Research on the influence mechanism of digital economy on the performance of manufacturing enterprises

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Abstract: In view of the slowdown in the overall growth of the manufacturing industry, the increasing pressure on enterprises to operate, the regional heterogeneity in the development of digital economy, and the risk of bottleneck of key technologies, this paper applies the transaction cost theory, the scope economy theory and the value chain theory to analyze the mechanism of digital economy affecting the performance of manufacturing enterprises. A comprehensive analysis framework of the impact of digital economy on manufacturing enterprise performance is constructed. To clarify the theoretical logic and mechanism of action that the development of digital economy affects the performance of manufacturing enterprises has an important guiding significance for promoting the high-quality development of manufacturing industry in our country.

1. Introduction

The digital economy is embedded in all aspects of social production and has become a major engine of economic development around the world. It has promoted the transformation and upgrading of traditional industries and provided important support for the high-quality development of manufacturing. To clarify the theoretical logic and mechanism of action that the development of digital economy affects the performance of manufacturing enterprise has an important guiding significance for promoting the high-quality development of manufacturing industry in our country in the digital economy era.

We must grasp the development trend and laws of digital economy, promote the healthy development of the digital economy of our country, and develop the digital economy has become a national strategy. The goal of our efforts: to give full play to the role of advanced digital technologies, use the data of new production factors, promote the highly integrated development of the real economy and the digital economy [1], improve the level of manufacturing services, upgrade the product value chain of manufacturing enterprises, and optimize the innovation ecosystem. Liu Shenglong and Hu Angang believe that the improvement of informatization level mainly comes from the construction of Internet infrastructure and promotes economic growth through the extensive application of information technology [2]. Wang Mengfei and Zhang Xinwei found that digital general technology is reshaping traditional production and business models, and highly collaborative production mode and innovative Internet business model are typical manifestations in the era of digital economy [3].

The relationship between digital economy and manufacturing enterprise performance needs further study [4,5]. This paper systematically studies the theoretical relationship between the digital economy and the performance of manufacturing enterprises, in order to provide certain academic insights, theoretical basis and examples for the high-quality development of manufacturing enterprises in the era of digital economy.

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2. Definition of concept and theory

2.1 Digital Economy

China mainly adopts the definition of digital economy as the G20's official definition of digital economy: digital economy refers to the use of digital knowledge and information as a key factor of production, modern information networks as an important carrier, and the effective use of information and communication technology as an important driving force for efficiency improvement and economic structure optimization.

Digital economy has a wide range of applications in various industries. For example, new retail and new manufacturing are typical representatives of the digital economy, which improves production efficiency and consumer experience through digital means. In addition, the digital economy also includes platform economy, sharing economy, Internet economy and other forms, covering all levels of digital transformation from the information and communication technology industry at the core level to the traditional industry at the broad level.

The digital economy has become a global consensus, and all countries are actively promoting its development. The Third Plenary Session of the 20th CPC Central Committee made it clear that we should improve the system for promoting the deep integration of the real economy and the digital economy, and speed up the establishment of institutions and mechanisms for promoting the development of the digital economy. Through policy support and technological progress, the digital economy will continue to promote the rapid optimal allocation of production factors and become an important driving force for economic growth. Since 2016, China's 5G, artificial intelligence and other technological innovation has continued to make breakthroughs, the construction of data factor market has accelerated, the digital economy industrial system has been continuously improved, and the total factor productivity of the digital economy has been consolidated and improved, supporting the accumulation and growth of China's new quality productivity. Digital technology can connect the originally dispersed equipment, enterprises, markets, etc., improve the innovation efficiency of enterprises, change their innovation methods and types, and expand their innovation space. It can also be deeply integrated with physical products to create disruptive innovative products, such as smart homes and smart cars.

