



American Journal of Financial Technology and Innovation (AJFTI)

ISSN: 2996-0975 (ONLINE)

VOLUME 3 ISSUE 1 (2025)

PUBLISHED BY
E-PALLI PUBLISHERS, DELAWARE, USA

Research on the Development Direction of the Industrial Economy Under the Background of the Digital Economy

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Article Information

Received: November 05, 2024

Accepted: December 07, 2024

Published: January 23, 2025

Keywords

Digital Economy, High-Quality Development, Industrial Economy

ABSTRACT

In this context, this paper introduces the digital economy under the background of industrial economy stage achievements, such as through the development of the digital economy and industrial economy integration and management and find the industrial economy intelligent transformation of three promotion path, and through the relevant research found that the industrial economy is facing development difficulties, so this paper discusses the digital economy to realize transformation and upgrading of industrial economic structure facing realistic problems, such as intelligent manufacturing, green sustainable development, personalization, cross-border integration innovation. Finally, in view of the problem of how to further develop industrial economy under the background of digital economy, relevant countermeasures and suggestions on the development direction of industrial economy under the background of digital economy, hoping to provide effective suggestions for the transformation of industrial economy to digital and the realization of high-quality development.

INTRODUCTION

The rapid rise of the digital economy has become a new engine for global economic growth. Digitization not only improves production efficiency and product quality, but also makes the production process more flexible and personalized. According to statistics, in the past five years (2014-2019), the overall scale of digital economy has increased from 16.16 trillion yuan to 35.8 trillion yuan, the total GDP has increased from 63.51 trillion yuan to 98.91 trillion yuan, while the proportion of digital economy in GDP has increased from 26.1% to 36.2%, as shown in Figure 1. It can be seen that the digital economy is developing faster and faster, and its market size is also expanding, so we should accelerate the development of the industrial economy under the influence of the digital economy. Take the market size of Chinas digital economy market as an example. In 2008, the market size of the digital economy was only 4.8 trillion yuan, and increased to 27.2 trillion yuan in 2017, while in 2021, it grew rapidly to 45.5 trillion yuan, with a linear growth rate (Jianhui & Guobin, 2023) As an important part of the national economy, the industrial economy is facing unprecedented challenges and opportunities. Therefore, this paper will pay attention to the challenges and coping strategies of industrial economy in the era of digital economy, and discuss how to better use digital technology to optimize resource allocation, improve production efficiency and innovation ability, so as to promote the development of industrial economy to the direction of higher quality, more efficient and more sustainable.

LITERATURE REVIEW

The Digital economy and the industrial economy

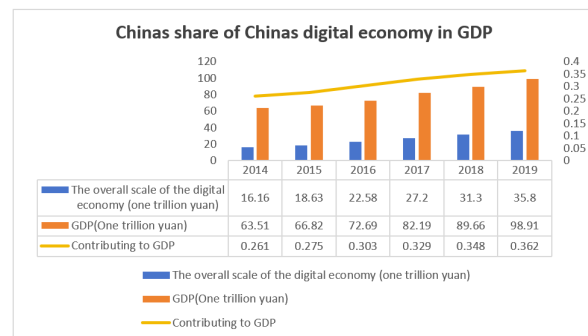


Figure 1.1: portion of Chinas digital economy in GDP

As the most significant form of economic development in the 21st century, digital economy takes digital information and technology as the core resources, and has changed the operation mode of the traditional economy. It not only optimizes the allocation of resources with high efficiency and popularization, but also promotes the diversified development of the economy through technological innovation. The core position of data in the digital economy urges enterprises to take user demand-oriented and realize the transformation from production-oriented to market-oriented. The distinctive feature of this economic form is its deep dependence on information technology and its ability to respond quickly to market changes.

Industrial economy, also called resource economy, that is, economic development mainly depends on the possession and allocation of natural resources. Since the 19th century, developed countries in the world have successively completed the industrial revolution in science and technology, tractors and machine tools have replaced manual production tools, cars, trucks, ships and

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aircraft have replaced backward means of transportation, and the production efficiency has been greatly improved (Meihan *et al.*, 2023). However, the industrial and economic development in this stage mainly depends on the possession of natural resources. With the advent of the digital economy era, the industrial economy will shine new again. Digital transformation of industrial economy and the development of digital economy have become new engines to promote the development of Chinas industrial economy. The two will empower each other, which will further accelerate the transformation of industrial economy and promote the development of industrial economy to a higher level.

