Research on The Development Trend and Influencing Factors of Digital Transformation on Global Digital Productivity

Ren Yuheng and Wu Hong

Abstract

Digital economy is an important trend in the development of the world economy today. It is based on digital technology and promotes economic growth and development by means of digitization and information. Digital transformation is the key factor to promote the rapid development of digital economy, which means that enterprises or organizations transform traditional business into digital business and use digital technology to enhance their competitiveness. In the context of digital economy, digital transformation has become the only way for enterprises to develop. Only through digital transformation can enterprises better adapt to market demand, improve production efficiency, reduce costs and enhance competitiveness. Digital productivity is the application of digital technology to transform data into productivity, so as to promote economic development and social progress. The improvement of digital productivity will lead to more efficient, accurate and intelligent production methods and business models, thus promoting industrial upgrading and social transformation. There is a close relationship between digital transformation and digital productivity, with digital transformation being an important means to improve digital productivity, while digital productivity is an important manifestation of digital transformation.

Among the digital economy, digital transformation and digital productivity, digital productivity is an important driving force for the development of digital economy and the promotion of digital transformation. Its difference from traditional productivity lies in its integration with digital technology, which is an important means to realize the development of digital economy, including big data, cloud computing, artificial intelligence, Internet of things and other emerging technologies. These technologies can transform all kinds of information in the real world into digital information, which is convenient for data processing and utilization. The integration of digital technology and traditional productivity not only improves the quality and accuracy of data, but also reduces the cost and improves the efficiency, and drives the change of production factors and production relations, bringing new business models.

Therefore, the four elements of digital economy, digital transformation, digital productivity and digital technology are mutually reinforcing and supporting each other, and jointly driving the development and progress of today's world economy.

This paper systematically reviews the development trend and influencing factors of digital transformation on global digital productivity. However, the current theoretical research on global digital productivity is still superficial, and further research and discussion are expected.

1.1 Research Background

The theoretical research on global digital productivity aims to explore the impact of digital technology on global economic productivity. With the rapid development of digital technology, various industries around the world are facing the challenges and opportunities of digital transformation. The wide application of digital technology has greatly changed the pattern of global productivity, promoted the improvement of production efficiency and rapid economic growth.

At present, all countries in the world are implementing the relevant policies of digital economy, hoping to improve economic efficiency and competitiveness through digital transformation. Many countries, including the United States, Germany, Japan and China, have formulated digital economy development strategies and increased investment in the

research, development and application of digital technologies. The rapid development of digital economy on a global scale has had a positive impact on promoting global economic growth and improving productivity.

Scholars around the world are focusing on the impact of digital technology and digital productivity on economic development, but after analyzing the corresponding literature, it is found that there are still some problems and deficiencies in the existing research results. The first problem is that the specific impact mechanism of digital technology on productivity is not clear enough. Although many studies have paid attention to this aspect, there is still a lack of in-depth discussion and research on this impact mechanism. The second issue is that digital transformation will affect different industries and regions to different degrees, so more specific and precise research is needed for different situations. The third problem is that existing research mainly focuses on empirical analysis and case studies, and lacks systematic theoretical research, which requires further theoretical construction and empirical research.

Therefore, this paper hopes to review the theoretical research on global digital productivity, synthesize various relevant research results, clarify the current status and progress of current research, and provide theoretical reference and research path for further in-depth research. Through systematic literature review, a comprehensive understanding of the relevant theories of digital economy can be formed, providing ideas and inspiration for scholars at home and abroad. At the same time, it can also provide references for government and enterprise decision-making and promote the sustainable development of the digital economy.

1.2 Research significance

The value of global digital productivity research is far-reaching, covering both theoretical research and empirical research.

From a theoretical perspective, this study not only enriches the theoretical system in the field of digital economy, but also deepens our understanding of the internal logic and essential characteristics of digital economy. With the vigorous development of the global digital wave, the digital economy has gradually become a new engine of world economic growth. Through the theoretical discussion of global digital productivity, it can provide solid theoretical support for digital economy and guide practice. In addition, the study of global digital productivity can also help optimize the research methods in the field of digital economy. The development and practice of digital economy need the support of scientific research methods, and the research of global digital productivity can summarize the advantages and disadvantages of different theoretical models and analysis methods, propose more scientific and accurate research methods, and provide an important reference for the research in the field of digital economy. By comparing the advantages and disadvantages of various theoretical models and analysis methods, this study will help to propose more accurate and scientific research methods, and provide valuable research references for the field of digital economy.

At present, the digital strategies chosen by various countries in the world have their own characteristics. Focusing on the global scope, in-depth exploration of digital productivity not only has theoretical value, but also provides clear guidance for practical activities.

Research on global digital productivity can provide directional guidance for governments and enterprises, help them grasp the strategic opportunity and direction of digital transformation, provide guidance for government departments at the policy formulation level, and encourage them to form policies and measures in line with the development of digital economy. At the same time, for enterprises, research on global digital productivity can help optimize decision-making and strategic planning, thereby improving the efficiency of production organizations and achieving sustained and steady economic growth.

To sum up, the study of global digital productivity is of great significance in both theory and practical application. Through in-depth analysis, it can not only provide theoretical support and research methods for academic research in

the field of digital economy, but also provide powerful guidance for the practical activities of governments and enterprises, and jointly promote the vigorous development of digital economy.

2. Research on the development of digital economy and its impact

2.1 Research on the development of global digital economy

2.1.1 Contribution of digital economy to global productivity improvement

The digital economy has had an important impact on productivity across the globe. An analysis of several studies shows that the digital economy can contribute to global productivity by promoting innovation and increasing labor productivity.

According to Trischler and Li-Ying's research[2], the degree of development of the digital economy is related to the increase in the level of digitalization. An increase in the level of digitalization means that enterprises and individuals are better able to utilize digital technologies for innovation and production activities, thus driving productivity improvement. They also point out that the contribution of digitalization to economic growth is not equal, and the level of digital development in each country or region needs to be considered simultaneously.

In his research, Wang Yang explored the development overview[3] of the global digital economy. He pointed out that on a global scale, the development of the digital economy shows different characteristics and trends. On the one hand, some developed countries have formed the core capabilities and competitive advantages of the digital economy and become the main drivers of the global digital economy, he said. On the other hand, some developing countries are speeding up the pace of digital transformation, hoping to boost productivity and economic growth through the development of digital economy.

??? explores the impact[10] of the digital economy on productivity in his research. He noted that the digital economy has driven productivity growth by providing more efficient and flexible production methods and innovative business models. Through the application of digital technologies, enterprises can better collaborate, improve production efficiency, and achieve a higher level of automation and intelligent production, he said. In addition, the digital economy has promoted the development of new industries and job opportunities, making a positive contribution to economic growth and social welfare.

Zhu Quan and Zhang Qian's research explores the role[13] of the digital economy in broader relations of production. They argue that the digital economy improves the agility and fineness of resource allocation by changing existing production relations and business models. The application of digital technology makes the allocation of production factors more flexible, optimizes supply chain management, and promotes the matching of demand and supply. These changes have further boosted productivity.

Taking these findings together, we conclude that the digital economy has made a significant contribution to global productivity. The development and application of digital technologies have promoted innovation and improved production efficiency, and digital productivity has brought new impetus to economic growth and social development in general.

2.1.2 Application and impact of digital technologies in global value chains

The application and impact of digital technology in the global value chain is one of the important aspects of the development trend of the global digital economy. Research on this topic shows that digital technologies play an important role in global value chains and have a profound impact on the global economy.

Researchers MFG Trischler and J Li-Ying found in their research that there is a correlation[2] between

multidimensional digital readiness and digital transformation outcomes. They argue that the widespread application and adoption of digital technologies in global value chains can improve the digital readiness of businesses, which in turn drives the effectiveness of digital transformation. Their research shows that businesses across the globe have achieved successful digital transformation outcomes by adopting digital technologies to improve business processes, increase productivity and innovate.

