

# Research on the path of high-quality development of manufacturing industry empowered by digital economy

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**Abstract:** Driven by the digital economy, the development of manufacturing industry has undergone five changes. Input has shifted from factor driven to data driven, output from product centered to user experience centered, industry connection from industry association to enterprise community, industrial ecology from competition and cooperation to mutual benefit and win-win, management structure from hierarchical structure to grid organization. Based on this environment, researchers in the field of manufacturing need to explore the practical path of high-quality development of manufacturing industry under the support of digital economy, and finally give full play to the enabling value of digital economy.

**Keywords:** Digital Economy; Manufacturing Industry; High-quality Development; Path Study

## 1. Introduction

With the continuous development of science and technology, the digital economy promotes the scientific and technological revolution and industrial upgrading, and gradually becomes an important reverse of the development of the current modern economic system. In the report of the 20th National Congress of the Communist Party of China, it is clearly pointed out that “accelerate the development of digital economy and promote the deep integration of digital economy and real economy”. Based on this, in order to promote the high-quality development of China’s manufacturing industry in the new period, it must grasp the opportunity and window in the development of science and technology in a new round, and then grasp the key nodes, seize the core links, promote the digital transformation of the manufacturing industry. Then it must constantly stimulate the development potential of the digital economy, and give full play to the advantages of the digital economy for the development of manufacturing industry. In view of this, this paper combined with the existing research results, on the basis of analyzing the high-quality development mode and internal mechanism of the digital economy enabling manufacturing industry, proposed the dilemma of enabling the high-quality development of manufacturing industry, and finally proposed the specific development path, which is important to promote the high-quality development of China’s manufacturing industry.

## 2. The mode or internal mechanism of high-quality development of digital economy enabling manufacturing industry

### 2.1 Ways of enabling manufacturing

First, platform enabling. The digital economy will give full play to its platform role to promote the high-quality development of China’s manufacturing industry. First, consumers can interact directly with production enterprises through the network, so as to achieve a dynamic match between supply and demand and improve the supply level of production enterprises. The second is to use the Internet platform and other emerging scientific and technological means to improve knowledge and skills, better match outstanding talents, and then improve the job satisfaction and productivity of enterprises. The third is to use the Internet financial platform to help small and medium-sized enterprises to solve the problem of financing difficulties, but also a financing method of resource empowerment. The fourth is to use the information platform to improve the internal information flow efficiency of manufacturing enterprises and reduce production costs.

Second, network empowerment. Network empowerment in the digital economy refers to the network effect generated by Internet empowerment in the high-quality development of manufacturing. The first is the amplification effect, that is, by producing a strong scale effect on manufacturing enterprises, their income scale continues to grow. The second is the reduction effect, which is manifested in the digital network, the application of the Internet of things and the optimization of the management process, so as to reduce costs. The third is the dandelion effect, which speeds up the exhibition of upstream and downstream industries in the industrial chain.

### 2.2 Internal mechanism

First, economies of scale. The application of the new generation of information technologies, such as 5G, big data and blockchain, can fully release the digital dividend, promote data sharing and eliminate information asymmetry. In addition, it can also enable traditional manufacturing enterprises to reduce the cost of information acquisition and shorten the time of information transmission, so that they can instantly obtain the latest industry information and other information, which can enhance the value of goods. And promote the high-quality development of China’s manufacturing industry. Based on this, with the help of the digital economy, enterprises can reduce production costs, gain more profits, and ultimately improve the efficiency of procurement, design, production and sales.

Second, economy of scope effect. Digital economy can narrow the distance between producers and consumers, so that manufacturers can provide more goods and services to meet the needs and expectations of customers, so as to enhance customer satisfaction and loyalty. Through the accurate judgment of data, users can be provided with personalized and personalized goods and services, and the scale economy of the digital economy can be improved. The use of big data can improve the accuracy of information obtained by manufacturing enterprises, promote the “precise” production of manufacturing enterprises, and achieve an accurate match between supply and demand through optimal

resource allocation.