Digital economy

Digital economy is a concept with a relatively broad connotation. All the economic forms that directly or indirectly use data to guide resources to play a role and promote the development of productive forces can be included in its category. But we should not simply equate between the digital economy and the Internet economy and the virtual economy. They are only part of the digital economy. At present, the digital technology, goods and services are not only in the traditional industry direction, multifaceted and chain accelerated penetration (i. e., digital industry), and in the push such as Internet data center (Internet Data Center, IDC) construction and service digital industry chain and the development of industrial cluster (i. e., digital industrialization). According to the data of Chinas digital Economy Development Research Report (2023). In 2022, the scale of Chinas digital economy reached 50.2 trillion yuan, with a nominal year-on-year growth of 10.3%, which has been significantly higher than the nominal GDP growth rate of the same period for 11 consecutive years. The proportion of digital economy in GDP is equivalent to the proportion of the secondary industry in the national economy, reaching 41.5% (Niaoer, 2022). It can be concluded that the development of the digital economy over time is particularly important for China and even for the whole world.

Industrial economy

Industrial economy is an important part of the

development of human society, which refers to the use of natural resources and human machinery to produce commodities. The development of the industrial economy not only creates conditions for economic growth and employment, but also provides support for social progress and scientific and technological innovation. Industry refers to the economic activities that use raw materials, energy and labor force to produce a variety of products and commodities through a series of production processes and technologies. Midea Group uses digital technology M. Iot to gain insight into customers, improve products and services, and achieve customer satisfaction and stability. Build the “T + 3” mode to realize the value transfer, and build an online Midea shopping mall to expand the online channels. Establish the VMI operation mode, improve the product system through data sharing, enhance the competitive advantage, and promote the global expansion of the brand. From the successful experience of Midea, digital management innovation has improved the quality of enterprise products and highlights the management advantages (Tie & Zichi, 2021). From the example of Midea Group, how important it is for the industrial economy to develop further along with the digital economy. In a word, industry is one of the pillars of the modern economy. With the continuous progress of science and technology and the development of human society, industry will also continue to evolve and grow.

MATERIALS AND METHODS

The influence of the digital economy on the development of industrial economy

The author analyzes the index system of explanatory variables and explanatory variables in the high-quality development of digital economy. As shown in Table 1 (Yuhua *et al.*, 2022) It is concluded that industrial economy is an important link to promote the continuous development and progress of human society, and digital economy is an important link to promote industrial development and upgrading. On the whole, when the industrial economy is transformed and upgraded, more funds should be invested in the industrial economy that can make a significant contribution to the economic growth in the future.

Table 1: Index system of explanatory variables and explanatory variables for high-quality industrial development

Level 1 indicators	Secondary indicators	Level 3 indicators	Level 4 index
The development level of the digital economy	Internet penetration rate	Number of Internet broadband access users per 100 people	+
	Internet-related practitioners	Number of employees employed in computer, software and communication services	+
	Internet-related industries	Per-capita telecommunications business volume	+

	Number of mobile Internet users	Number of mobile phones users per 100 people	+
	Development of digital inclusive finance	The China Digital Financial Inclusion Index	+
High-quality development level of the industrial economy	Economic benefits improved	Total labor productivity of industrial enterprises above designated size	+
		Profit rate of total assets of industrial enterprises above designated size	+
		Per capita assets of industrial enterprises above designated size	+
	Structural optimization and coordination	Industrial added value above designated size / national average industrial added value above designated size	-
		Thiel index	-
	Sustainable development capacity innovation ability	Energy consumption per unit of gross domestic product	-
		Sulfur dioxide emissions per unit of gross domestic product	-
		Smoke (powder) dust emissions per unit of gross domestic product	-
		Patent application number per 10,000 people	+
		Number of students or above / average number of industrial enterprises above designated size	+

The impact of the digital economy on the industrial economy

The impact of digital economy on industrial economy is the gap of digital transformation of industrial economy; secondly, the input-output of digital transformation is difficult to quantify in the short term. Finally, there is a shortage of talent in the digital economy. China's industrial economy is stepping into a critical stage of digital transformation, showing a trend of comprehensive penetration from consumer-oriented to business-oriented and to its upstream and downstream industrial chains. Although the traditional industrial economy is facing huge development pressure, digital transformation has become the only way to seek a breakthrough and rebirth, but the road of transformation is not smooth. Specifically, the relevant industrial enterprises often explore the digital path due to the lack of rich transformation practice experience and systematic transformation data support (Jewel, 2023). Nowadays, the construction of R & D institutions and professional talents in the field of intelligence is facing severe challenges, especially the lack of high-end technical talents, scientific research and innovation forces and experts in core fields, which seriously restricts the pace of digital transformation in the field of digital economy.