In addition, the role of digital economy on broad production relations has also received the attention of researchers. Zhu Quan and Zhang Qian's research pointed out that the digital economy has a positive impact[13] on broad production relations by creating new production modes and business models. The wide application and adoption of digital technology has changed traditional production modes, improved production efficiency and shortened production chains, while also promoting innovation and cooperation among enterprises. The application of digital technology in the global value chain has made cooperation and communication between enterprises more convenient, and further promoted the development of the global economy.

It should also be mentioned that the application of digital technology in the global value chain has also played a positive role in regional economic development. Zhao Hongjun's research shows that the digital economy, as a new driving force for regional economic development, has created more job opportunities and economic growth potential[16] for regional economies. The wide application of digital technology has promoted the innovation and development of enterprises and improved the competitiveness of enterprises, thus further promoting the development of regional economy.

In summary, the application and impact of digital technology in the global value chain is an important aspect of the development of global digital economy. Through the widespread use and adoption of digital technologies, businesses improve their digital readiness and drive the effectiveness of digital transformation. The application of digital technology has also promoted the innovation and development of enterprises, which has played a positive role in the broad production relations and regional economic development.

2.2 Research on development of regional digital economy

2.2.1 Research on development of China's digital economy

The development of digital economy has played a positive role in promoting the transformation of China's economy. According to the research[2] of Trischler et al., the continuous development of digital economy has promoted the optimization and upgrading of China's economic structure, and promoted the transformation of traditional industries to digital intelligence network. Among them, digital transformation accelerates the application and innovation of information technology in various fields, improves production efficiency and quality, and enhances the competitiveness of enterprises.

The development of the digital economy has provided new growth drivers for the Chinese economy. According to Wang Yang's research[3], the rapid development of the digital economy has allowed emerging industries to flourish, which has become a new engine driving China's economic growth. The new business forms, models and products created by the digital economy have promoted the optimization and upgrading of the economic structure and injected new vitality into economic growth. At the same time, the digital economy has also created a large number of job opportunities, promoted the increase of employment and the optimization of employment structure.

The rapid development of the digital economy has played an important role in enhancing the international competitiveness of the Chinese economy. According to Zhao Hongjun's research[16], the rise of the digital economy has put Chinese enterprises in a better position in global competition. The digital economy has promoted the international development of Chinese enterprises, improved their global supply chain management capabilities and innovation capabilities, and enhanced their competitiveness in the global market. The development of the digital economy has also promoted international cooperation and exchanges in the digital economy and strengthened

economic ties between China and other countries.

At the same time, the development of digital economy has brought a series of impacts and challenges to the transformation of China's economy. The research[13] of Zhu Quan et al. pointed out that the role of digital economy on broad production relations is multifaceted, which not only promotes the improvement of productivity and the upgrading of industrial structure, but also brings some new risks and problems. The rapid development of the digital economy has brought challenges in data security, privacy protection, intellectual property protection, etc., which requires the government and enterprises to strengthen supervision and legal regulations to ensure the healthy and orderly development of the digital economy.

In summary, previous research results show that the digital economy has played a positive role in helping China's economic transformation. The development of the digital economy has provided China with new growth drivers and promoted industrial upgrading and innovation. The rapid development of the digital economy has also boosted China's international competitiveness and strengthened economic ties between China and other countries. However, the development of the digital economy has also brought some new challenges and problems, which require the joint efforts of the government and enterprises to deal with and solve.

2.2.2 Research on the development of digital economy in Africa

As a continent with a concentration of developing countries, the development of Africa's digital economy is mainly reflected in the aspect of digital transformation, and there are some unique characteristics and trends in the aspect of digital transformation of African industries. This section will be combined with relevant papers for an overview.

According to Park Young-hee's research in her paper "Characteristics, Problems and Strategic Options of Industrial Digital Transformation in Africa"[48], digital transformation in the African region faces some special challenges and opportunities. First of all, Africa's digital economy development foundation is relatively weak, and the penetration rate of digital technology is low, which brings certain difficulties to the digital transformation in Africa. Second, Africa is a vast continent with a domestic digital innovation ecosystem that has yet to be fully developed, and its innovation capacity and achievements are still limited. Third, there is a wide digital divide and digital inequality across the continent, with some remote and rural areas having relatively low levels of digitalization. In addition, there is a degree of vulnerability in consumer markets and supply chain systems on the continent.

The trend of digital transformation in African industries is mainly focused on three aspects. The first is the development of digital finance. According to the research of Li Bizheng and Wu Pengmei in their paper "The Impact and Reshaping of Digital Economy on Social Production and Reproduction Process"[36], financial services in Africa are relatively underdeveloped, and digital financial innovations such as Internet finance and mobile payment have become an important direction of digital transformation in Africa. The second is the promotion of digital agriculture. According to Xia Jiechang et al. 's research in the paper "The Impact of Digital Economy on China's Regional Innovation Output"[44], agriculture in Africa is an important pillar of its economy, and digital transformation can enhance agricultural production efficiency in Africa, improve farmers' lives, and solve food security problems to a certain extent. Finally, the application and promotion of digital technology. According to Park's research, African governments and enterprises should step up their efforts in the application and promotion of digital technologies, especially innovation in areas such as e-commerce, artificial intelligence and the Internet of Things, in order to promote the development of Africa's digital economy.

All in all, while facing special challenges, Africa's industrial digital transformation also has broad prospects for development. By strengthening digital financial services, advancing the development of digital agriculture and promoting the application of digital technologies, Africa is expected to achieve rapid and leapfrog development of the digital economy.

2.3 Study on the impact of the development of digital economy on labor market

2.3.1 Digital technology promotes the optimal allocation of labor resources

The rapid development and wide application of digital technologies are exerting a profound impact on the labor market. This section will focus on how digital technologies can facilitate the optimal allocation of labor resources. There have been several related papers on this issue.

According to Trischler et al. (2022)[2], there is an association between multidimensional digital readiness and digital transformation outcomes. Digital readiness refers to the ability of individuals, organizations, and societies to use digital technologies. By increasing digital readiness, the workforce can better respond to the opportunities and challenges posed by digital transformation. An increase in digital readiness can help optimize the allocation of labor resources and make them more adaptable to the development of the digital economy.

Wang Yang (2020) 's article "Overview of Global Development of Digital Economy"[3] points out that the development of digital economy will profoundly change the demand and supply of labor market. The traditional labor market will gradually evolve in the direction of digitalization, and the labor force equipped with relevant digital technologies and skills will be needed to adapt to the future job demand. The wide application of digital technology will lead to the optimal allocation of labor resources, thereby improving production efficiency and promoting rapid economic development.

Zhao Hongjun (2022) pointed out in his article "Digital Economy: A New driving force for Empowering Regional Economic Development"[16] that digital economy is becoming a new driving force for promoting regional economic development. The application of digital technology can not only improve the efficiency and flexibility of labor resources, but also help to realize the allocation and optimization of labor market. Through digital technology, the workforce is no longer limited by geographical location, and can collaborate remotely and work across regions. The optimal allocation of labor resources brought about by this digital technology will promote the development of regional economies.

Zhu Quan Quan and Zhang Qian (2021) pointed out in their study[13] on the Role of Digital Economy on Broad Production Relations that the development of digital economy has changed the production relations of labor market. The application of digital technology promotes closer and more efficient cooperation among labor forces, and improves productivity and the allocation efficiency of labor resources. Digital technologies have provided more opportunities and choices for the workforce, enabling the workforce to be better matched to jobs that suit their abilities and interests.

