

# *Analysis of Digital Economy Promoting High Quality Development of Manufacturing Industry*

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**Keywords:** Digital economy; Manufacturing industry; High quality development

**Abstract:** China's manufacturing industry faces a number of problems such as weak digital infrastructure, weak industrial innovation capability, insufficient digital productivity and poor industry chain synergy. The digital economy promotes the high-quality development of the manufacturing industry in four aspects: enhancing the innovation ability of the manufacturing industry, improving the production efficiency of the manufacturing industry, reducing the operating costs of the manufacturing industry and improving the sales level of the manufacturing industry. From the above logical mechanism of digital economy empowering the high-quality development of manufacturing industry, it is suggested that countermeasures should be taken to strengthen infrastructure construction, build a technological innovation platform, play the role of enterprise leadership, and strengthen data opening and sharing.

## 1. Introduction

Science and technology have experienced rapid development since the beginning of this century, and new products, services and business models are constantly emerging. Digital technology has fully penetrated into all aspects of society and plays a crucial role in economic development. Digital economy is a new economic form, mainly based on data as the production factors, digital infrastructure as the underlying support, big data, cloud computing, Internet of Things and other digital technologies as the core, and ultimately realize the improvement of industrial efficiency and optimization of industrial structure[1-4]. The digital economy has the following main connotations: first, the core of the development of the digital economy lies in the degree of integration of digital technology, and the complexity of economic activities highlights the importance of digital technology. The second is that the overall economic operation efficiency is improved through the application of digital technology, and at the same time, the digital economy also penetrates all aspects of society and brings new business models. Third, data has become a new key factor of production, capable of optimizing the ratio of various factors of production inputs, increasing the productivity of various factors of production, and becoming an important means and role in promoting high-quality economic development. The digital economy has not only become the leading force in economic development, but also empowered the digital transformation of the manufacturing industry through deep integration with the real economy, becoming a new engine

and new momentum for economic recovery and development. In order to give full play to the advantages of the digital economy, countries have introduced a series of development strategies, China has repeatedly written the digital economy into the government work report. In the current "14th Five-Year Plan" and the outline of the 2035 vision, the digital economy will also be described separately. With the rapid development of new technologies, coupled with the far-reaching impact of the epidemic on the global economy, the digital economy has become a new economic growth point [5-7].

Manufacturing, as an important component of industry, has a significant impact on GDP growth, and China is promoting the high-quality development of manufacturing through the development of the digital economy. In order to achieve the goal of building a strong manufacturing country, China introduced "Made in China 2025" and its implementation, leading the manufacturing industry to refinement, high synergy direction, promote modern information technology and market, design, production, after-sales and other aspects of the close integration, and to promote automation, intelligent, flexible production line construction completed. The twentieth report even pointed out that "high-quality development is the primary task of building a comprehensive socialist modernization country". High-quality development of the manufacturing industry is the top priority of high-quality economic development. Manufacturing industry as the pillar industry of economic high-quality development, the level of manufacturing capacity to improve is among the important guarantee of manufacturing power. China's manufacturing industry still exists in the lack of independent innovation ability, "neck", industrial chain supply chain "supply" and other industries. Therefore, grasping the opportunity of the era of digital economy development and empowering the manufacturing industry through the digital economy is the inevitable choice for high-quality development. Under the environment of digital economy, data as a new factor of production has changed the marginal diminishing effect of traditional factors of production, and the production mode has also changed. How to perfectly integrate the digital economy and manufacturing industry to deeply empower the high-quality development of manufacturing industry has triggered in-depth thinking.

## **2. Current Development Situation of China's Manufacturing Industry and the Innovation Dilemma it Faces**

High-quality development of the manufacturing industry has several main connotations: First, the quality of manufacturing products should be continuously improved, the quality of the product directly affects the reliability of the product, safety, life cycle, etc., only the quality of the product is improved, in order to promote the sustainable and sound development of the market; Second, the technical level and innovation capacity of the manufacturing industry should be continuously improved, the technical level of the product directly determines the occupancy of the product, the innovation capacity directly determines the future development prospects of the product; Third, the product production efficiency of the manufacturing industry should be continuously improved. Innovation ability directly determines the future development prospects of the product; Third, the manufacturing industry should continue to improve the production efficiency of the product. Enhancement of production efficiency, directly leading to a substantial increase in supply capacity, can reduce product prices, so that the product has a strong market competitiveness, and bring sufficient economic benefits; four is the manufacturing industry products to meet the concept of green environmental protection. In the current environment of low-carbon and harmonious development of man and nature, the production process must be energy-saving and not pollute the environment to ensure the harmonious development of man and nature.

The integration of the digital economy and manufacturing industry, combined with the essential

characteristics of the digital economy, in-depth analysis of the digital economy empowers the logical mechanism of the high-quality development of the manufacturing industry for the enhancement of the manufacturing industry's innovation capacity, improve the manufacturing industry's production efficiency, reduce the manufacturing industry's operating costs and enhance the manufacturing industry's sales level.