Specific impact of digital economy on the development of industrial economy

The first is technological innovation, to promote the industrial economy and technological upgrading. Technological innovation is the core driving force of the digital economy in enabling the industrial economy. Under the background of digital economy, the industrial economy is undergoing the transformation from the traditional industrial economy to intelligence and automation. The application of Internet, big data, artificial intelligence and other technologies makes product design more accurate and production process more efficient. For example, through big data analysis to predict market demand, the industrial economy can achieve more flexible production planning and inventory management. Secondly, the industrial structure optimization. The digital economy promotes the upgrading of the industrial economy. Digital economy has an important influence on the optimization and upgrading of the industrial structure of the industrial economy. Through the digital transformation, the industrial economy can be better integrated into the global value chain and improve its position in the international division of labor. The digital economy also promotes the transformation of the industrial economy from traditional production with low added value to intelligent manufacturing with high

added value. Finally, the improvement of management efficiency and the application of digital technology in industrial economic management. In the era of digital economy, the management mode of industrial economy is undergoing fundamental changes.

Challenges facing the industrial economy in the digital economy

With the rapid development of digital economy, its influence on the development of industrial economy is increasingly significant, thus providing new opportunities for the high-quality development of industrial economy. It is of great theoretical and practical significance to study how digital economy promotes the endogenous driving force and high-quality development of industrial economy. This paper selected 2012-2021 China 30 provinces (municipalities, autonomous regions) (excluding the Tibet autonomous region and Hong Kong, Macao and Taiwan region) industrial enterprises and digital economy panel data to empirical research, collected 300 data samples, data samples from 30 provinces and China industrial statistical yearbook the China science and technology statistical yearbook China high-tech industry yearbook China environmental statistics yearand CNNIC database make descriptive statistics, as shown in Table 2 below (Qinghe, 2024). Found that the challenges of future industrial economic development are mainly reflected in the following aspects:

First, intelligent manufacturing: intelligent manufacturing is one of the main trends of the future

development of industrial economy. Through the introduction of artificial intelligence, big data analysis and Internet of Things technology, enterprises can realize the automation, intelligence and networking of the production process, improve production efficiency, reduce costs, and promote the intelligent transformation and upgrading in the industrial economy.

Second, green and sustainable development: with the continuous enhancement of environmental protection awareness, green and sustainable development has become an inevitable choice of industrial and economic development. In the future, the industry will pay more attention to the economical use of resources and environmental protection, promote circular economy and clean production, reduce the impact on the environment, and achieve sustainable development.

Third, personalized customization: consumer needs are increasingly personalized and diversified. In the future, industrial economic products will pay more attention to flexible production and customized services. Through the rapid response to the market demand, to achieve personalized customized production, improve product quality and customer satisfaction.

Fourth, cross-border integration innovation: In the future, the development of industrial economy will pay more attention to cross-border integration innovation, and realize cross-border integration and innovation of technology through cooperation and exchanges in different industries and fields. This will promote the integrated development of industries and promote the optimization and upgrading of the industrial structure.

Table 2: Descriptive statistics

VARIABLES	(1)	(2)	(3)	(4)	(5)
	N	Mean	Sd	Min	Max
year	300	2016	2.877	2012	2021
id	300	15.67	8.916	1	31
GOV	300	0.263	0.113	0.105	0.758
TECH	300	0.0217	0.0150	0.00539	0.0676
DE	300	0.130	0.101	0.0173	0.577
Quality	300	0.208	0.112	0.0620	0.822
HUM	300	0.0208	0.00550	0.00852	0.0425
FDI	300	0.0183	0.0144	0.000100	0.0796

RESULTS AND DISCUSSION

Development direction of industrial economy under the background of digital economy

In high-quality development, we need to promote a new type of industrialization, make the industrial economy more high-end, intelligent and green, and accelerate the deep integration of the digital economy and the industrial economy, so as to build a modern industrial economy. In the current complex pattern of the global economy, digital transformation has become an irreversible trend, and its necessity and urgency have become increasingly obvious. And through this paper studies the relationship between the digital economy

and industrial economy, can through to accelerate the integration of digital economy and industrial economy and management, digital economy under the background of intelligent transformation of three promotion path as the benchmark, further improve the digital economy of industrial economy high quality development and related contributions.

