ISSN 2616-5902 Vol. 6, Issue 11: 170-175, DOI: 10.25236/AJBM.2024.061125

The Theoretical Basis of Digital Economy Promoting the Formation of New Quality Productivity

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Abstract: *With the rapid development of the digital economy, the global economic structure and industrial system have undergone profound changes. The widespread application of digital technology not only greatly improves production efficiency, but also gives birth to new forms of productivity and promotes the formation of new quality productivity. This paper explores how the digital economy promotes the formation of new quality productivity from four aspects: technological innovation, industrial integration, institutional innovation, and social innovation, and deeply analyzes the theoretical basis for the interaction of these factors. Research has found that technological innovation has become the core driving force for the development of the digital economy by improving production efficiency and fostering new industries; Industrial integration breaks through traditional industry boundaries, promotes resource reallocation and value chain reconstruction; Institutional innovation provides development guarantees for the digital economy, promotes social equity, and facilitates the effective application of innovative achievements; Social innovation, on the other hand, enhances the overall productivity of society by changing production and lifestyle. In summary, the digital economy has not only broken through the limitations of traditional productivity models in promoting the formation of new quality productivity, but also provided more efficient, intelligent, and sustainable impetus for global economic development.*

Keywords: *digital economy, new quality productivity, technological innovation, industrial integration*

1. Introduction

With the rapid development of information technology, especially the application of the Internet, artificial intelligence, big data, cloud computing and other cutting-edge technologies, the digital economy has become a new engine to promote global economic growth. The digital economy has not only changed traditional modes of production, consumption, and circulation, but also brought profound social changes and industrial upgrading. According to the definition of the International Monetary Fund (IMF), the digital economy is an economic activity based on the application of digital technology, which includes various forms such as e-commerce, digital payments, virtual products and services, covering the digital transformation of traditional industries and the rise of emerging digital industries [1]. On a global scale, the digital economy has become a core driving force for promoting economic growth, optimizing industrial structure, improving production efficiency, and creating emerging value.

New quality productivity is not only about the recombination and utilization of production factors, but also emphasizes the core position of knowledge, information, technology, and innovation in the production process. The traditional theory of productivity mainly focuses on the efficiency of material production and labor force, while the emergence of the digital economy has brought profound changes to the connotation of productivity. The digital economy, through the high-speed transmission of information flow, widespread application of technology, and cross-border integration of platforms, not only promotes the upgrading and replacement of traditional industries, but also gives birth to emerging industries and new business models characterized by innovation, intelligence, and service. Therefore, exploring how the digital economy can promote the formation of new quality productivity has important theoretical value and practical significance.

2. Definition and development history of digital economy

The digital economy refers to all forms of economic models that are based on digital technology and widely applied in economic activities. It involves the development, application and innovation of

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digital technology, mainly including the penetration and transformation of information technology, the Internet, big data, artificial intelligence, cloud computing and other scientific and technological means in all aspects of economic life [2]. In a broad sense, the digital economy not only includes the digital transformation of traditional economic fields, but also the emergence of emerging industries and business models driven by digital technology, such as e-commerce, digital payments, sharing economy, etc.

The concept of digital economy first appeared in 1995, proposed by American scholar Donald Davidson, and mainly focused on the impact of network technology and information flow on traditional economic models. With the rapid development of information technology, especially the popularity of the Internet, the definition of digital economy has gradually expanded to cover more digital technology applications, such as big data analysis, cloud computing, the Internet of Things, etc.

After entering the 21st century, especially with the popularity of smartphones and the development of 5G networks, the digital economy has entered a stage of rapid development. The penetration depth and breadth of digital technology into various industries are constantly expanding, from e-commerce and online payments to intelligent manufacturing, intelligent logistics, digital finance, artificial intelligence and other fields. The digital economy has become an important engine for global economic growth. According to a report by the World Economic Forum (WEF), the total size of the global digital economy accounted for about 15% of global GDP in 2020, and this proportion is still growing.

In China, the development of digital economy began with the introduction of Internet technology, and rapidly extended to many fields such as financial technology, e-commerce, cloud computing, big data, etc. The Chinese government attaches great importance to the development of the digital economy and has issued multiple policy documents in recent years to promote the digital economy as a new driving force for economic development. According to the "China Digital Economy Development and Employment Report (2023)", China's digital economy has become the world's second largest digital economy, accounting for nearly 40% of GDP. It is expected that the digital economy will continue to maintain a high growth momentum in the coming years.