2.2 Service-oriented manufacturing industry

In the "Implementation Opinions on Promoting the Deep Integration of Advanced Manufacturing and Modern Service Industries" released by the Chinese government website, it is mentioned that improving the level of integrated general contracting, strengthening the whole life cycle management, optimizing supply chain management, developing service-derived manufacturing and industrial cultural tourism are the key directions of the service-oriented transformation of the manufacturing industry. The policy encourages deepening the integrated development of manufacturing and service industries and the Internet, breaking through key technologies, implementing the industrial Internet innovation and development strategy, and promoting the digital transformation of key industries.

Digital technologies such as cloud computing, big data, sensors, Internet of Things, mobile Internet, artificial intelligence, etc., provide the technical foundation for manufacturing services, and promote the explosive growth of the Internet of everything and data scale. These technologies not only empower manufacturing, but also drive innovation in service-based manufacturing, enabling manufacturing companies to provide services based on data rather than just capabilities. The trend of servitization in manufacturing industry shows that enterprises no longer only focus on the production of physical products, but involve the whole life cycle of physical products, including market research, product development or improvement, production and manufacturing, sales, after-sales service, etc. The service link plays an increasingly important role in the manufacturing value chain. Many traditional manufacturing enterprises even focus on strategic management, research and development, marketing and other activities, giving up or outsourcing manufacturing activities, and manufacturing enterprises are transforming into service enterprises in a sense.

2.3 Transaction cost theory

"Transaction costs" generally refer to the costs of finding a counterparty, bargaining, and supervising the execution of a contract in order for a transaction to be concluded, which not only exist, but can sometimes be so high that a transaction cannot be concluded.

The transaction cost theory was put forward by R.H. Coase (1937), winner of Nobel Prize in economics. The transaction cost theory mainly explains the reasons for the existence of the firm and the market, as well as the interaction between them. The core point of the theory is that transaction costs are the fundamental reason for the existence of the firm and also determine the boundary of the firm. Transaction costs refer to all the costs in economic activities except production costs, including the costs of searching for trading partners, negotiating, signing contracts, and supervising execution.

Coase believes that companies need to consider two kinds of costs when conducting transactions in the market: one is the transaction cost of conducting transactions in the market, and the other is the administrative cost of organizing production within the company. When the enterprise's internal management cost is lower than the market transaction cost, the enterprise will choose to expand the scale and incorporate more production activities into the enterprise. On the contrary, when the market transaction cost is lower than the internal management cost of the enterprise, the enterprise will choose to reduce the scale and outsource some production activities to the market.

The transaction cost theory can explain the efficiency dimension well, but it is difficult to explain the complementarity, lock-in and novelty dimension well, especially the complementarity and novelty dimension basically.

In the era of digital economy, based on the relevance and network of the Internet, the sharing of data and the decreasing cost, the application of digital technology has a significant innovation and empowerment effect, which constantly changes the transaction mode, transaction scenario and transaction cost, triggering the change of external and internal transaction costs, and then affects the adjustment of the boundary of enterprises to adapt to the new external environment.

2.4 Economic theory of scope

Scope economic effect refers to the situation that the cost of providing multiple products or services at the same time is lower than the cost of producing a single product or service. Scope economy refers to the same core expertise, resulting in diversification of activities, multiple activities share a core expertise, resulting in reduced costs and increased economic efficiency of each activity. Scope economy refers to the decline in the long-term average cost of enterprises with the increase of product varieties.

The development of digital technologies such as big data, cloud computing, Internet of Things and artificial intelligence makes the production process from automation to intelligence, and realizes the visualization and sharing of the production process, so as to realize the effective connection of various departments and the full sharing of resources, and at the same time, through the real-time feedback of problems, greatly reduce the equipment downtime and reduce the product defect rate. Finally realize the stable and efficient operation of the production process and the improvement of product quality.