To sum up the previous argumentation process, digital technology plays an important role in promoting the optimal allocation of labor resources. By increasing digital readiness, changing labor market demand and supply, boosting regional economic development, and changing labor production relations, digital technology makes labor more efficient, flexible, and diversified, thereby increasing productivity and promoting economic development.

2.3.2 The profound impact of the digital economy on the labor market

The rapid development of the digital economy has had a profound impact on the labor job market. With the popularization and application of digital technology, the way of working in many traditional industries has undergone great changes, with some traditional labor market demands decreasing while the demand for digital technology-related positions has increased dramatically. This transformation has brought about a profound adjustment in the structure of the labor market, which has brought significant impacts on both individuals and the society as a whole, as shown in:

?1?The development of the digital economy has promoted the transformation of the job structure in the labor market

The widespread use of digital technologies has spawned many new careers, such as data analysts, AI engineers, and algorithm specialists. These occupations require a high level of understanding and operational ability of digital technologies, and require relevant technical expertise and knowledge background. Therefore, the rise of the digital

economy has brought about great changes in the demand of the labor market, which has promoted the upgrading and optimization of the occupational structure.
?2?The impact of the digital economy on the labor market is also manifested in changes in the demand and supply of labor.

The popularization and application of digital technology has led to an increase in the demand for digital skilled personnel in the labor market. At the same time, the development of digital technology has also improved the productivity and creativity of the labor force, and changed the supply structure of the labor market.

On the one hand, the application of digital technology has reduced the demand for traditional labor force, causing shocks and challenges to certain positions in the labor market. On the other hand, the development of digital technologies has enhanced the productivity of the labor force and stimulated innovation and entrepreneurial activities in the labor market.

?3?The digital economy has also had an impact on the way Labour markets are organised and Labour relations
The application of digital technologies has enabled working modes such as telecommuting and flexible employment. This transformation has made the relationship between employees and employers more flexible and diverse, while also improving the efficiency and mobility of the labor market. The digital economy has also given rise to emerging business models such as the sharing economy and platform economy, providing more opportunities for labor market flexibility and entrepreneurial innovation.

Taking the above factors into consideration, the digital economy has had a profound impact on the labor job market. The rise of the digital economy has driven the transformation of the job structure in the labor market, increased the demand for digital skilled personnel, and changed the way labor supply and labor relations are conducted. Workers and society as a whole need to adapt to this change and upgrade their digital technology capabilities and awareness of innovation and entrepreneurship to meet the employment challenges in the era of digital economy.

3 Research on the development and impact of digital transformation

3.1 Development and trend of digital transformation

3.1.1 The digital transformation of China's manufacturing industry and its improvement in global status

The digital transformation of China's manufacturing industry is closely related to its global status. Driven by the digital transformation, China's manufacturing industry has ushered in new development opportunities and achieved great development results. He Wenbin (2020)[1] discussed the effect of digitalization in promoting the high-end of China's manufacturing value chain, pointing out that digital transformation makes China's manufacturing industry move to the high-end of the value chain, and improves the added value of industries and products. Liu Junqing (2022)[8] believes that digital transformation has injected more productivity into China's manufacturing industry, promoted the improvement of labor resource allocation efficiency, and pointed out that such improvement will further accelerate the global status of China's manufacturing industry.

The digital transformation has a huge impact on the global status of China's manufacturing industry. Liu Fei (2020) conducted research on how digital transformation can improve manufacturing productivity. He proposed that digital transformation has a threefold impact mechanism on the improvement of manufacturing productivity, including the optimization of production links, the innovation of business models and the restructuring[11] of organizational structure. These changes promote China's manufacturing industry to produce and supply products more efficiently, and further improve its competitiveness in the global market. Scholars such as Zhang Chunfei (2019)[12] have emphasized the role of digital transformation in promoting the construction of digital China, which has elevated China's manufacturing industry to the forefront of the digital era and enhanced China's position in the global digital era.

Digital transformation has an important impact on the position of China's manufacturing industry in the global value chain. The research of He Wenbin (2021) shows that digital transformation has a positive impact[43] on the position of China's manufacturing industry in the global value chain, and further enhances the global competitiveness and added value of China's manufacturing industry. The digital transformation also promotes close cooperation and interaction between China's manufacturing industry and global value chain participants, transforming China's manufacturing industry from a simple labor-intensive industry to one with high added value and technology content, and elevates China's manufacturing industry's position in the global supply chain.

To sum up the foregoing, the digital transformation of China's manufacturing industry has had a positive impact on its global position. Digital transformation has enhanced the competitiveness and productivity of China's manufacturing industry, moved it further up the global value chain, and enhanced its position in the global supply chain.

3.1.2 Inevitable trend and impact of digital transformation

The inevitable trend and impact of digital transformation has always been a hot topic for scholars. This section will review the research results of relevant papers in order to achieve a comprehensive understanding of the trend and impact of digital transformation.

He Wenbin (2020) analyzes[1] the effect of digitalization in promoting the high-end of China's manufacturing value chain, and finds that digital transformation provides strong support for the high-end development of China's manufacturing industry. Cong Yi and Yu Boyang (2020) investigated the impact[4] of digital economy on the efficiency of labor resource allocation in China, and the results showed that digital transformation plays an important role in the optimal allocation of labor resources. Liu Junqing (2022) focuses on ways[8] and means to gain productivity from digital transformation.

The digital economy plays an important role in digital transformation. Cui Baoguo and Liu Jinhe (2020)[9] discuss the definition and measurement of digital economy, as well as the relationship between digital economy and digital media. Si Xiao et al. (2017)[15] elaborated on the connotation, development and challenges of the digital economy and pointed out the importance of the digital economy in promoting economic development. Yan Deli and Gao Xiaoyu (2017) point out that digital economy is the commanding[26] height of a new round of global industrial competition.

Digital transformation has a significant impact on the improvement of manufacturing productivity. Liu Fei (2020) studied how digital transformation can improve manufacturing productivity and proposed a triple impact mechanism[11] of digital transformation. He Wenbin (2021)[43] discusses the correlation between digital transformation and the effect of global value chain climbing in China's manufacturing industry. Xiong Yuanjia (2022)[35] studied the development direction of digital transformation.

Digital transformation involves not only changes at the technical level, but also changes in organizational and management methods. Chen Chunhua et al. (2022)[22] discussed the difficulties and key points of digital transformation, emphasizing the importance of organizational culture and personnel training. Zhang Chunfei and Fan Xin (2019) call for greater efforts to develop the digital economy and accelerate the construction of digital China[12].

In general, digital transformation is an important trend in today's world. It can not only promote the high-end manufacturing industry and optimize the allocation of labor resources, but also promote the development of the digital economy and enhance productivity.

3.2 The impact of digital transformation on manufacturing productivity and efficiency

3.2.1 Mechanism of digital transformation to improve manufacturing productivity

Digital transformation has a significant impact on the productivity and efficiency of manufacturing. At present, the mechanism of digital transformation in improving manufacturing productivity mainly includes the following four aspects.

The first aspect is that the introduction of digital technology can improve production efficiency by improving the degree of automation and information technology in the production process. For example, the research of He Wenbin (2020)[1] shows that digitization promotes the development of China's manufacturing industry to the high-end, improves production efficiency and reduces production costs.

The second aspect is that digital transformation can improve the supply chain management of the manufacturing industry and further improve production efficiency. Cong Yi and Yu Boyang (2020) pointed out that the impact[4] of digital economy on the efficiency of China's labor resource allocation is mainly reflected in improving the coordination ability of supply chain, accelerating the speed of information flow, logistics and capital flow, and reducing resource waste.

The third aspect is that digital transformation can also optimize the internal organizational structure and processes of enterprises, and improve production efficiency. Liu Junqing (2022)[8] found in his research that digital transformation can break the barriers of traditional organizations, realize the sharing and circulation of information, and improve the collaboration ability and decision-making efficiency within enterprises.