Third, the effect of technological innovation. The development of the digital economy has created opportunities for the deep integration of core technologies and the real economy, and the elements of scientific and technological innovation represented by the digital economy have become the core driving force of new development drivers. Informatization has become an important platform and hub for the integrated development of industries. The development of technology has promoted the transformation and upgrading of enterprises, and with the support of technology, enterprises can accelerate the digital transformation on the whole. Product research and development, design, manufacturing, sales, after-sales and other links can be fully upgraded through the accurate analysis and prediction of digital technology, thus greatly improving production efficiency and economic benefits.

### **3. The practical dilemma of digital economy enabling high-quality development of manufacturing industry**

#### **3.1 Lack of digital infrastructure**

First, it lacks key technologies. At present, China's mastery level of digital core technologies is still very low, and there is still a big gap with the world's advanced level, which has caused a great hindrance to the high-quality development of manufacturing enterprises. Second, the investment is not strong. At present, the level and proportion of China's investment in digital infrastructure is not high, which is difficult to meet the actual demand. Due to the consideration of risks and benefits, investment institutions are reluctant to participate in digital infrastructure, resulting in a huge funding gap. Third, regional imbalances. Economically advanced regions take the lead in innovation and technology and have complete digital infrastructure. Especially in economically backward regions, their industrial structure is not perfect and their infrastructure is not advanced, which makes digital infrastructure relatively weak.

#### **3.2 Insufficient data sharing and integration**

First, the lack of data sharing concept, most manufacturing enterprises pay more attention to internal data, and the degree of data openness and sharing between other enterprises is low, and there is still the phenomenon of information island. Second, there is a lack of unified standards. The manufacturing field is diverse in sub-industries, the industry gap is large, and the types of equipment are diverse, so the data formats used by different enterprises are also different, and the unified data standards of the industry have not been established, making it difficult to integrate and utilize dispersed data and transform research. Third, the lack of supervision and management. Industrial data is complex and diverse, including research and development, technology, procurement, equipment, manufacturing and users and other dimensions, and in the process of data sharing and integration, it is easy to leak or tamper, which ultimately brings hidden risks to enterprises.

#### **3.3 Lack of high-quality skilled personnel**

First of all, based on past experience, we can know that there are various drawbacks in China's talent cultivation mode, which leads to a shortage of highly skilled personnel. Secondly, the traditional manufacturing industry is not attractive, the salary is not competitive, and more talents are flowing to the economically developed places, which leads to the imbalance of the geographical distribution of talents. Finally, with the rapid development of digital industry, a large number of high-end talents have been introduced, resulting in a large loss of talents in traditional enterprises. Moreover, the government and enterprises have not established a talent guarantee mechanism, which leads to the lack of high-quality compound talents in manufacturing enterprises.

#### **3.4 There is great resistance to enterprise transformation**

First, some entrepreneurs have a wrong understanding of digital technology. They only use digital technology as an auxiliary tool for production and operation, and do not explore and use their own data assets. In addition, the foundation of enterprise transformation is weak, and the shortage of digital innovation talents ultimately makes enterprises lack of transformation motivation. Second, at present, the cost of introducing digital technologies such as cloud computing and big data is still very high, which increases the conversion cost of enterprises. In addition, since process innovation often destroys the stability of existing equipment, it is difficult to strike a balance between the two, and there are many doubts about introducing this new model.

### **4. The digital economy enables the high-quality development of manufacturing**

#### **4.1 Layout of information infrastructure**

The new generation of information infrastructure is an important pillar to promote the deep integration of digital technology and the economy, a new opportunity for the transformation and upgrading of traditional manufacturing enterprises, and a breakthrough point for the country to catch up in science and technology. In the process of this infrastructure construction, it is necessary to strengthen the top-level design of new infrastructure construction, formulate corresponding supporting policies, and provide a favorable policy environment for new infrastructure construction. First of all, it is necessary to combine the regional development characteristics of each region, carry out the regional layout of new infrastructure, and put forward targeted near, medium and long-term development strategies. Secondly, the construction of new infrastructure needs more special policy fund support, broaden the fields of support projects, and increase the intensity of support. Finally, broaden the financing channels for new infrastructure construction and formulate corresponding preferential tax policies to attract more social capital to invest in new infrastructure construction and fully mobilize the enthusiasm of market players.