#### (1) Weaknesses in digital infrastructure

In recent years, China's manufacturing industry faces several problems such as weak digital infrastructure, weak industrial innovation capability, insufficient digital productivity and poor industry chain synergy, which leads to an overall lack of vitality in the manufacturing industry and an urgent need for transformation in development. In the era of digital economy, data is the key element, and digital infrastructure for collecting data is the basic condition [8]. The digital infrastructure can realize the collection, transmission and processing of data through the Internet of Things, big data, 5G and other digital technologies. Manufacturing enterprises have problems such as lack of big data platform and industrial internet platform has not been established, on the one hand, manufacturing enterprises are unable to collect and mine effective data through the internet, and it is difficult to accurately obtain the user's demand preferences. On the other hand, manufacturing enterprises are unable to centralize their advantages, making it difficult to efficiently connect all links in the industrial chain and greatly reducing production efficiency.

#### (2) Lack of industrial innovation capacity

Under the wave of digital economy, the integration of digital technology into manufacturing industry has become a new opportunity for high-quality development. The digital economy empowers the manufacturing industry through digital technology, and helps the manufacturing industry's key core technologies to be independently controllable, so as to enhance the manufacturing industry's innovation ability. However, some manufacturing enterprises lack digital talents, the level of digital technology application is still relatively low, the use of digital technology only stays in the imitation copying stage, unable to give full play to the advantages of digital technology. In addition, the digital innovation system has not been universally applied, and there is an obvious disconnect between the digital R&D innovation platform and the manufacturing industry in the application of digital technology. The "industry-university-research" results have not yet been fully realized, and it is not enough to improve the overall innovation capabilities of the industry through digital technology.

#### (3) Lack of digital productivity

The development of manufacturing enterprises has experienced three stages of automation, digitalization and intelligence, and at present many manufacturing enterprises have realized automation on a large scale, but there is still a big gap from intelligence. Due to insufficient capital investment and limited technology and talent, part of the manufacturing companies have not truly used digital technology to participate in the digital economy trend. Production methods such as intelligent manufacturing and flexible personalized customization have not been fully realized, and digital productivity is insufficient.

#### (4) Poor industry chain synergy

The digital transformation of the industrial chain is crucial to the high-quality development of the manufacturing industry, and the sharing of data between upstream and downstream manufacturing enterprises can eliminate "information silos". On the one hand, due to the lack of data sharing platform, manufacturing enterprises are difficult to integrate key internal data resources through digital technology. On the other hand, the synergy between the upstream and downstream of the industrial chain is not high, there are technical barriers between upstream and downstream manufacturing enterprises, and there is a lack of information exchange and sharing mechanism between manufacturing enterprises, which makes it impossible to realize collaborative

manufacturing of the industrial chain.

### **3. Logical Mechanism of Digital Economy Enabling High-Quality Development of Manufacturing Industry**

Integration of digital economy and manufacturing industry, combined with the essential characteristics of the digital economy, in-depth analysis of the logic mechanism of the digital economy empowers the high-quality development of the manufacturing industry for the enhancement of the manufacturing industry's innovation ability, improve the manufacturing industry's production efficiency, reduce the manufacturing industry's operating costs and enhance the manufacturing industry's sales level.

#### **(1) Digital economy enhances manufacturing innovation**

The rapid development of digital technology has accelerated the pace of penetration of the digital economy into the manufacturing industry, broken the original manufacturing enterprise boundaries, and reconstructed the innovation ability system of manufacturing enterprises. The innovation of the digital economy is mainly manifested through the application of digital technology, through cloud computing, big data, computer-aided design and other digital technologies have become a tool to carry out product innovation, so that the product research and development and innovation ability is enhanced, accelerating the renewal of the product iteration, and better meet the needs of users. First, the enterprise integrates user requirements through the Internet platform, which makes the transmission of user requirements more rapid and accurate. Then, the enterprise will collect the user requirements and R & D design department docking, invite users to participate in the experience, according to the user feedback repeatedly for modification. By putting user requirements directly into the process of R&D and design, the innovation ability of the enterprise is effectively enhanced.

#### **(2) Digital economy improves manufacturing productivity**

Data as a key resource element in the digital economy era, combined with capital, labor, production equipment and other factors, can significantly improve manufacturing production efficiency. First of all, the use of digital technology can optimize the production management, internal operation and marketing management within the enterprise, which makes the labor force greatly reduced and reduces the labor cost; at the same time, the digital technology can also make the accurate calculation between the various factors of production, reducing the impact of the traditional diminishing margins of the factors of production. The deep integration of digital technology and the manufacturing process can make the production of enterprises more intelligent, personalized and convenient. Among them, intelligence can realize collaborative production and manufacturing, personalization can realize customized services for different users' needs, and convenience can realize real-time mastery of product operation.