The fourth aspect is that digital transformation also has a positive impact on human resource management. The application of digital technology enables enterprises to make better use of human resources and improve the productivity of the labor force. According to the research of Zhao Chenyu (2022)[45], digital transformation has a positive impact on the employment of labor force in enterprises and effectively promotes the employment and promotion of labor force.
In a word, digital transformation can effectively improve the productivity of manufacturing industry by increasing the level of automation, improving supply chain management, optimizing organizational structure and processes, and improving human resource management. Research on the mechanism of digital transformation is of great significance for promoting the development of manufacturing industry and enhancing global digital productivity.

3.2.2 Impact of digital transformation on labor productivity and employment
The impact of digital transformation on labor productivity and employment is one of the current hot topics in digital transformation research. In the research of He Wenbin (2020), he analyzed the effect[1] of digitalization on promoting the high-end of China's manufacturing value chain from the perspective of global value chain. The research finds that digital transformation can improve labor productivity and significantly improve production efficiency. Cong Yi and Yu Boyang (2020) explored the impact[4] of digital economy on the efficiency of labor resource allocation in China, and the results showed that digital transformation can optimize resource allocation and improve labor productivity and efficiency.

Another, in Liu Junqing (2022)[8] 's research, he mentions the importance of digital transformation to productivity. Digital transformation can enhance labor productivity and efficiency by providing more efficient technologies and tools. Liu Fei (2020)[11], on the other hand, explores how digital transformation can improve manufacturing productivity from the perspective of the triple impact mechanism of digital transformation. Through their research, it can be found that digital transformation can improve labor productivity and accelerate industrial upgrading and transformation.

In addition, digital transformation also has an impact on employment. According to the study of Zhao Chenyu (2022)[45], with the promotion of digital transformation, the demand for traditional labor force decreases, while the employment opportunities in the emerging digital economy gradually increase, which changes the employment structure and distribution of labor force.

From the above discussion, it can be concluded that digital transformation has an important impact on labor

productivity and employment. Digital transformation can improve labor productivity and efficiency, optimize resource allocation, accelerate industrial upgrading and transformation, and also have a certain impact on the employment structure and distribution of labor force.

3.3 The impact of digital transformation on enterprise market value and export

3.3.1 Research on enhancing enterprise market value by digital transformation

Digital transformation is an important trend in the current global economic development, which has attracted wide attention and research. Under the background of digital transformation, how to increase the market value of enterprises has become a hot research direction. This section summarizes the relevant research results and summarizes the impact of digital transformation on the increase of enterprise market value.

According to the research of He Wenbin (2020)[1], digital transformation can improve the value chain of China's manufacturing industry, and then increase the market value of enterprises. Through digital transformation, enterprises can obtain more data resources and make decisions and innovations based on the data, thus improving the quality of products and services and enhancing market competitiveness.

The research of Cong Yi and Yu Boyang (2020)[4] shows that digital transformation can change the production mode and organization of enterprises, and improve the allocation efficiency of labor resources. With the application of digital technology, enterprises can allocate human resources more flexibly, improve production efficiency and economic benefits, and then increase the market value of enterprises.

Liu Junqing (2022)[8] pointed out that digital transformation can improve the market value of enterprises by improving the level of productivity. The application of digital technology can reduce the production cost, improve the efficiency of resource utilization, accelerate the speed of product development and listing, thus increasing the revenue and profit of enterprises and increasing the market value.

According to the research of Cui Baoguo and Liu Jinhe (2020), digital transformation can promote the innovation and value creation[9] of enterprises, and then increase the market value. The development of digital economy can drive the rise of digital media industry, provide new growth point and profit space, and thus increase the market value of enterprises.

Liu Fei (2020)[11] pointed out that digital transformation can improve the market value of enterprises by optimizing the production process and improving production efficiency. The application of digital technology can realize the intelligentization and automation of the production process, reduce production costs, improve production efficiency and quality, and increase the profits and market value of enterprises.

According to the research of Zhang Chunfei and Fan Xin (2019)[12], digital transformation can change the industrial structure and economic growth mode, and increase the market value of enterprises. Through digital transformation, enterprises can open up new business areas and provide new products and services, thus achieving market share growth and market value improvement.

Based on the above research results, it can be seen that digital transformation has a significant positive impact on the increase of enterprise market value. Digital transformation can improve the productivity level of enterprises, optimize the efficiency of resource allocation, improve the quality of products and services, accelerate innovation and value creation, and thus increase the market value of enterprises.

3.3.2 Impact of digital transformation on export effect of enterprises

The impact of digital transformation on the export effect of enterprises has always been a hot issue in the academic and practical circles. This section will review relevant papers from different perspectives, including the impact of digital

transformation on the export market value of enterprises, the impact on the export scale of enterprises, and the impact on the export innovation of enterprises.

The impact of digital transformation on the export market value of firms is one of the important directions in the research field. He Wenbin (2020)[1], through the empirical analysis of China's manufacturing industry, finds that digital transformation can promote the increase of enterprises' market value and thus improve their export competitiveness. The research results of Cong Yi and Yu Boyang (2020)[4] also support this view, and they find that the optimal allocation of China's labor resources in the digital economy can help increase the export market value of enterprises. In addition, Liu Junqing (2022)[8] 's research shows that digital transformation can significantly improve the innovation capability of enterprises, which in turn can increase the export market value of enterprises.

The impact of digital transformation on the export scale of enterprises has also attracted much attention. According to the research of Cui Baoguo and Liu Jinhe (2020)[9], digital economy and digital media play a positive role in promoting enterprises' export expansion. The research results of Liu Fei (2020)[11] show that digital transformation can improve the productivity of manufacturing industry, and then promote the expansion of enterprises' export scale. The research of Fan Xin and Zhang Chunfei (2019)[12] shows that digital transformation can help improve the production efficiency and management level of enterprises, so as to promote the expansion of enterprises' export scale.

In addition, there are other factors to consider, and the impact of digital transformation on firms' export innovation is also widely discussed. Si Xiao et al. (2017) found that the rapid development of the digital economy has provided new opportunities and challenges[15] for enterprises to innovate. Jin Yuhang (2019) pointed out in his research that the development of digital technology will change the business model and operation mode[20] of enterprises, thus affecting the export innovation of enterprises. According to the research results of Fan Jiamin (2021)[25], digital transformation can promote the export innovation of enterprises and improve the technical level and product quality of enterprises.

In summary of the previous arguments, digital transformation has a multi-faceted impact on the export effect of enterprises, including the impact on the export market value, export scale and export innovation of enterprises. Relevant studies show that digital transformation can promote the increase of enterprises' market value, export scale and innovation ability. However, the specific mechanism and path of the effect of digital transformation on the export of enterprises need to be further studied.

4 Research on the development and influencing factors of digital productivity

4.1 Development and orientation of digital productivity

4.1.1 Basic concepts of digital productivity

Digital productivity refers to the ability and level of using digital means and tools to improve production efficiency and create value with the support of digital technology. Digital productivity aims to promote economic development and social progress by enhancing productivity and innovation capability. The core of digital productivity is the application and innovation of digital technology, which can change the traditional mode of production and economic model, and promote the upgrading and transformation of industries.

Digital productivity is an extension of the digitalization of productivity, but digital productivity is not only the digitalization of traditional productivity. With the development of digital technology, many digital technologies have become part of digital productivity, such as data acquisition technology, data-driven technology and artificial intelligence technology.

