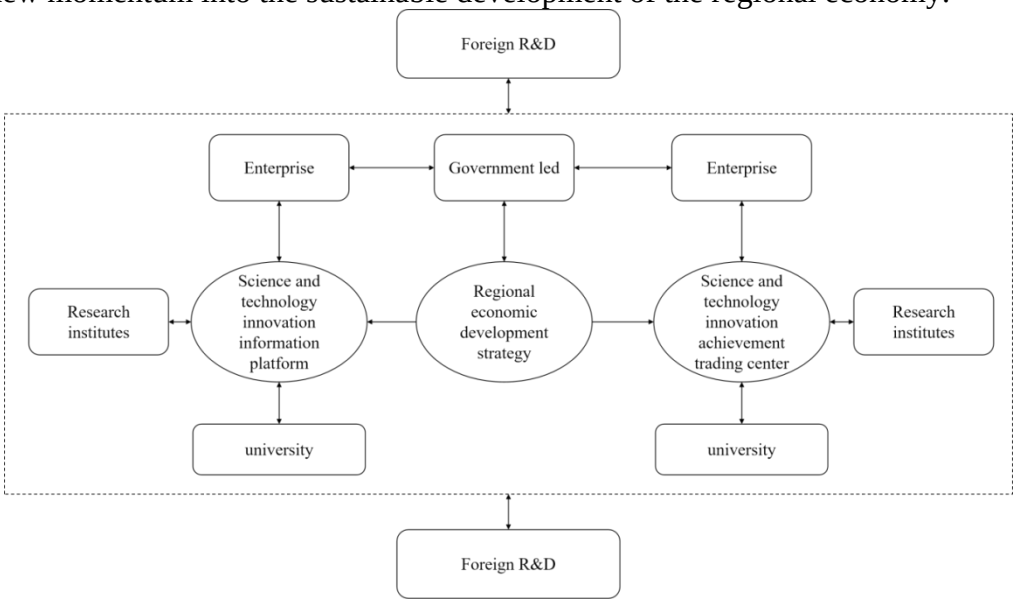

Figure 1: Mechanism of regional economic innovation system

3.2. Strengthen Talent Cultivation and Financial Support

To promote the widespread application and industrialization of AI technology, we must strengthen talent cultivation and financial support. Firstly, improving the supply of high-quality AI talents is crucial. This means that we need to build a comprehensive education system, including adding relevant subject courses, introducing internationally advanced textbooks and educational methods, and encouraging deep integration of industry, academia, and research to provide students with more practical opportunities. In addition, we should increase the introduction of outstanding talents in the field of AI, provide them with favorable treatment and a good working environment, and attract more talents to join the AI industry.

At the same time, strengthening the financial system's services and support for AI enterprises is also indispensable. Financial institutions should have a deep understanding of the characteristics and needs of AI enterprises, provide tailored financial services such as loans, financing, insurance, etc., and help these enterprises solve their funding problems and reduce innovation risks. In addition, the government should also introduce relevant policies to encourage financial institutions to increase investment in the field of AI, providing a solid financial support for the development of AI enterprises. In short, by increasing the supply of high-quality AI talents and strengthening the financial system's services and support for AI enterprises, we will provide strong guarantees for the widespread application and industrialization process of AI technology. This will help promote

high-quality development of regional economy and enhance China's competitiveness and influence in the global AI field.

4. Conclusions

In the era of smart economy, the rapid rise of big data, AI, and 5G technology has injected unprecedented vitality into the regional economic innovation system. The rapid development of these technologies not only promotes the optimization and upgrading of industrial structure, but also brings new growth momentum to regional economic development. Especially with the widespread application of AI technology, it is gradually changing our production and lifestyle, becoming an important engine for promoting economic and social development. However, with the deepening development of AI technology, we must also face the potential social problems it may bring, especially the employment problems caused by AI replacing traditional professions. This requires us to actively explore and solve these challenges while enjoying the technological dividend, ensuring that technological development and social harmony progress together. China has achieved remarkable achievements in the field of AI, ranking among the top in terms of innovation achievements in the world. However, we should still be aware that there is still a certain gap between us and developed economies such as the United States in terms of innovation quality. The shortcomings and deficiencies of key core technologies may become bottlenecks that constrain the long-term healthy and stable development of China's science and technology industry. Therefore, in the future, we need to continue to strengthen our support for talent, funding, and institutions in the field of AI technology and industry. We need to fully leverage the advantages of China's large-scale market and new national system, accelerate the independent and controllable realization of key AI core technologies, and provide strong support for the security and stability of the industrial and supply chains. Only in this way can we stand invincible in global technological competition and inject new impetus into the sustainable development of regional economy.