#### **(3) Digital economy reduces operating costs in the manufacturing sector**

In the traditional manufacturing industry, the operation of all aspects of enterprise production and manufacturing is inefficient and incurs high costs. With the wide application of digital technology, the cost problems in decision-making and management have been solved and the operational efficiency of enterprises has been improved. Among other things, the application of digital technology can make the information of all aspects of enterprise operation accurate, improve the industrialization of enterprises through data mining, data analysis and other technologies, and greatly reduce the decision-making costs of enterprises. In terms of management costs, the application of digital technology can make the management level reduce and make the management more flat. In the face of the fierce changes in market competition, reflect more quickly and position more accurately.

#### **(4) Digital economy to boost manufacturing sales**

The digital economy enhances the sales level of the manufacturing industry by expanding sales channels and improving after-sales service. In terms of sales channels, the industrial Internet provides a broader sales platform, and through the effective integration of massive data resources, it can dig deeper into user needs and precisely implement policies. In terms of improving the level of after-sales service, it is possible to collect data on the consumer's sense of experience, product information feedback data, and constantly update and iterate the product. You can also use the data analysis function to accurately locate and quickly reflect product failures, forming positive feedback on consumer satisfaction. Through high-quality sales channels and after-sales service, the overall sales level is improved.

#### **4. Countermeasures and Suggestions on Digital Economy Enabling High-Quality Development of Manufacturing Industry**

Guided by the existing problems in the high-quality development of the manufacturing industry empowered by the digital economy, it puts forward countermeasures and suggestions such as strengthening infrastructure construction, building a technological innovation platform, playing the leading role of enterprises and strengthening data openness and sharing, etc., which will help the high-quality development of the manufacturing industry empowered by the digital economy.

##### **(1) Enhancing infrastructure development**

In the era of the digital economy, data has become a key element of production, and access to and use of data need to be based on digital infrastructure. Complete digital infrastructure is a prerequisite for the realization of digital economy. First, the construction of 5G base stations and network broadband should be established, especially to guarantee the coverage of digital infrastructure in key parks. Secondly, the construction of industrial Internet platforms and data centers provides a resource management platform for information collection and data processing of manufacturing enterprises, which is a good promotion for the development of the manufacturing industry.

##### **(2) Creating a platform for technological innovation**

Manufacturing enterprises need to build a technology innovation platform mainly contains: First, the research and development platform, the research and development platform mainly and some universities and research institutes to cooperate, for digital technology to provide technical support. Second, the results of the transformation platform, forwarding platform mainly for digital technology advanced results to provide a platform for transformation, to promote the iteration of manufacturing products. Third, the talent service platform, through the cultivation of local talents, the introduction of professional talents, to achieve resource sharing, to provide talent support for the manufacturing industry.

##### **(3) Taking the lead in business**

To achieve high-quality development of the manufacturing industry, it is necessary to give full play to the leading role of enterprises. It is necessary to actively encourage leading manufacturing enterprises to vigorously introduce digital technology, form advanced demonstration sites for digitalization, and drive manufacturing enterprises in the cluster to realize digital transformation. Enterprises should strengthen exchanges to realize the implementation of digital technology achievements and improve the overall digitalization level of other related enterprises in the industry chain. It is vital to encourage manufacturing enterprises to carry out industrial layout and support manufacturing enterprises to carry out transformation.

##### **(4) Enhancing open sharing of data**

The establishment of an open data sharing mechanism is a necessary way to realize the high-quality development of the manufacturing industry. On the one hand, it is necessary to establish

standardized data interfaces so that the data of each link in the industrial chain can be interconnected, eliminating "information islands". On the other hand, manufacturing enterprises should accelerate independent research and development to realize the upgrading of the manufacturing industry chain, and carry out intelligent manufacturing activities. The data sharing mechanism is used to promote the collaborative production and manufacturing between the various links in the industry chain, and truly form the development of the digital economy based on intelligent manufacturing.

## 5. Conclusion

In short, countermeasures and suggestions for the high-quality development of the manufacturing industry are put forward, guided by the problems faced by manufacturing enterprises, such as weak digital infrastructure, weak industrial innovation capacity, insufficient digital productivity and poor industrial chain synergy. Manufacturing enterprises should strengthen infrastructure construction, especially the coverage of digital infrastructure, and build industrial Internet platforms and data centers. It is necessary to build technological innovation platforms such as R&D platforms, achievement transformation platforms and talent service platforms to improve the overall quality of scientific and technological innovation. It is necessary to play a leading role in enterprises, form advanced demonstration sites for digitization, strengthen exchanges between enterprises, and promote the digitization of the entire industrial chain. It is necessary to strengthen data opening and sharing, establish standard data interfaces, accelerate independent research and development, and promote collaborative production and manufacturing. At the same time, manufacturing enterprises should also combine the actual situation of their own development, learn from the advanced experience of other enterprises, and formulate a suitable strategy for the development of the digital economy, to truly promote the deep integration of the digital economy in the development of the enterprise, and help enterprises achieve high-quality development.

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