2.5 Value chain theory

The interrelated production and operation activities constitute a dynamic process of creating value, that is, the value chain. Porter's "value chain" theory reveals that the competition between enterprises is not only the competition of a certain link, but the competition of the whole value chain, and the comprehensive competitiveness of the whole value chain determines the competitiveness of enterprises. In Porter's words: "The consumer's perception of value consists of a series of specific activities and profits within the firm, both material and technical. When you compete with other firms, you are competing with multiple activities within the firm, not with any one activity."

In the era of digital economy, virtual value chain and digital assets provide a new field for enterprise value creation, and provide new possibilities for enterprises to rebuild competitive advantages. Today's enterprises are competing in both the real and virtual worlds, and the tangible

value chain (PVC) includes research and development, design, procurement, production, sales and final consumer support and other links and business units to add value and create value. Virtual value chain, including information collection, organization, screening, sorting, analysis and distribution.

In the era of digital economy, enterprises can realize the full integration and integrated development of each link and business unit in the tangible value chain and the virtual value chain. On the one hand, through informatization and digitalization, product assembly and manufacturing technology can be improved, production efficiency can be improved, and value added can be realized. On the other hand, intangible services provide customers with value-added and value creation services in a networked and digital way, and with the development of product digitization and digital productization, more service value is given to tangible products to realize the value increase and value creation of products.

3. Current situation analysis of manufacturing and digital economy

3.1 Current situation of manufacturing development

The overall growth of the manufacturing industry has slowed down, and the operating pressure of enterprises has increased.

Production capacity cycle: China's production capacity cycle is undergoing profound changes. Seven industries, including photovoltaic, new energy vehicles, lithium batteries, power semiconductors, construction machinery, air conditioning and steel, have overcapacity problems, and some industries have low capacity utilization, resulting in zero or negative cash profit margins.

Imbalance of supply and demand: the imbalance between supply and demand of photovoltaic and lithium battery industry is closest to reaching a turning point, and demand growth is still steady; The new energy vehicle and power semiconductor industries are far from the turning point, mainly affected by the balance sheet status and profitability.

Policy impact: Government policies have influenced the overcapacity problem to a certain extent. While policy is not the main driver, in some periods, government incentives for specific industries can lead to over-investment.

Lean digitalization: China's manufacturing industry has made remarkable progress in lean digitalization. Enterprises apply lean digitalization to increase productivity, reduce costs, and optimize resource allocation. The proportion of enterprises with intelligent manufacturing capability maturity of level 2 and above is increasing year by year, and the penetration rate of intelligent manufacturing factories is also increasing 3.

Industrial growth: Equipment manufacturing and high-tech manufacturing witnessed marked growth. The added value of equipment manufacturing accounted for 34% of all industries above designated size, and that of high-tech manufacturing increased by 9.4%.

The high-end of the manufacturing industry is growing, and the risk of bottleneck of key technologies still exists. The development level of advanced manufacturing and high-tech manufacturing not only reflects the competitiveness and development level of a country's manufacturing industry, but also has a strong penetration effect on the development of other industries, and can promote the optimization and upgrading of economic structure.

3.2 Current situation of digital economy development

The development speed and scale of digital economy are increasing, and digital economy has become the vitality of China's economic development.

Scale and growth rate: According to the data of the China Academy of Information and Communications Technology, the scale of China's digital economy will exceed 50 trillion yuan in 2023, accounting for more than 40% of GDP, ranking second in the world for many consecutive years. It is expected that by 2025, the added value of China's digital economy core industries will account for 10% of GDP.

Contribution to economic growth: In 2023, the contribution rate of China's digital economy growth to GDP growth was 66.45%, 2.76 percentage points higher than the nominal GDP growth

rate in the same period, showing the important role of digital economy in supporting the realization of stable economic growth targets.

Policy support: In 2023, The State Council issued the Overall Layout Plan for the Construction of Digital China, which clarified the overall requirements, main goals and key tasks for the construction of digital China, and introduced a series of specific measures, such as accelerating the construction of new infrastructure such as 5G networks and data centers, and promoting the deep integration of digital technologies with the real economy.