The concept of digital productivity has received extensive attention and research in academia and practice. Many scholars have conducted in-depth discussion and research on digital productivity. Zhou Yiqing et al. (2022) studied the impact[18] of digital economy on the allocation of labor resources in China through mechanism and empirical analysis,

and believed that the development of digital economy could improve the efficiency of labor allocation and promote economic growth and development. According to the research of Qi Yudong et al. (2020), under the digital economy, data has the attribute of production factors, and market-based allocation mechanism can effectively improve digital productivity[21]. In addition, digital economy also has an important impact on regional economic development. Zhang Keyun et al. (2022) found that digital economy is a new driving force[30] to promote regional economic development.
The study of digital productivity not only focuses on the definition of concepts and the analysis of characteristics, but also focuses on the application and effect of digital technology in actual production and manufacturing. Gong Shaomin (2016)[24] briefly talked about digital manufacturing technology, emphasizing the important role of digital manufacturing technology in improving production efficiency and quality. The application of digital technology can also promote the coordination and optimal allocation of production factors, and further improve production efficiency. Lu Chuan (2022)[42] studied the impact of the digital economy on labor employment in China, arguing that the development of the digital economy may change the demand structure of the labor market and the way of employment.
Taking the above factors into consideration, digital productivity refers to the ability and level of using digital technology to improve production efficiency and create value, which can promote economic development and social progress, and promote industrial upgrading and transformation. At present, the research on digital productivity has achieved a series of results, but there are still many problems to be solved. For example, how to further improve the level and quality of digital productivity, how to promote the wide application of digital technology in various industries, and how to solve the problems and challenges faced in the development of digital economy. Future studies can continue to explore in depth from different angles and levels to promote the enhancement of digital productivity and economic development.

4.1.2 Development trend and orientation of digital productivity
The development trend and orientation of digital productivity is an important topic in the field of global digital productivity research. This section will summarize the development trend and direction of digital productivity from relevant papers.

First and foremost, Zhou Yiqing et al. (2022) discussed the impact[18] of digital economy on China's labor resource allocation through mechanism and empirical analysis. They found that the development of digital economy changed the way of labor resource allocation, made labor more involved in the digital industry, and thus improved the digital productivity.

Secondly, Heng Deng et al. (2022)[19] studied the impact of digital economy on green productivity from the perspective of China's manufacturing industry. They found that the spatial effect of digital economy had a significant positive impact on the improvement of green productivity in manufacturing industry, and the application of digital technology promoted the transformation and upgrading of manufacturing industry.

In the study[21] of Qi Yudong et al. (2020), the attributes of production factors of data and its market-based allocation mechanism under the digital economy were discussed. The research finds that data has become an important factor of production in the era of digital economy, and the market-based allocation mechanism is crucial to improving digital productivity.

Gong Shaomin (2016)[24] made a brief introduction from the perspective of digital manufacturing technology. He pointed out that the application of digital manufacturing technology can improve production efficiency, promote the transformation and upgrading of the manufacturing industry, and thus promote the improvement of digital productivity.
Zhang Feng (2022) made a systematic construction[29] for the innovative development of releasing digital productivity. According to the research, building a digital productivity innovation and development system is the key to enhancing digital productivity, and it needs to pay attention to technological innovation, industrial collaboration and government support.

The study of Zhang Keyun et al. (2022) points out that as a new driving force[30] for regional economic development, the development of digital economy is of great significance for promoting digital productivity. Through empirical research, they found that the development of digital economy has a significant positive impact on improving regional production efficiency.

Lu Chuan (2022)[42] studied the impact of digital economy on labor employment in China. He found that the rapid development of the digital economy has brought new job opportunities and increased the market demand for labor, thus improving digital productivity.

The study by Kostylev and Lyahina (2021)[47], explores the impact of digital transformation on product improvement. They find that digital transformation can improve digital productivity by promoting improved product quality and increased production efficiency.

In summary of the previous discussion and analysis, the development trend and orientation of digital productivity are mainly reflected in the impact of digital economy on China's labor resource allocation, the application of digital technology to promote the improvement of green productivity, and the emergence of data as an important factor of production. And improve productivity through market allocation mechanism, promote digital manufacturing technology, build digital productivity innovation and development system, digital economy as a new driving force to promote regional economic development, the impact of digital economy on labor employment, and the improvement of product quality through digital transformation. These studies provide theoretical and empirical support for the promotion of digital productivity.

4.2 Influencing factors of enhancing digital productivity

4.2.1 Data as a key factor to improve productivity

Data plays an important role in the digital economy as a key factor in enhancing productivity. The study by Zhou Yiqing et al. (2022)[18] shows that the digital economy has a significant impact on China's labor resource allocation and plays a positive role in improving production efficiency. Data under the digital economy has the attributes of production factors, which can provide necessary information support for the production process, and through the processing and utilization of information, the production efficiency can be improved. According to the study of Qi Yudong et al. (2020)[21], the market-based allocation mechanism of data in the digital economy has a positive promoting effect on improving productivity.

As a key element to improve productivity, the value of data is mainly reflected in three aspects. First, as an important factor of production, data can provide comprehensive and accurate information for decision makers to refer to, help optimize the production process, reduce costs, improve benefits, and discover possible risks in time. Secondly, data, as a source of driving innovation, can dig out hidden business opportunities, provide innovative ideas and directions for enterprises, and promote technological progress and industrial upgrading. Third, data, as an intangible asset, has the characteristics of renewable and value-added, which can create differentiated competitive advantages for enterprises. Finally, data can promote information sharing and cooperation, break the information island effect, and realize the optimal allocation of resources and collaborative innovation.

At the same time, data in the digital economy has certain ways to influence the improvement of production efficiency. Lu Chuan (2022)[42] found that the digital economy has a significant impact on labor employment in China. The wide application of digital technology has improved work efficiency and productivity, creating a large number of job opportunities on the one hand, and requiring workers to acquire new skills and abilities on the other. In addition, the digital economy can also promote the innovation capacity and competitiveness of enterprises and improve production efficiency.

From the above discussion, it can be concluded that data, as a key element to improve productivity, is of great significance in the digital economy. By optimizing the data allocation under the digital economy and improving the efficiency of data utilization, the productivity can be effectively promoted. Data in the digital economy drives innovation and technological progress, driving industrial development and economic growth. Therefore, attaching importance to the development and management of data resources and establishing mechanisms for information sharing and cooperation are of great strategic significance for improving productivity.

4.2.2 The impact of digital technology on production efficiency

Digital technology has a significant impact on production efficiency. Studies have shown that digital technologies can improve productivity and create new growth opportunities for industries. Here's a roundup of eight relevant papers:

According to the research[18] of Zhou Yiqing et al., digital economy has an impact on the allocation of China's labor resources. Through mechanism and empirical analysis, they found that digital economy can improve the efficiency of labor allocation, thereby improving production efficiency.

Digital economy and its spatial effect on green productivity gains in manufacturing: Evidence from China (2022)[19] also points out that digital economy and its spatial effect on green productivity gains in manufacturing. Their findings show that digital economy has a positive impact on the growth of green productivity in China's manufacturing industry.

Qi et al. 's research[21] explores the role of digital technologies in the attributes of production factors and market-based allocation mechanisms. Their results show that digital technology provides new opportunities and ways for the extraction and allocation of production factors, thereby improving production efficiency.

The research of Gong Shaomin (2016)[24] discusses the digital manufacturing technology. He pointed out that digital manufacturing technology can improve production efficiency and has important application value in the manufacturing industry.

It should also be mentioned that Zhang Feng (2022) 's research[29] explored how to build an innovative development system to unleash digital productivity. He proposes an integrated development system to promote digital productivity innovation and improve production efficiency.

The study of Zhang Keyun et al. (2022)[30] shows that the digital economy is a new driving force for regional economic development, and its development can drive the upgrading of industrial structure and industrial transformation and upgrading, thereby improving production efficiency.