3. Analysis of the characteristics of new quality productivity

The traditional definition of productivity usually revolves around three core elements: labor, means of production, and production technology, emphasizing the effective combination and utilization efficiency of these elements in the material production process. Traditional productivity emphasizes the quantity of labor, accumulation of capital, and advancement of technological equipment, which have formed the foundation of economic growth over a relatively long period of historical development. However, with the continuous development of the social economy and technological progress, the composition of traditional productive forces has gradually shown certain limitations. New quality productivity is a new form of productivity formed under the promotion of new technological changes such as informatization, intelligence, and digitization [3]. It not only focuses on the improvement of traditional production factors, but also integrates modern technological achievements such as innovation capability, knowledge capital, digital technology, and artificial intelligence, emphasizing the qualitative change of productivity rather than just the increase in quantity. New quality productivity represents a higher level, more comprehensive, and more intelligent form of productivity, and it is a key force in promoting the transformation of social production modes from labor-intensive to technology intensive.

New quality productivity has several significant characteristics. Firstly, it relies more on the accumulation, dissemination, and innovation of knowledge and information. Compared with traditional productivity, innovative enterprises and countries increasingly rely on intellectual property, scientific research achievements, and technological inventions to promote productivity improvement. Therefore, the creation, transformation, and utilization of knowledge have become the core driving force for improving productivity. Secondly, the development of new quality productivity highly relies on advanced technologies, especially digital technologies such as artificial intelligence, the Internet of Things, blockchain, and big data. These technologies empower various industries, improve production efficiency, optimize resource allocation, and promote the intelligence and digital transformation of industries. In addition, the new quality productivity has shown outstanding performance in promoting the intelligence and efficiency of the production process. The widespread application of information technology enables various industries to achieve data-driven decision-making, and technological means such as automation, real-time monitoring, and precise analysis have gradually improved the overall

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efficiency of productivity. New quality productivity also focuses on green sustainability, emphasizing environmental protection and resource conservation. Through the application of digital and intelligent technologies, it improves the efficiency of the production process, reduces resource waste, lowers environmental impact, and promotes the development of a green economy. Finally, new quality productivity has global characteristics, and the digital economy promotes global information flow, technology sharing, and market connectivity. Multinational enterprises achieve global resource allocation and productivity improvement through digital platforms, efficient logistics, and optimization of global supply chains.

4. Theoretical basis for promoting the formation of new quality productivity through the digital economy

4.1 The role of digital technology in enhancing productivity

Digital technology has become the core driving force for improving productivity, especially with the widespread application of technologies such as big data, cloud computing, artificial intelligence, and the Internet of Things, production and management processes have become more efficient, precise, and intelligent. These technologies not only optimize the production methods of traditional industries, but also give rise to the rise of emerging industries. For example, the manufacturing industry has achieved "Industry 4.0" through intelligent production lines and equipment, reducing production costs, improving production efficiency and product quality. At the same time, digital technology makes resource allocation more efficient. Enterprises can control market demand changes in real time, flexibly adjust production plans, reduce waste, and optimize resource utilization through data analysis and accurate prediction. Specifically, artificial intelligence and machine learning technologies have improved the automation level of various industries, reduced reliance on manual labor, and enhanced production efficiency; Big data technology helps enterprises identify market trends, user needs, and potential risks through the analysis of massive data, in order to make more accurate decisions, improve decision-making efficiency, and enhance market responsiveness; Cloud computing enables enterprises to access computing resources on demand, reducing infrastructure investment costs and improving flexibility and scalability. Through the application of these technologies, productivity has achieved a qualitative leap, not only promoting the upgrading of traditional industries, but also laying a solid foundation for the formation of a digital and intelligent economic system.

4.2 The promotion of knowledge productivity by the digital economy

The knowledge economy is an important component of the digital economy, and the popularization of digital technology has greatly promoted the improvement of knowledge productivity. In the traditional industrial economy era, productivity mainly relied on the accumulation and processing of material resources, while in the digital economy era, knowledge, information, and innovation have become key factors driving productivity improvement. The progress of digital technology has made the dissemination, storage, sharing and re creation of knowledge more rapid and convenient, breaking the time and space constraints, which is specifically reflected in the rapid flow of information. Through the Internet, social media, online learning platforms and other digital platforms, information and knowledge can be instantly transferred around the world, and individuals, enterprises and governments can more easily access the world's leading technologies and theories, thus promoting innovation; Accelerating knowledge innovation, researchers can conduct scientific experiments and data analysis more efficiently through tools such as big data analysis, machine learning, and artificial intelligence, shorten research and development cycles, and promote technological progress; As well as the open innovation model, the digital economy encourages enterprises and institutions to promote open sharing and collaborative innovation of knowledge through open source platforms, collaborative networks, and other means, reducing research and development costs and stimulating innovative thinking. The vigorous development of the digital economy not only promotes the formation of an innovation driven economy, but also makes knowledge the core of productivity and an important support for new quality productivity.