Regional development differences: The digital economy development index of the eastern region is better than the national average, and the advantages of data elements and digital application are obvious. For example, the digital economy in Guangdong, Beijing, Shanghai and other places is particularly outstanding. In addition, the development of digital economy at the city level also shows obvious regional differences, such as Beijing, Shanghai, Shenzhen, Guangzhou and other cities score high in digital industrialization.

Industry application: The digital transformation of the manufacturing industry has been further promoted, the industrial Internet covers 49 national economic categories, 5G industry applications have been integrated into 76 national economic categories, and the number of "5G+ Industrial Internet" projects has exceeded 14,000. In addition, central enterprises have established nearly 500 digital technology companies, further promoting the development of the digital industry.

To sum up, the current digital economy is developing rapidly, with significant contribution to economic growth, strong policy support, obvious regional development differences, and has been widely used in many industries and fields.

3.3 Current situation of digitization and service of manufacturing industry

At present, the digital economy has become an important part of the global economy, with digital knowledge and information as the key production factors, digital technology as the core driving force, and constantly promote the development of the economy and society in the direction of digitalization, networking and intelligence.

The state of digital manufacturing: Manufacturing is one of the important areas of digital transformation. The digital transformation has achieved remarkable results in the manufacturing industry, mainly reflected in the following aspects: production efficiency has been improved, advanced automation equipment and intelligent control systems have greatly improved production efficiency and reduced human error. For example, in automotive manufacturing plants, robot arms accurately complete welding, assembly and other work, not only faster, but also more stable quality. Resource optimization. Through the Internet of Things technology, production equipment is interconnected to share data in real time, optimize production process, and improve resource utilization. The utilization rate of R & D tools increased. The digitalization rate of key processes in the country exceeded 60%, and the utilization rate of digital R & D tools exceeded 80%, showing the deep integration of the real economy and the digital economy.

The service industry is an important part of the modern economy, and its digital transformation is also constantly advancing: platform economy has made significant contributions. Take consumer e-commerce as an example, the online retail sales in 2023 will reach 12.4 trillion yuan, accounting for 25.9% of the total retail sales of consumer goods. The value-added of the service industry accounts for a high proportion. In 2023, the value-added of the service industry will account for 54.6% of GDP and contribute more than 60% to the economic growth. Strong innovation: The service sector is fertile ground for innovation. New forms of business, such as platform economy, are constantly emerging, which have improved service efficiency and created new economic growth points.

Challenges: Digital transformation requires people with specialized skills. The problem of cost disease, the phenomenon that the service industry is difficult to reduce the cost through large-scale production due to its labor-intensive characteristics, resulting in the continuous rise of service costs. Data security and privacy protection, with the deepening of digital transformation, data security and privacy protection have become important issues.

The digital economy is developing rapidly, and both manufacturing and service industries are

actively promoting digital transformation, but they also face many challenges.

4. Impact mechanism of digital economy on manufacturing industry

4.1 Theoretical analysis framework

The digital economy includes not only the core digital sector, but also a wide range of digital activities, which is an important driving force for improving quality, efficiency and economic structure. With its high innovation, strong penetration and wide coverage, the digital economy profoundly affects the transformation and development of the real economy, industrial structure and economic structure.

The development of digital economy not only includes the development of regional digital economy, but also includes industry digital development and enterprise digital transformation, which can affect the performance of manufacturing enterprises through direct and indirect transmission mechanisms. Among them, the direct transmission mechanism mainly lies in the enabling effect of data elements, while the indirect transmission mechanism mainly drives the quality change, efficiency change and dynamic change of the manufacturing industry through the upgrading and service of the industrial structure, the service of the manufacturing industry, the technology effect and the knowledge capital effect, so as to promote the improvement of the performance of manufacturing enterprises.