Accelerate the integration and management of digital economy and industrial economy

The revitalization and development of modern industry cannot be separated from the strong support of information, and the reform and progress of information

is also based on the prosperity of industry as the material. Therefore, it is necessary to continuously strengthen the organic integration of industrialization and information, and carry out standardized management, so that the two play a maximum role. First, we will accelerate the transformation and upgrading of the industrial economy. Although Chinas industrial economy maintains a good momentum of development, in the rising period, but we can not ignore the severe and complex economic situation we are facing, Chinas domestic demand growth rate is slow, the continuous contraction of external demand are threatening the healthy and rapid development of industrial economy (Kongtuan *et al.*, 2023). Therefore, while maintaining the stability and continuity of the national macroeconomic policies, it is necessary to continuously increase the further adjustment of the industrial structure and accelerate the transformation and upgrading of the industrial economy. Second, accelerate the comprehensive integration of industrialization and digitalization. Vigorously promote the integration of digital economy and industrial economy, realize the integration of information technology and industrial energy conservation and emission reduction, and promote new information technology in the power, steel and paper industries, so as to effectively promote the development of energy conservation and emission reduction work, and further protect Chinas ecological environment. Finally, the new information technology means to promote the management innovation of industrial economy. In order to realize the rapid development, it is necessary to carry out the continuous innovation of management mode, the development of modern information technology and the deepening of information technology, which provides a good opportunity and platform for the innovation of management mode of industrial economy. At the same time, after enterprises should integrate new technologies, and gradually establish new management ideas and prescriptions to meet the needs of the industry

Three improvement paths for the intelligent transformation of the industrial economy under the background of the digital economy

The first path is to build an open and shared digital platform ecology. Driven by the wave of digital economy, the core of the transformation and upgrading of industrial economy lies in building an open and shared digital platform, so as to adapt to the rapid changes of market demand and improve the competitiveness of industrial economic enterprises. This process involves multi-dimensional strategic deployment and implementation, aiming to realize the intelligent and digital operation of industrial economy through technological innovation, channel optimization and value chain reconstruction. Industrial economic enterprises should actively introduce the most advanced technological means, such as artificial intelligence, big data, cloud computing, etc., in order to improve the

product performance, optimize the operation mode and improve the service quality. This process can not only promote enterprises to form a unique competitive advantage and brand influence, but also guide industrial enterprises to the direction of intelligent and digital. Take a high-end equipment manufacturing enterprise as an example, through the introduction of intelligent manufacturing system and data analysis platform, it has realized the fine management of the production process and the continuous improvement of product quality, thus occupying a leading position in the global market (Meixin & Jiayi, 2023). At the same time, in the face of the digital transformation of consumer behavior, industrial economic enterprises need to flexibly adjust their sales strategies and publicity channels, and promote the migration of product sales and brand promotion from the traditional offline mode to online platforms. In the process of the transition, Enterprises should adhere to the principle of putting efficiency first, quickly respond to the changes in market demand, reduce market risks and expand the market share through the integration of online and offline operation mode

The second path, increase policy support, promote production and manufacturing digitalization. In the grand blueprint of the transformation and upgrading of small and medium-sized enterprises in the industrial economy, the digital transformation of production and manufacturing occupies a pivotal position, and its goal is to gradually promote the transformation from manual to information, digital, and finally towards the leap of intelligence. However, in the face of this transformation challenge, small and medium-sized enterprises often fall into the situation of “wait and see”, “hesitation” or even “avoidance” due to the high investment cost, unclear short-term benefits and the shortage of intelligent system operation and maintenance talents. In view of the above difficulties, cloud, low-cost, lightweight digital solutions emerge at the historic moment, and become the preferred path for small and medium-sized enterprises to step into the threshold of digital transformation. In order to help small and medium-sized enterprises overcome the transformation obstacles, many places introduce relevant policies to reduce the burden of enterprise transformation, including but not limited to providing financial support for financial subsidies, tax incentives, low-interest loans, as well as the establishment of special funds to support the digital transformation projects of small and medium-sized enterprises; At the same time, strengthen the construction of public service platform, provide one-stop services of technical consultation, personnel training, solution docking to reduce the cost and risk of small and medium-sized enterprises in the process of digital transformation (Yu, 2022). With policy guidance and technical support, in order to win the initiative of market competition and the broad development of the future. The third path is to deepen digital education and cultivate technical people. In view of the unique demand for talent skills in the production