4.3 The promotion of productivity by network platform economy

Network platform economy is an important part of the digital economy. Its core is to realize the efficient allocation and flow of resources through Internet technology and platform mechanism.

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Through a platform based business model, enterprises can quickly connect supply and demand sides, reduce intermediate links, and improve production efficiency. Specifically, the platform economy effectively promotes resource sharing and efficient allocation. For example, Didi Chuxing fully utilizes idle vehicles through the shared travel platform, improving the utilization rate of transportation resources, while Airbnb enables hosts to realize the value of their own properties through the shared accommodation platform; In addition, online platforms have reduced transaction costs through digital means, eliminated information asymmetry and geographical restrictions, and promoted closer connections between producers and consumers, resulting in improved transaction efficiency; The platform economy has also given birth to a large number of emerging industries and professions, such as e-commerce platforms driving the development of online retail, digital content platforms giving birth to the network culture industry, and online education platforms driving educational innovation. In short, the online platform economy has significantly improved the overall productivity level and brought about a large number of emerging industries and employment opportunities by promoting the efficient flow and allocation of production factors.

4.4 Labor structure and productivity development in the digital economy

The development of the digital economy has had a profound impact on the labor market and productivity structure, driving the transition from traditional heavy physical labor and low skilled labor to high skilled and innovative labor. This transformation has promoted structural changes in the labor market and propelled the development of productivity. Specifically, with the advancement of automation and artificial intelligence technology, many low skilled positions are gradually being replaced by machines, while the demand for high skilled positions continues to rise. Professions such as software engineers, data scientists, and artificial intelligence experts have become popular in the digital economy era; Secondly, the rise of digital platforms has provided flexible employment opportunities for freelancers and individual workers. Workers can choose job content based on their personal skills and interests, promoting the diversification of work forms; Finally, the popularization of technology and the application of intelligent tools have greatly improved labor productivity. Employees can improve work efficiency through digital tools, and enterprises can optimize their production processes through technology, achieving higher levels of productivity. With the continuous development of the digital economy, the transformation of the labor market has brought new challenges and opportunities. How to cultivate talents that adapt to the new economic model, and how to ensure social equity while promoting technological progress, have become key issues that urgently need to be addressed globally.

The rapid development of the digital economy provides a solid theoretical foundation for the formation of new quality productive forces. From the improvement of production efficiency through digital technology, to the promotion of knowledge productivity, and to the efficient resource allocation of the network platform economy, the digital economy has promoted the development of productivity through innovation and transformation at multiple levels. Under the transformation of labor structure, the digital economy not only promotes the optimization of economic structure, but also creates new employment opportunities and development space for society. However, this process is also accompanied by challenges. How to balance technological progress and social equity, and how to respond to structural changes in the labor market, will be key issues for the future development of the digital economy.

5. The path of digital economy promoting the formation of new quality productivity

5.1 Technological innovation path

Technological innovation is the core driving force behind the formation of new quality productivity in the digital economy. With the rapid development of technologies such as information technology, artificial intelligence, big data, cloud computing, and the Internet of Things, traditional production models are undergoing unprecedented changes. The widespread application of digital technology not only improves production efficiency, but also promotes the birth of new business models and industrial forms [4]. For example, artificial intelligence and machine learning technologies can efficiently analyze and process massive amounts of data, support intelligent decision-making and accurate prediction, thereby improving the efficiency of product development and production processes; The application of blockchain technology in supply chain management provides a more secure and transparent solution for cross-border transactions. Technological innovation has enabled productivity to no longer rely

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solely on traditional resource inputs, but to optimize production processes and efficiently utilize resources through intelligent and automated means.

5.2 Industrial integration path

Industrial integration is another important path for the digital economy to promote the formation of new quality productivity. The digital economy not only breaks the boundaries of traditional industries, but also accelerates cross industry integration and innovation, giving birth to many emerging industries and business models [4]. For example, the combination of the Internet and the financial industry gave birth to FinTech; The integration of manufacturing and information technology has promoted the arrival of intelligent manufacturing and Industry 4.0; The integration of cultural industries and digital technology has given rise to emerging forms of entertainment such as online entertainment, virtual reality (VR), and augmented reality (AR). Through industrial integration, the digital economy has created more value chains and industrial ecosystems, making the flow of resources more efficient and the combination of production factors more flexible, providing broad space for the formation of new quality productivity.