4.2 Mechanism of action and its conduction at regional level

From the regional level, the development of regional digital economy is not only an important new force for the modernization of economic system and sustainable economic development, but also an important driving factor for industrial integration and development, and an important support for promoting the transformation and upgrading of China's industrial structure and the high-quality development of manufacturing industry. Through the construction of digital infrastructure, data collection capacity, transmission speed, storage scale and computing efficiency are continuously improved, and the rapid development of Internet and related services, software and information technology services at the high-end of the value chain is promoted by digital industrialization.

The development of regional digital economy can not only promote the transformation and upgrading of the industrial structure and the development of the industrial structure of the service industry, but also promote the integrated development of the service industry and the manufacturing industry, which can help the manufacturing industry more effectively play the role of technology, knowledge, channels, market demand and collaborative innovation, fully promote the flow of resource factors, improve the efficiency of resource allocation, and reduce transaction costs. Expand the market scale, enhance the core competitiveness of manufacturing enterprises, and promote the complementary advantages of regional industries and high-quality development of manufacturing.

4.3 The mechanism of action and its conduction at the industry level

The continuous development of industry digitalization and the deepening of digital applications have promoted the integrated development of the digital economy and the real economy, enabled the transformation and upgrading of traditional industries, and promoted the quality change, power change and efficiency change of the real economy. Industrial digital development promotes enterprises to move up the value chain by building efficient digital infrastructure. Industry digital development lies in the construction of digital infrastructure, from increasing network resources, improving network speed, increasing front-end data acquisition investment, to the layout of data centers, improving computing capacity, and building a "double digital world", which can effectively promote the digital and intelligent development of analysis and decision making. It significantly reduces enterprise transaction costs, improves operational efficiency, improves decision-making efficiency and quality, and promotes the high-end climb of the value chain.

The digital development of the industry promotes innovation, openness and collaboration, improves the efficiency of enterprise R&D and innovation, and enhances innovation capability. With

the integration of data, technology and industry as the core, the development of industry digitalization has promoted open collaboration and process reconstruction of innovation, exchange and sharing of knowledge and technology, and cross-border integration. By making full use of the advantages of digital platforms, enterprises can strengthen customer collaboration, shorten development time, reduce development costs, improve development quality, accelerate enterprise technology update, enhance enterprise innovation capability, and enhance enterprise innovation momentum.

4.4 The mechanism of action and its transmission at the enterprise level

From the enterprise level, the application of digital technology is the technical basis of enterprise digital transformation, the starting point of enterprise digital transformation, and the fundamental driving force to promote the improvement of enterprise performance. Digital transformation takes digital information system, intelligent manufacturing and Internet business model as its basic characteristics. On the one hand, through the integration of information system and digital technology, it fully integrates traditional information resources, breaks information isolation, realizes information interconnection and collaboration, and strengthens internal and external cooperation and collaboration. Promote the company's management and operation efficiency and service transformation; On the other hand, intelligent manufacturing enables the manufacturing system to penetrate the whole process of research and development, production, sales, management and after-sales service, reshape the enterprise organization management and production and operation mode, promote the development of new models such as lean, flexible, personalized and diversified enterprises, reduce costs, improve efficiency, improve quality level, and enhance development momentum; In addition, the extensive application and innovative development of Internet business models enhance the connection, interaction, collaboration and expansion of supply and demand, reduce transaction costs, improve the efficiency of supply and demand matching, expand the scope of services, improve the service ability of manufacturing enterprises, promote the extension of enterprise value chain service, and enhance the ability of enterprise value creation and value addition.

5. Analysis on the mechanism of digital economy affecting manufacturing industry

5.1 The mechanism of direct influence on industrial structure

The development of the digital economy is accompanied by the innovative development of new digital underlying technologies such as artificial intelligence, blockchain, 5G, cloud computing, big data and the Internet of Things, which promotes the development of digital platforms and helps various industries to continuously break the restrictions of time and space. The direct impact mechanism of the digital economy is the direct empowerment of data elements, effectively reducing transaction costs, promoting the flow of products and factors, and expanding the size of the product market.