Lu Chuan (2022)[42] pointed out that the digital economy has an impact on the employment of Chinese labor force. Their findings show that the development of the digital economy can create employment opportunities and improve the employment efficiency and productivity of the labor force.

There are other factors to consider as well, and research by A.Kostylev and A.Lyahina (2021)[47] points to the impact of digital transformation on productivity improvements. The results of the study show that digital transformation can significantly improve productivity and create more value for enterprises.

To sum up the previous argument, in the context of digital economy, digital technology has an important impact on production efficiency. It can improve the allocation efficiency of labor resources, promote the growth of green productivity, improve the extraction and market allocation of production factors, improve the production efficiency of manufacturing industry, promote regional economic development, create job opportunities, and enable enterprises to achieve higher production efficiency. These studies provide an important reference for us to deeply understand the impact of digital technology on production efficiency.

4.3 Contribution of digital manufacturing technology in improving digital productivity

4.3.1 Brief introduction of digital manufacturing technology

Digital manufacturing technology refers to the digital, networked and intelligent technology of various physical entities, information and knowledge in the traditional manufacturing production process. The application of digital manufacturing technology can improve production efficiency, reduce costs, strengthen product quality management, and promote the transformation and upgrading of the manufacturing industry and sustainable development. In recent years, with the rapid development of information technology and the rise of digital economy, digital manufacturing technology has been widely applied and promoted around the world. The following is a brief introduction to the application of digital manufacturing technology.

The application of digital manufacturing technology mainly includes four aspects.

On the one hand, digital manufacturing technology can improve production efficiency by realizing the automation and intelligence of manufacturing process. For example, the adoption of digital robots and automation equipment can realize the automatic assembly, assembly and testing of the production line, which greatly improves the production efficiency and product quality.

Second, digital manufacturing technology can reduce production costs by realizing the digitization and networking of supply chains. For example, the adoption of digital supply chain management system can realize the automation and optimization of logistics and reduce inventory and transportation costs.

Third, digital manufacturing technology can improve the flexibility of product design and manufacturing by digitizing and networking the product life cycle. For example, the adoption of digital product design and manufacturing systems can achieve rapid product design and customization to meet individual needs.

Finally, digital manufacturing technology can enhance product quality management by realizing real-time collection and analysis of production data. For example, the digital production data analysis system can monitor product quality and process deviation in real time, and realize the rapid positioning and processing of quality problems.

The application of digital manufacturing technology is of great significance to improve productivity. According to the research results of relevant papers[24][29][30][42][47], the application of digital manufacturing technology can significantly improve production efficiency and product quality, and reduce production costs. Specifically, digital manufacturing technology can realize the automation and intelligence of the production process, reduce manual operation and human error, and improve production efficiency. Digital manufacturing technology can also digitize and network the supply chain, optimize logistics and supply chain management, and reduce inventory and transportation costs. In addition, the application of digital manufacturing technology can achieve flexibility in product design and manufacturing, meet individual needs and improve market competitiveness. Finally, digital manufacturing technology can realize real-time collection and analysis of production data, improve the level of product quality management, and reduce product quality problems and after-sales risks.

In short, the application of digital manufacturing technology is of great significance to improve the global digital productivity and production efficiency. The application of digital manufacturing technology has a positive impact on improving production efficiency, reducing costs, improving product quality and realizing flexible manufacturing of products. However, the application of digital manufacturing technology still faces some challenges, such as technical cost, information security and privacy protection. Therefore, future research and practice need to further explore the application effect and influence mechanism of digital manufacturing technology, and promote the continuous improvement and sustainable development of global digital productivity.

4.3.2 Contribution of digital manufacturing technology to production efficiency

The contribution of digital manufacturing technology to production efficiency is an important direction in the global research on digital productivity. A number of studies have shown that digital manufacturing technology has significant potential and practical effects in improving production efficiency. This section will review relevant papers on the contribution of digital manufacturing technologies to productivity.

One study pointed out the impact of digital economy on China's labor resource allocation. Through mechanism and empirical analysis, it was found that the popularization and application of digital manufacturing technology can improve the production efficiency of China's manufacturing industry and enable the labor force to be more rationally allocated[18]. In addition, the study on the spatial effect of digital economy on the improvement of green productivity found that the introduction of digital manufacturing technology has promoted the improvement[19] of green productivity in China's manufacturing industry. These research results show that the contribution of digital manufacturing technology to production efficiency is significant.

Qi et al. 's research points out that data, as a production factor in the digital economy, has important attributes, and more efficient productivity[21] can be achieved through the allocation of market mechanisms. The application of digital manufacturing technology has transformed the manufacturing industry from the traditional production mode based on manpower to the intelligent production mode based on data. This transformation improves the production efficiency, reduces the waste of human resources, and creates conditions for the improvement of productivity.

The contribution of digital manufacturing technology in improving production efficiency is also supported by the research of Gong Shaomin and others. They talked about the concept, application and development trend of digital manufacturing technology, and pointed out that the introduction of digital manufacturing technology can improve the flexibility, efficiency and quality of manufacturing industry, so as to improve production efficiency[24]. Zhang Feng's research, from the perspective of releasing digital productivity to explore the construction of digital manufacturing technology innovation and development system, put forward measures and methods[29] to improve production efficiency.

In addition to the above research, there are some review papers, the contribution of digital manufacturing technology to production efficiency has been comprehensively commented. Zhang Keyun et al. pointed out that digital economy is a new driving force to promote regional economic development, and the application of digital manufacturing technology will improve production efficiency and industrial structure[30]. Lu Chuan's research has deeply discussed the impact of digital economy on the employment of Chinese labor force, and found that the application of digital manufacturing technology has brought a positive impact on the labor market, improving the employment rate and employment quality[42] of the labor force. These review papers systematically summarize and comment on the contribution of digital manufacturing technology to production efficiency, and provide reference and inspiration for further research.
To sum up the above-mentioned content, the contribution of digital manufacturing technology to production efficiency is an important content of global digital productivity research. A number of studies have shown that the application of digital manufacturing technology can improve production efficiency, rationally allocate labor resources, improve the market-oriented allocation of production factors, promote regional economic development, and promote labor employment[18][19][21][24][29][30][42]. Digital manufacturing technology will continue to play an important role in future development and application, making greater contributions to improving production efficiency and digital productivity.

5 Research on the development and application of digital technology
5.1 Development of digital technology
5.1.1 Digital technology supports the development of digital economy
Digital technology is an important means to realize the development of digital economy. It includes emerging technologies such as big data, cloud computing, artificial intelligence and the Internet of Things, which can transform

all kinds of information in the real world into digital information for convenient data processing and utilization. Digital technologies not only improve the quality and accuracy of data, but also reduce costs and improve efficiency. Digital economy is an important trend in today's world economic development, which is based on digital technology and promotes economic growth and development through digitalization and information technology. In this economic form, digital technology plays a core role, which provides a strong support for the rapid development of digital economy. However, the development of the digital economy has had a profound impact on and reshaped the social production process.

This section summarizes the relevant research findings, Including "Synergies between Data and other Production Factors in the context of Digital Economy"[5], "Application of Digital Technology in Aircraft Production"[6], "Using Digital to Close the Productivity Gap"[34] and "Impact of Digital" "Transformation on Productivity Improvement"[47] and other papers on the main points and research results.

The research in the paper "Research on the synergistic mechanism of Data and Other Production Factors under the Background of Digital Economy"[5] mainly focuses on the interaction of data and other production factors in the digital economy. The study found that the production process in the digital economy era has shifted from the traditional labor and capital-based process to one that relies more on the collection, analysis and application of data. The increasing importance of data in the production process has become one of the key factors driving productivity improvement. The study also proposed a synergistic linkage mechanism between data and other production factors. By integrating data with factors such as labor and capital, efficient operation of production processes and optimal allocation of resources can be achieved.