5.3 Institutional innovation path

The path of institutional innovation not only promotes the development of the digital economy, but also provides guarantees for the formation of new quality productive forces. The rapid development of the digital economy requires a flexible and efficient institutional environment, and institutional innovation provides necessary conditions for the construction of such an environment. For example, in the digital economy, traditional labor market systems and organizational forms of enterprises are no longer fully adapted to new demands, and new labor market models such as flexible employment and sharing economy have emerged. The government has promoted the market-oriented application of innovative achievements through measures such as optimizing tax policies, increasing support for innovative enterprises, and improving intellectual property protection. In addition, the institutional construction of emerging issues such as data governance and privacy protection has become an important component of the development of the digital economy, ensuring the healthy development of the digital economy and social equity.

5.4 Social innovation path

The path of social innovation promotes the further formation of new quality productivity by responding to social needs, transforming consumption patterns and lifestyles [5]. The digital economy has not only changed the way of production, but also reshaped people's social structure and way of life. In the digital age, new forms of society such as social platforms, sharing economy, online education, and remote work are flourishing, promoting innovation in resource sharing and social interaction. Consumers are no longer just recipients of products, they have become producers of information and co creators of services on digital platforms, driving the restructuring of the value chain. In addition, the application of digital technology in fields such as healthcare, education, and environmental protection not only improves the quality and efficiency of public services, but also drives the improvement of overall social welfare, further promoting the enhancement of social productivity.

Overall, the four paths of technological innovation, industrial integration, institutional innovation, and social innovation interact with each other to promote the formation of new quality productivity. These paths not only change the way productivity develops, but also provide new impetus for sustainable economic growth, social equity, and efficiency. The future of the digital economy will continue to rely on the continuous deepening and integration of these four paths, driving the global economy into a new era of intelligence and efficiency.

6. Conclusion

Against the backdrop of the global digital wave, the digital economy, as an important force driving productivity development, is profoundly reshaping the economic system, industrial structure, and social operation mode. This article explores the relationship between the digital economy and the formation of new quality productivity, analyzes the theoretical basis for the digital economy to promote the formation of new quality productivity, and summarizes several core viewpoints.

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Firstly, the core driving force of the digital economy comes from technological innovation. The rapid development of information technology, artificial intelligence, big data, blockchain and other technologies has not only improved production efficiency, but also spawned new industrial forms and business models. Through the empowerment of technology, the allocation of production factors has become more efficient and intelligent, and profound changes have occurred in production methods and management models, thereby promoting the development of productivity towards higher levels and higher efficiency. Secondly, industrial integration has become an important way to promote the formation of new quality productivity. The digital economy breaks down the boundaries between traditional industries and promotes deep integration and collaborative innovation across industries. This integration not only accelerates the growth of emerging industries, but also promotes the transformation and upgrading of existing industries. The mutual infiltration and resource sharing between industries have promoted the recombination and allocation of production factors, created more value chains, and provided broad space for the formation of new quality productivity. Once again, institutional innovation provides a fundamental guarantee for the healthy development of the digital economy. With the booming development of the digital economy, traditional institutional systems are facing unprecedented challenges. The flexible labor market, innovation driven policy support, protection of intellectual property rights, and improvement of digital governance provide strong support for the formation of new productive forces. Institutional innovation not only plays a driving role in the development of the digital economy, but also plays an important role in promoting social equity, ensuring the application of innovative achievements, and optimizing resource allocation. Finally, social innovation is an important factor in promoting the formation of digital economy and new quality productivity. The digital economy has not only changed the way of production, but also profoundly reshaped the social structure and way of life. The transformation of roles from consumers to producers, the widespread application of online platforms, and the digital innovation of social services have injected new vitality into social innovation. Social innovation promotes the sharing of resources, changes in social interaction patterns, and optimization of public services, driving the overall productivity of society.

In summary, the digital economy has promoted the formation of new quality productivity through the interaction of technological innovation, industrial integration, institutional innovation, and social innovation. Its theoretical basis is not only derived from breakthroughs in traditional productivity models, but also closely related to the pursuit of efficient, intelligent, and sustainable development models in modern society. In the future development process, the digital economy will continue to innovate and optimize through these four paths, injecting new vitality into the global economy and promoting a new stage of global productivity that is more intelligent, networked, and green.

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