Directly promote the upgrading of industrial structure and service-oriented development from three aspects. First, digital industrialization improves the level of service industry. Digital industrialization promotes the development of new business models for the digital industry, and cultivates emerging digital industries based on digital technology innovations such as information and communication technology, big data, cloud computing and artificial intelligence, thereby improving the level of the service industry. Second, industrial digitalization drives the integrated development of industries. Industrial digitalization can be deeply integrated with the first, second and third industries, which not only improves the mechanization, informatization and digitalization of the primary industry, but also enhances the industrial links, consumption links and intelligent lean manufacturing of the secondary industry, but also breaks the time and space restrictions of the tertiary industry services, promotes the division of labor and cooperation development of the service industry, and enricfies the diversification and customization of the tertiary industry. Third, the digital economy has changed the market supply and demand structure. Under the background of digital economy, consumers are more willing to accept intelligent products and digital services. Digital

technology promotes the rapid and effective dissemination of entertainment and culture related services, greatly reduces the marginal service cost, and realizes the possibility of remote services, such as the high-quality and rapid development of online concerts, online education and air classes, and realizes the scale effect of the service industry.

5.2 The indirect mechanism of industrial structure

The digital economy indirectly affects the development of the manufacturing industry through a variety of mechanisms, including promoting industrial integration, promoting technological progress, promoting transformation and upgrading, influencing market structure and enterprise decision-making, reducing enterprise costs, improving sales competitiveness and affecting manufacturing agglomeration.

The digital economy stabilizes the proportion of manufacturing by promoting the integration of manufacturing and service industries. In the early stages of the development of the digital economy, this integration helps to enhance the innovation capacity of the manufacturing industry, thus stabilizing the proportion of the manufacturing industry.

By changing the subjective and objective conditions of labor, the digital economy improves the quality and skills of laborers, expands the boundaries and functions of means of production, promotes technological progress of enterprises, improves production capacity, promotes technological progress. In addition, the development of the digital economy makes the various stages of the enterprise capital cycle more smooth, accelerates the capital cycle of manufacturing enterprises, and improves the production efficiency of enterprises.

By promoting the transformation of traditional manufacturing to advanced manufacturing, the digital economy gives birth to emerging industries and models, expands the division of labor boundaries of the manufacturing industry chain, reshapes the global value chain, accelerates the transformation and upgrading of the manufacturing industry, and improves the development quality of manufacturing enterprises.

The development of digital economy has changed the market structure and affected the production and operation decisions of enterprises. In a highly competitive market, companies need to invest more in research and development to remain competitive. Policies and systems such as government intervention, laws and regulations can also significantly affect the technological innovation and management lean of enterprises.

The application of digital technology can reduce the decision cost, production cost, management cost and sales cost of enterprises. Through intelligent management systems and e-commerce platforms, enterprises can monitor all aspects of the production chain in real time, optimize resource allocation, and reduce costs.

Enhancing sales competitiveness: The digital economy, through efficient online communication platforms and e-commerce platforms, has enhanced the innovation level of manufacturing products and the ability to provide personalized services, and enhanced the competitive advantage of enterprises in the market.

The development of digital economy strengthens the manufacturing industry agglomeration by expanding market potential and external economy, which plays an important role in promoting regional innovation level and high-quality economic development.

5.3 The effect and mechanism on manufacturing industry

Digital economy promotes the upgrading of the industrial structure of the manufacturing industry. In the process of digital transformation and upgrading, the industrial structure of the manufacturing industry has changed from relying on low-skilled labor to high-skilled labor, and from resource-dependent to knowledge and technology-intensive. The application of digital technology has promoted product innovation and technological innovation, and traditional low-skilled manual labor has been replaced by more advanced and efficient industrial automation and intelligent solutions. At the same time, the market innovation of the digital economy has driven the development of high-tech industries such as the information and communication industry, equipment manufacturing industry, and new materials, and has increased the proportion of knowledge and technology-intensive

manufacturing in the entire manufacturing industry.