#### **4.2 Give play to the role of data factors**

First, establish an industrial data integration and sharing platform. The country should speed up the establishment of a national-

level industrial data integration and sharing platform integrating research and development, production and operation. On the one hand, government departments should lead the establishment of an industrial data integration and sharing platform, increase capital investment, and strive to build an industrial data platform with cross-industry and cross-link high-speed transmission, extensive coverage and high-quality service, so as to realize data interconnection, prevent repeated construction, and provide strong support for the digital transformation of the manufacturing industry. On the other hand, manufacturing enterprises should break the dilemma of information silos, take the initiative to realize data sharing in various business links, and participate in the construction of data platforms, so as to release data value and promote scientific and technological innovation. Second, improve data norms and safety supervision mechanisms. Establishing a sound data specification and security management system is the key for manufacturing enterprises to realize data capitalization and exert its value. Among them, it is not only necessary to speed up the establishment of authoritative data standards, break down data barriers, realize cross-industry and cross-enterprise data sharing, but also accelerate the establishment of multi-layer data security supervision system.

#### 4.3 Strengthening the training of digital talents

First, we will bring in cutting-edge digital talents. First, the government should formulate preferential policies. Among them, high-quality resources will be provided in such areas as household registration, employment of children and talent subsidies to create a suitable environment to attract high-end talents in the digital economy. In addition, the talent introduction mechanism will be further improved by establishing a digital talent evaluation mechanism and formulating welfare subsidy policies. Second, we should broaden the channels of talent introduction and pay attention to post coordination when introducing digital talents. Enterprises should adjust the salary system according to their own business conditions, establish reward and punishment mechanisms, or improve the salary treatment of digital talents through equity incentives. Second, cultivate multi-disciplinary digital talents. First, it is necessary to focus on the frontier and key areas of digitalization. In the context of digital economy, higher vocational colleges should actively carry out the work of integrating industry and learning, offering digital economy majors and related courses, promoting the deep collaboration among industry, learning and research, and providing support for scientific and technological talents with digital innovation ability. Second, with the help of market training organizations, accelerate the transformation of digital professionals to the manufacturing industry, and cultivate composite digital talents with both digital and manufacturing capabilities. Third, it is necessary to improve the staff training mechanism and strengthen the training of composite digital talents through job rotation, competition and digital skills training.

#### 4.4 Clarify the direction of enterprise transformation

On the one hand, formulate the transformation strategy according to the characteristics of the enterprise. In combination with the enabling effectiveness of digital economy, it can be seen that the enabling situation has the feature of intensive heterogeneity of industry factors. Based on this feature, enterprises can formulate transformation strategies according to their own development trends and characteristics, so as to enhance their competitive strength. Labor-intensive manufacturing enterprises should vigorously introduce digital technology and rely on data technology to improve the professional skills and comprehensive quality of employees. In addition, such enterprises need to rationally layout, appropriately improve the flexible productivity and intelligent manufacturing power, so as to optimize the allocation of resources, promote the effective integration of digital technology and manufacturing technology, and ultimately promote the long-term development of enterprises.

On the other hand, actively build a digital transformation practice scenario. Due to the short development time of the domestic digital economy, the manufacturing industry has problems such as a long transformation cycle and poor transformation effect in the process of transformation, which is easy to discourage the enthusiasm of enterprises. To this end, the government can promote the digital transformation of universities and enterprises through demonstration methods, and can build transformation demonstration scenes, publicize successful cases, and ultimately cultivate excellent digital talents and industry benchmark enterprises. In addition, enterprises should actively explore new paths and ways of digital transformation, declare transformation pilots, and share transformation experience.

## 5. Concluding comments

All in all, under the development perspective of the digital era, the manufacturing industry should rely on the digital economy to achieve industrial upgrading and transformation by laying out information infrastructure, giving play to the role of data elements, strengthening the training of digital talents, clarifying the direction of enterprise transformation and other measures, and finally give full play to the enabling value of the digital economy.

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