field, compared with the digital transformation in the consumer field, it relies more on the optimal allocation and in-depth mining of global network talent resources. Therefore, the construction of a comprehensive and systematic digital talent education system has become the key driving force to promote the high-quality development of industrial economy. First of all, the higher education system actively adapts to the changes of the digital era, and promotes the in-depth development of digital specialty and interdisciplinary integration by adjusting the direction of specialty setting and discipline construction. Secondly, enterprises should increase the training of employees digital skills (Hao, 2022). This not only helps the old employees to quickly adapt to the intelligent production environment, but also promotes the internal knowledge inheritance and skill iteration of the enterprise. Enterprises can provide employees with diversified learning channels and rich learning resources by establishing internal training colleges, introducing external professional training institutions or carrying out online learning platforms. Finally, it should play a leading role in the universal digital education, and promote the popularization and dissemination of digital knowledge in the whole society through the implementation of the digital literacy promotion plan. The Internet, television, radio and other channels are used to carry out digital popular science education, and the design is suitable for residents of different ages and different cultural levels. Course content and teaching methods to ensure that digital knowledge covers a wider range of people. All sectors of society are encouraged to participate in the construction of digital education, and form a diversified digital education ecological body with government guidance, enterprise participation and social support.

CONCLUSION

To sum up, this article deeply explores how the digital economy can promote the development of the industrial economy towards higher quality. From the perspective of the digital economy, two effective ways for the development of the industrial economy are proposed. One is to accelerate the integration and management development direction of digital economy and industrial economy; The second is the three development directions for the intelligent transformation of industrial economy under the background of digital economy. We can see that the digital economy, as a new engine of the global economy, is profoundly changing the development trajectory of the industrial economy. Through digital transformation, industrial economic enterprises have not only achieved significant improvements in production efficiency and continuous optimization of product quality, but also promoted the optimization and upgrading of industrial structure. Despite facing many challenges during the transformation process, industrial economic enterprises should further strengthen technological innovation, optimize industrial structure,

improve management efficiency, and attach importance to talent cultivation and technological updates. At the same time, enterprises should actively explore new business models and use digital means to optimize supply chain management and customer relationships, in order to adapt to the increasingly changing market demands and competitive environment.

REFERENCE

- Fei, L. (2023). Research on the upgrading and transformation of manufacturing enterprises in 2023. *Shandong Textile economy*, (2), 1-4.
- Hao, X. (2022). *Digital economy enables to study the realization path of high-quality development of Anhui manufacturing industry*. Bengbu: Anhui University of Finance and Economics.
- Jianhui, J., & Guobin, A. (2023). Research on the driving influence of digital economy on electronic information producer services. *Chinas science and technology industry*, (6), 49-52.
- Meihan, G., Kunxu, W., & Ziwei, P. (2023). Discussion on high quality endogenous power and ways of digital economy enabling manufacturing. *Shopping mall modernization*, (20), 135-137.
- Meixin, F., & Jiayi, L. (2023). Research on the impact of digital economy development on manufacturing upgrading in The Beijing-Tianjin-Hebei region. *Business economy*, (12), 23-26.
- Niaoer, Y. (2022). Optimize the digital trade ecology to enable the integrated development of the two industries. *Ningbo Economy (Sanjiang Forum)*, (3), 9-13.
- Qinghe, C. (2024). Research on the intelligent transformation path of equipment manufacturing industry in L Province under the background of 2024 Digital Economy. *The Chinese market*, (22), 191-194.
- Tie, L., & Zichi, L. (2021). Digital technology enables high-quality development of manufacturing: based on the perspective of value creation and value acquisition. *Academic Monthly*, 53(4), 56-65.
- Tuan, L. K., Xuanhao, Z., Jie, H. (2023). Research on the spatial effect of digital economy enabling manufacturing industry upgrading. *Journal of Tianjin University of Commerce*, (43), 3-9.
- Wang, X., Ju, Z., Kovshar, S. N., Leonovich, S. N., & Solopova, N. A. (2023). The use of non-metallic fiber in the protection of building materials and its impact on the environment. *Экономика строительства*, (7), 86-91.
- Xianpeng, W., & Haoxuan, Y. (2024). *Commercial economic value of non-metallic fiber concrete*.
- Yu, M. (2022). The internal mechanism and realization path of the transformation of manufacturing industry. *Shopping mall modernization*, (11), 110-112.
- Yuhua, L., Chengjun, L., & Ziwei, X. (2022). Research on the configuration path of service-oriented manufacturing transformation in the context Digital Economy. *China Science and Technology Forum*, (8), 68-76.