Digital economy has promoted the service-oriented transformation of manufacturing industry. In the era of digital economy, manufacturing enterprises can accurately match customer needs through the application of information technology such as the Internet of Things, mobile Internet, and big data to achieve the long tail effect of the product market. Some leading manufacturing enterprises are gradually turning to service-oriented manufacturing, and professional third-party network service platforms are also gradually emerging.

The digital economy has reduced the cost of manufacturing and increased transaction efficiency. In the digital economy, the Internet and information systems have become the new infrastructure, and big data has become a key factor of production. The rapid development and innovation of the digital economy has reduced manufacturing costs, including customer investigation costs, transaction costs, etc., and improved transaction efficiency.

The digital economy has the characteristics of high innovation, strong penetration and wide coverage, which constantly changes traditional industries, especially the emergence of new business forms such as new e-commerce models, new platforms and digital marketing, and further enables the development of manufacturing. On the one hand, through the digital platform and technology to achieve effective sharing of resources, reduce the idle rate of equipment, plant and logistics resources, improve the efficiency of resource allocation, so as to achieve cost reduction and efficiency increase in production, logistics and other links.

The development of regional digital economy has given birth to new business forms, new models and new products, and digital technology has significantly brought convenience of consumption and promoted the demand for new products and new services, which is constantly reshaping and changing the existing demand structure and promoting the upgrading and service of industrial structure. The development of regional digital economy promotes the service of industrial structure, promotes industrial integration, and promotes the high-quality development of manufacturing industry.

6. Countermeasures and suggestions

6.1 We will leverage the role of spatial connectivity in the digital economy

We will give full play to the spatial connectivity and empowerment of the digital economy, unleash the dividends of the digital economy in industrial transformation and upgrading, and promote the integrated development of the manufacturing and service industries. First, we need to strengthen digital infrastructure. All localities should strengthen the construction of digital infrastructure, fully release the dividends of digital technology, and promote high-grade and service-oriented development of industrial structure. Second, formulate a scientific industrial policy. Formulate scientific industrial policies for the development of the digital economy, promote digital industrialization and industrial digitalization, promote the integrated development of manufacturing and service industries, and promote the manufacturing industry to climb up the value chain.

We will improve regional industrial policies for the digital economy. In the era of digital economy, the government should pay attention to the positive spatial spillover effect of the development of digital economy on the service of industrial structure, improve the industrial policy of regional digital economy development, promote the balanced development of regional digital economy, build a digital platform for regional industrial cooperation, promote the integrated development of manufacturing and service industries, and achieve high-quality development of manufacturing industry.

6.2 Take the industry digital development as a new opportunity

Virtue should be a common element in all education. It is indecent and inhumane to try to achieve any temporary prosperity by sacrificing ecology. Ecology is seen as a symbol of morality, equivalent to purity, immaculate, and integrity. Cleanliness reflects a person's respect and care for himself and others, and it also helps to create an orderly, harmonious and beautiful social environment that

provides beneficial conditions for people's spiritual and moral growth.

Honesty is the best human virtue. The widespread popularity of business consciousness makes the conflicts of interest between individuals become frequent. The realization of altruistic moral concerns is impeded. Teachers must get children used to accurately stating facts, which is both in keeping with the principle of honor and a linguistic achievement. Let the children speak in the closest way to the truth, state the truth without concealing or exaggerating it, use words accurately, make truth the test of perfect language, give words a strong moral purpose, and then integrate this accuracy into all thinking and observing activities in order to think things as truly as possible, to see things truly from the bottom of their hearts.

The education of virtue should be the main object and mission of education, the aim of which is to equip students with the ability to perform their duties and to carry out the daily work of life in the healthiest, happiest and most complete manner. By raising the status of virtue to an ideal level, people's lives can be restored to a healthy state. However, this recovery will be impossible if education continues to be promoted as the only path to success.