References

[1] Li J, Bao Q. Research on the coordinated development of agglomeration economy and environmental performance based on artificial intelligence[J]. Physics and Chemistry of the Earth, Parts A/B/C, 2023, 130: 103371.

[2] Freire C A R, Ferreira F A F, Carayannis E G, et al. Artificial intelligence and smart cities: A DEMATEL approach to adaptation challenges and initiatives[J]. IEEE Transactions on Engineering Management, 2021, 70(5): 1881-1899.

[3] Liu Y, Zhu X, Wang Y. Revisiting and evaluation of the index of sustainable economic welfare based on artificial intelligence: data from 30 Chinese provinces from 2003 to 2019[J]. Environment, Development and Sustainability, 2022, 25(4):3123-3152.

[4] Montes G A, Goertzel B. Distributed, decentralized, and democratized artificial intelligence[J]. Technological Forecasting and Social Change, 2019, 141: 354-358.

[5] Dong F, Zhang S, Zhu J, et al. The impact of the integrated development of AI and energy industry on regional energy industry: A case of china[J]. International journal of environmental research and public health, 2021, 18(17): 8946.

[6] Wang H. Application of intelligent analysis based on project management in development decision-making of regional economic development[J]. Applied Artificial Intelligence, 2023, 37(1): 2204263.

[7] Lv K, Tang H, Bak-Jensen B, et al. Hierarchical learning optimisation method for the coordination dispatch of the inter-regional power grid considering the quality of service index[J]. IET Generation, Transmission & Distribution, 2020, 14(18): 3673-3684.

[8] Nikolaev A I, Krivovichev S V. Prospects for the Development of the Kola Chemical Technological Cluster in Transition from a Resource-Based Economy to an Innovative Economy[J]. Theoretical Foundations of Chemical Engineering, 2019, 53(5):933-938.

[9] Cassalho F, Beskow S, De Mello C R, et al. Artificial intelligence for identifying hydrologically homogeneous regions: A state-of-the-art regional flood frequency analysis[J]. Hydrological Processes, 2019, 33(7):1101-1116.

[10] Li Y, Janik P, Schwarz H. Aggregated wind power characteristic curves and artificial intelligence for the regional wind power infeed estimation[J]. Electrical Engineering, 2024, 106(1): 655-671.

[11] Li X. Suitability evaluation method of urban and rural spatial planning based on artificial intelligence [J]. Journal of Intelligent Systems, 2022, 31(1):245-259.
[12] Semieniuk G, Taylor L, Rezai A, et al. Plausible energy demand patterns in a growing global economy with climate policy[J]. Nature Climate Change, 2021, 11(4): 313-318.
[13] Dadteev K, Shchukin B, Nemeshaev S. Using artificial intelligence technologies to predict cash flow [J]. Procedia Computer Science, 2020, 169:264-268.
[14] Jatmika R T D, Ratnasari V, Nadlifatin R. Empowering Micro-Entrepreneurs through Artificial Intelligence: A Conceptual Framework for AI-Based Marketing [J]. Procedia Computer Science, 2024, 234:1087-1094.
[15] Li H, Liu D. Innovative development of intangible culture of arts and crafts in artificial intelligence decision support system[J]. Mobile Information Systems, 2022, 2022(1): 1123356.
[16] Gao Y, Ai Q, Wang X, et al. Distributed cooperative economic optimization strategy of a regional energy network based on energy cell–tissue architecture[J]. IEEE transactions on industrial informatics, 2019, 15(9): 5182-5193.