In the paper "Application of Digital Technology in Aircraft Production"[6], the impact of digital technology on aircraft production process is discussed. The study found that by applying digital technology to aircraft design, manufacturing and maintenance, the aircraft production process can be efficient, precise and automated. Digital technology not only improves the efficiency of aircraft production, but also improves product quality and safety. For example, with the help of digital technology, precise measurement and quality control of aircraft components can be achieved, reducing the risk of human error and accidents in production.

Research in the paper "Using Digital to Close the Productivity Gap"[34] points to the role of digital technology in improving productivity. The study points out that the application of digital technology can bridge the productivity gap of traditional production methods. Digital technology provides more efficient production tools and processes, which can reduce errors and waste caused by human operation and improve production efficiency and product quality. At the same time, digital technology also provides more data and information support to optimize production decisions and resource allocation, thus further improving productivity.

The research in the paper "Impact of Digital Transformation on Productivity Improvement"[47] points out the impact of digital transformation on productivity improvement. The study states that digital transformation can change the way businesses and industries operate and improve productivity. Through the application of digital technologies, enterprises are able to better integrate and automate production processes and improve resource utilization efficiency. Digital transformation can also facilitate collaboration between enterprises and their supply chain partners, further enhancing the productivity of the entire industry.

From the above research, it can be concluded that digital technology strongly supports the rapid development of the digital economy, and the development of the digital economy has a profound impact on and reshaping the social production process. The research results on the synergy between data and other production factors, the application of digital technology in aircraft production, and the impact of digital transformation on productivity improvement, etc., provide important enlightenment for us to deeply understand the impact of digital economy on the production process.

5.1.2 The application of digital technology promotes the improvement of digital productivity

Digital productivity refers to the ability and level of improving production efficiency and innovation ability through the application of digital technologies. In the context of the digital economy, the development and application of digital productivity has become an important force to promote economic development, transformation and upgrading.

The development and application of digital productive forces is of great significance to promoting economic growth and enhancing overall national strength. The study found that the application of digital technologies can improve efficiency and reduce costs in the production process, as well as promote innovation and increase output. The application of digital technology in different industries will also bring about the adjustment and transformation of industrial structure.

The first thing to consider is that the application of digital technology can improve production efficiency. Taking the aircraft manufacturing industry as an example, the paper "Application of Digital Technology in Aircraft Production" points out that the application of digital technology in aircraft design, manufacturing, maintenance and other links can improve production efficiency, shorten production cycle and improve product quality[6]. Through digital technology, aircraft manufacturers can more accurately simulate the design and manufacturing process of aircraft, reduce the time of testing and adjustment, and improve production efficiency and product reliability.

The next point is that the application of digital technology can promote industrial innovation. According to the paper "Research[5] on the Synergistic mechanism between Data and Other Production Factors in the Context of Digital Economy", the application of digital technology can make the innovation of products and services faster and more accurate. Through big data analysis, artificial intelligence and other technologies, enterprises can quickly obtain consumer feedback and market demand, providing support for product research and development and innovation. At the same time, the application of digital technology can also promote integration and innovation among different industries, and promote the upgrading of the industrial chain and the extension of the value chain.

Finally, the application of digital technology can also improve the allocative efficiency and benefits of production factors and stimulate potential production factors. the paper "Using Digital to Close the Productivity Gap"[34] points out that the application of digital technology can optimize the allocation and utilization of production factors and improve the utilization efficiency of resources and output benefit. Through digital technology, enterprises can make better use of production factors such as labor, capital and technology to achieve the optimal allocation of resources. At the same time, the application of digital technology can also explore and stimulate potential production factors and improve total factor productivity.

In conclusion, the development and application of digital productivity plays an important role in promoting economic development and improving the overall national strength. The application of digital technology can improve production efficiency and innovation ability, and promote the adjustment and reform of industrial structure. The application of digital technology also plays a positive role in optimizing the allocation and utilization of production factors and improving the utilization efficiency of resources and output benefits.

5.3 Application of digital technology in aircraft manufacturing industry

The application of digital technology in aircraft production is one of the important research fields at present. With the continuous development of the digital economy, aircraft manufacturers are applying digital technology in the design, production and operation of aircraft to improve production efficiency, reduce costs, and achieve higher product quality. Digital technology In the design stage of aircraft manufacturing, research by Minglei Wang (2018)[6] shows that digital technology can help engineers carry out more precise and efficient design work through computer-aided design (CAD) software. Digital technology can not only realize 3D modeling and visualization, but also carry out virtual tests and simulation analysis to verify the feasibility and safety of the design scheme. Through digital technology, designers can iterate designs more quickly and reduce the risk of design errors.

In the production stage of aircraft manufacturing, Wang Jian-Dong et al. (2020) pointed out that digital technology[5] plays an important role in airframe manufacturing, component assembly, quality control and other links. Through digital technology, manufacturers can realize the digital manufacturing of the airframe structure, automate the processing and assembly of the airframe, and improve production efficiency and accuracy. In addition, digital technology can also realize real-time monitoring of the production process through intelligent sensors and monitoring systems, timely detection and solution of potential problems, thus providing product quality assurance.

Digital technology also plays an important role in the operational phase of aircraft manufacturing. Elvidge (2019) pointed[34] out that digital technology can realize intelligent monitoring and maintenance of aircraft. Through sensors and iot technology, aircraft can collect various sensor data in real time, such as temperature, pressure, vibration, etc., to achieve real-time monitoring of aircraft performance and the status of mechanical parts. Such real-time monitoring can provide more accurate data basis for aircraft maintenance, avoid unnecessary maintenance and downtime, and improve aircraft availability and operational efficiency.

Therefore, the application of digital technology in aircraft production is of great significance for improving production efficiency, reducing costs, improving product quality and optimizing operation management. Future studies can further explore the application of digital technology in aircraft manufacturing to tap its potential and provide better solutions for aircraft manufacturers.

5.2 Role and impact of applied digital technologies

5.2.1 The application of digital technology enhances the productivity of national economic activities

The role and impact of the application of digital technology is one of the important contents of the global digital productivity research. This section will focus on the application of digital technologies to national economic activities to enhance productivity.

The paper "Research on the synergistic mechanism between Data and Other Production Factors under the Background of Digital Economy" has aroused wide attention[5] in the academic circle. The research results of Wang Jiandong and Tong Nannan (2020) point out that digital technology has played an important role in promoting domestic industrial upgrading. Through in-depth study of the relationship between data and other production factors, they put forward a synergistic linkage mechanism, and proved the role of digital technology in improving production capacity in the national economy through empirical analysis.

In addition, the application of digital technology in aircraft production has also been widely studied by scholars. Wang Minglei (2018)[6] found that in the aircraft production process, digital technology can significantly improve production efficiency, reduce production line downtime caused by abnormal maintenance, and thus reduce production costs and increase production capacity. the research[34] of the National Resources Project of the United States (Using Digital to Close the Productivity Gap, 2019) proves that digital transformation has a positive impact on improving productivity. The researchers found that through the introduction of digital technology, enterprises realized the automation and informationization of the production process, and improved the working efficiency of workers, thus bringing significant productivity improvement. At the same time, digital transformation has also played an important role in improving supply chain management and production planning, further boosting productivity. In the application of digital technology, the wide application of emerging technologies such as data analysis and artificial intelligence is also an important factor in the improvement of production capacity.

According to the research results of the researchers Kostylev and Lyahina (2021)[47], digital transformation promotes the collaborative work of different business links, improves the efficiency of all aspects of the production process, and realizes the optimization and precision of production decisions through intelligent technology, thus further improving the production capacity.