Education is for the pursuit of an ideal state of existence. Education should enable individuals to understand their environment, including what the world looks like, what it is made of, and what it can do for people. Education should help individuals define what they are best suited to do, including understanding social conditions and needs, their place in society, and the best ways to achieve and spread happiness.

6.3 Enhance the driving role of digitalization in manufacturing services

We will accelerate the innovation and application of digital basic technologies such as big data, cloud computing, blockchain, data management, digital networks, and cloud platforms, promote integrated innovation and digitalization in all sectors of the manufacturing industry, build and improve advanced digital information system infrastructure, enhance internal and external connectivity, and effectively improve the service level of the manufacturing industry.

We will accelerate the construction and development of intelligent manufacturing. Strengthen the transformation and construction of enterprise smart factories, change the traditional process flow, production management, supply chain and other links, realize intelligent network connection, intelligent management, intelligent logistics, intelligent manufacturing and other intelligent elements, so as to make the manufacturing industry flexible, intelligent, lean, and service-oriented. In the "Internet +" era, the digital transformation of manufacturing enterprises should not only focus on the realization of the digital manufacturing process, but also reconstruct the enterprise value chain and business form model with Internet thinking, and through the digital systematic innovation model, focus on enterprise manufacturing and products themselves, to meet the needs of customers specific, personalized and high quality. It is also necessary to strengthen the upgrading of manufacturing quality and the creation of customer demand, achieve manufacturing value-added and product value increase, and enhance the competitiveness and viability of enterprises.

6.4 We will give full play to the important role of talent and innovation

Focus on personnel training and knowledge capital accumulation. Enterprises make full use of the effective sharing and efficient connection in the era of digital economy, promote the cultivation of human capital and the optimization of structure, give full play to the value of employees' knowledge, continuously stimulate employees' creative ability, promote the digital transformation of enterprises, empower the development of enterprises, and improve corporate performance.

Building a digital innovation ecosystem. Manufacturing enterprises can reconstruct the innovation ecosystem through digital transformation, improve innovation efficiency, increase innovation results, and realize the transformation of enterprise value increase from manufacturing value-added to creating value-added.

Formulate scientific and reasonable enterprise strategic objectives under the digital background. The effect of digital transformation is also subject to the strategic objectives of enterprises. Based on long-term sustainable development, strategic objectives should be formulated comprehensively and scientifically to promote the realization of efficient, coordinated and long-term digital transformation

paths, enhance the long-term empowering role of digital transformation, promote the effective improvement of the overall competitiveness of manufacturing enterprises, and achieve high-quality long-term development of manufacturing industry.

7. Conclusion

The development of regional digital economy can improve the performance of manufacturing enterprises. The development of regional digital economy can promote technological progress and the optimization of human capital structure, promote the high-grade and service-oriented development of the regional industrial structure, and improve the net profit of manufacturing enterprises.

Industry digital development can improve the performance of manufacturing enterprises, positively regulate innovation ability and total factor productivity, enhance the credit and financing ability of enterprises, expand fixed asset investment and production scale, improve the service performance of manufacturing industry, and promote green transformation and sustainable development.

The digital transformation of manufacturing enterprises can significantly improve the performance of enterprises, promote the development of embedded service in manufacturing industry, and promote the growth of short-term net profit margin and the improvement of long-term net return on assets.

The digital transformation of state-owned manufacturing enterprises can promote the improvement of long-term performance more effectively, while non-state-owned manufacturing enterprises are more inclined to improve short-term performance quickly.

We must actively implement the strategic requirements of the CPC Central Committee and The State Council to promote the integrated development of the digital economy and the real economy, optimize the institutional mechanisms for the development of the digital economy, take the manufacturing industry as the main battlefield and main track for the development of the digital economy, and fully release the potential of the digital economy to drive the high-quality development of the manufacturing industry.

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