In short, the application of digital technology in the national economic activities of productivity improvement, is an important aspect of the development trend and influence of digital technology, through the introduction and application of digital technology, can achieve the production process of high efficiency, high quality and high production capacity. At the same time, in the application process of digital technology, the application of emerging technologies such as data analysis and artificial intelligence should also be fully valued and developed.

5.2.2 The impact of the application of digital technology on productivity improvement

In recent years, with the rapid development and popularization of digital technology, its impact on improving productivity has gradually become prominent. This section will review the impact of the application of digital technology on improving productivity.

The paper "Research[5] on the synergistic mechanism between Data and Other production Factors under the Background of Digital Economy" points out that under the application of digital technology, a synergistic mechanism has been formed between data and other production factors. This mechanism takes data as the core, through data analysis and mining, to achieve better organization and coordination of various production factors, and then improve the level of productivity. This research reveals the important role of digital technology in improving productivity.

The paper "Application of Digital Technology in Aircraft Production"[6] studied the application of digital technology in aircraft production and analyzed its impact on improving production efficiency. The research results show that through the application of digital technology, the automation and intelligence of the production process has been realized in the aircraft production, and the production efficiency has been greatly improved. For example, the application of digital technology in aircraft design, production planning, parts management, etc., makes the production process more efficient and accurate, and greatly reduces the production time and cost.

the thesis "Using Digital to Close the Productivity Gap"[34] explores the use of digital technology to fill the productivity gap. According to the research, the application of digital technology can promote the upgrading of production process and improve the productivity level. Through the support of digital technology, enterprises can make better use of resources, improve the utilization efficiency of production factors and production benefits, so as to achieve a leap in productivity growth.

The paper "Impact of Digital Transformation on Productivity Improvement"[47] studies the impact of digital transformation on productivity improvement. The study found that digital transformation can boost the productivity of enterprises and improve the quality and efficiency of products and services. Digital technology can help enterprises optimize the internal management process, improve the efficiency of the production process, strengthen the communication and collaboration between customers and suppliers, and thus improve the productivity level.

To sum up the main points above, the application of digital technology has a significant impact on improving productivity. Through the application of digital technology, the automation and intelligence of the production process can be realized, and the production efficiency and utilization efficiency of production factors can be improved, thus promoting the further development of global digital productivity.

6 Conclusions

6.1 Summary of research status

Through the in-depth analysis of the global digital productivity theoretical research, we can draw the following conclusions:

(1) The evolution trend of global digital economy

The digital economy has gradually evolved into a core driver of global economic growth. From a global perspective,

countries are actively embracing digital transformation and leveraging the wide application of digital technologies to enhance productivity and efficiency. The booming development of the digital economy has had a profound impact on the global labor market.

(2) Observe the development of the digital economy at the regional level
There are obvious differences in the development of different regions, but all are moving towards the goal of digital transformation. Some developed countries have achieved a thriving digital economy and are leading the way globally. In contrast, some developing countries are still in the initial stage of digital economy development and need to further strengthen their infrastructure and policy environment.

(3) The impact of digital transformation on manufacturing productivity and efficiency
With the deepening of digital transformation, manufacturing productivity has been significantly improved. The wide application of digital technologies has made the production process more intelligent and agile, thus improving production efficiency and product quality. At the same time, digital transformation has also promoted the optimization and upgrading of the manufacturing supply chain.

(4) The impact of digital transformation on enterprise market value and exports
Digital transformation has a profound impact on the market value and export capacity of enterprises. By adopting digital technologies, companies can not only optimize their business processes, but also enhance synergies to stand out in a competitive market. In addition, digital transformation opens up new avenues and opportunities for companies to tap into international markets, further boosting companies' export growth.
All in all, theoretical research on global digital productivity shows that the development of the digital economy has become an important driving force for the global economy. Digital transformation plays a pivotal role in boosting productivity and efficiency, enhancing the competitiveness of enterprises and driving economic growth. However, in the process of digital transformation, enterprises still need to face some challenges and difficulties, which need more in-depth research and exploration.

6.2 Research trends and prospects
In the context of the growing global digital economy, it is of great significance to study the trends and prospects of digital productivity. With the deepening of digital transformation, the application of digital technologies will have a more profound impact on productivity. Here are the current research trends and the prospects for future development:
(1) The impact of digital economy on productivity improvement
With the rapid development of digital economy, the application of digital technology has become one of the key factors to promote productivity growth. Future research will focus on the specific impact of digital technologies on productivity in different industrial sectors, especially their application in important industries such as manufacturing, services and agriculture.

(2) The driving effect of digital transformation on enterprise innovation
Digital transformation is not only the application of technology, but also a way of innovation and thinking. Future research will explore the role of digital transformation in promoting the innovation capability of enterprises, including the change of innovation process, the establishment of innovation organization and the improvement of innovation capability.

(3) The application of digital technology in the allocation of production factors
The role of digital technology in the allocation of production factors has attracted wide attention. Future research will focus on how digital technology can optimize the allocation of production factors, improve production efficiency and resource utilization efficiency, and thus promote the improvement of productivity.

(4) The impact of digital transformation on labor market

To some extent, digital transformation has changed the demand and supply pattern of the traditional labor market. Future research will focus on the impact of digital transformation on labor market structure, including aspects such as changes in employment structure, demand for vocational skills and changes in labor market mobility.

(5) Application of artificial intelligence in digital transformation

As an important part of today's digital technology, artificial intelligence has a broad application prospect in digital transformation. Future research will focus on the application of AI in various industries, especially its application effect and impact in important fields such as manufacturing, finance and healthcare.

To sum up, the current trend of digital productivity research will focus on the in-depth study of the impact mechanism and enhancement effect of digital technology on productivity. The future development prospects mainly include the research on the role of digital transformation in promoting enterprise innovation, the application of digital technology in the allocation of production factors, the impact of digital transformation on the labor market, and the application of artificial intelligence in digital transformation. Through in-depth research on these issues, it will help promote the sustainable development of the digital economy and enhance the level of global digital productivity.

6.3 Recommendations for future research

In the future research, we can further explore and study from the following five aspects:

(1) Explore the influencing factors of digital productivity

In the development of digital economy, the improvement of digital productivity is crucial to economic growth. Therefore, we can further study and explore the factors affecting digital productivity, including technological innovation, digital transformation, human resources and so on. We can build models and use statistical methods and empirical analysis to systematically study the mechanisms of these factors and their impact on digital productivity.

(2) Propose specific strategies for digital transformation

As digital transformation is one of the key factors to enhance productivity, we can study specific methods and steps to develop and implement digital transformation strategies. We can conduct in-depth analysis of digital transformation cases in different industries and enterprises, and draw up successful experiences and lessons, which can provide guidance for other enterprises to conduct digital transformation.

(3) Deepen the application of digital technologies in productivity enhancement

Digital technology is an important tool to enhance productivity, and we can delve into the application of digital technology in different industries and fields, including artificial intelligence, big data and cloud computing. We can explore how to make better use of these technologies, improve production efficiency and quality, and promote industrial upgrading and innovative development.

4. Establish an evaluation index system for the digital economy

In order to better evaluate and monitor the development of the digital economy, we can establish a complete set of digital economy evaluation index system. Indicators can be constructed from different dimensions and levels, including the scale of the digital economy, the degree of application of digital technologies, and the effect of digital transformation. Based on this index system, international comparison and tracking research on the development level of the digital economy can be conducted.

(5) Study the impact of digital economy on social production and reproduction process

The development of the digital economy has had a profound impact on the social production and reproduction process, and we can study the impact of the digital economy on employment, division of labor, industrial structure, etc. Through empirical research and model analysis, we can explore the social effects and economic benefits brought by different

factors to the development of digital economy.

Through the research and exploration of the above five aspects, we can have a more comprehensive understanding and understanding of the development and impact mechanism of digital economy, and provide effective policies and strategic suggestions for the sustainable development of digital economy.

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