WEP Warwick Evans Publishing

International Journal of Global Economics and Management

ISSN: 3005-9690 (Print), ISSN: 3005-8090 (Online) | Volume 3, Number 1, Year 2024
DOI: https://doi.org/10.62051/ijgem.v3n1.53
Journal homepage: https://wepub.org/index.php/IJGEM/index

Research on the Development Mechanism and Path of Wenzhou Digital Industrial Cluster Under the Background of Digital Economy

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ABSTRACT

With the advent of the digital age and the development of artificial intelligence, digital economy has become the main economic form of today's society. In this context, the conditions for the development of digital industrial clusters have been formed, and industrial clusters have become an important support for the high-quality development of national and regional economies and an important factor affecting the international competitiveness of industries. The digital industrial cluster in Wenzhou area is also developing rapidly in recent years. Based on the analysis of the digital industrial cluster in Wenzhou area, this paper puts forward five key mechanisms for the development of the digital industrial cluster in Wenzhou, namely, the market mechanism and enterprise autonomy, the innovation-driven mechanism. Policy guidance and support, network and synergistic effect and talent attraction and training. The specific strategies to promote the development of Wenzhou digital industry cluster include strengthening infrastructure construction, optimizing innovation ecology, introducing and cultivating high-end talents, etc., hoping to provide reference for relevant workers.

KEYWORDS

Digital economy; Digital industry cluster; Development mechanism; Wenzhou

1. INTRODUCTION

The digital age has arrived, and digital economy has become the main economic form after agricultural economy and industrial economy.In the outline of the 14th Five-Year Plan, it is clearly stated that China should speed up digital development, create a good digital ecology, and build a digital-oriented country in an all-round way.As an important driving force for high-quality development, the vigorous development of the digital economy has become a key engine to promote the innovative development of enterprises.As a typical private economic development model in China's eastern coastal region, Wenzhou economy is known for the flexibility of market mechanism, the prosperity of private enterprises, and the unique "Wenzhou model".At present, Wenzhou economy shows a steady development trend. Traditional industries cover manufacturing, clothing, textile, machinery manufacturing and other fields. Relying on rich resource endowment and labor force advantages, a relatively complete industrial chain and industrial cluster have been formed.However, under the background of digital economy, traditional industries are facing the urgent task of transformation and upgrading.At the same time, the emerging digital industry has become increasingly prominent in Wenzhou's economy, becoming an important force to promote economic transformation and upgrading.Wenzhou actively responds to the national digital economy development strategy, and increases the cultivation and development of the digital economy industry.Driven by emerging technologies such as cloud computing, big data and the Internet of Things, the digital economy industry has been growing in scale and its innovation capacity has been

significantly improved.A number of competitive digital economy enterprises have grown rapidly, injecting new impetus into Wenzhou's economic development.

2. LITERATURE REVIEW

2.1. Digitization Related Research

In recent years, digitalization research has attracted much attention from scholars. Digitalization is a series of processes covering data collection, discovery, processing, analysis and management. A series of research results have been formed mainly in the aspects of enterprise digital transformation, industry digitalization, digital industry, and digital operation mode. According to the research theme, the text mainly focuses on the connotation of digitalization, enterprise digitalization, digital industry and other aspects of digitalization research status and development trends are reviewed.

2.1.1. Digital connotation research

With the advent of the digital age and the development of artificial intelligence, digital economy has become the main economic form after agricultural economy and industrial economy. Digitalization is a series of processes covering data collection, mining, processing, analysis and management. From a micro perspective, Jing Wenjun (2019) believes that digital network platform, based on multiple network effects, increases effective supply and demand information, improves price mechanism, realizes optimal matching between supply and demand, and changes transactions and circulation activities, thus improving the level of economic equilibrium. From a macro perspective, An Tongliang et al. (2020) believe that the continuous extension of the digital application field will promote major changes in the combination mode and production model of production factors.

2.1.2. Enterprise digital transformation

Chen Yan (2020) believes that the digital era has changed the innovation model, organizational structure and ecosystem of enterprises, requiring enterprises to rethink and innovate their corporate strategies and business models. Based on innovation diffusion theory and technology-organization-environment framework, taking enterprise digital transformation as an example of technology-driven innovation,

2.1.3. Digital industrialization

Kang Tiexiang (2008) proposed that the digital industry evolved from the traditional information industry. Zhang Xiao (2018) believes that digital industry is the core of the development of digital economy and the foundation of industrial digital integration. Yang Dapeng (2019) believes that the essence of digital industrialization is the process of digital technology knowledge flow and digital product innovation, and puts forward three driving models of digital industrialization, namely, R&D institution-driven model, leading enterprise-driven model and characteristic town driven model. Different driving models will lead to the differentiation path of digital industrialization.

2.2. Industrial Cluster

In the early 1990s, Michael E. Porter, an American strategic management scientist, first proposed the concept of industrial cluster, which refers to the spatial gathering of a large number of closely related enterprises and related supporting institutions in a specific field, usually a market dominated by a dominant industry. And the formation of a strong, sustained competitive advantage. He believes that industrial clusters promote the formation of new enterprises by reducing the cost of transactions, and thus are the foundation of a country's economic competitiveness. From the end of 1990s to the beginning of 21st century, domestic scholars began to study industrial clusters, and the research focus gradually shifted from the causes, formation conditions, evolution process, life cycle and agglomeration effect to the transformation and upgrading of industrial clusters. Both digital

industrialization and industry digitization can define the development process of industrial clusters.In the process of Zhejiang Province comprehensively promoting the "No. 1 Project" plan and striving to become the national digital economy demonstration Province, the goal of implementing the digital industry upgrading project and building the national industrial digital development leading area is put forward. According to Liu Shuchun (2019), digital industrialization is to promote the formation and development of digital industry through the research and development and extensive market application of digital technologies such as big data, cloud computing and artificial intelligence. Digital industrialization is the process of digital technology knowledge flow and digital product innovation. Yang Dapeng (2020) divides digital industrialization into three stages, including technology layer, product layer and industry layer. In addition, he also proposed three driving models of digital industrialization, which are R&D institution-driven model, leading enterprise driven model and characteristic town driven model. Different driving models will lead digital industrialization in different directions. The result of digital industrialization is that the development of the digital industry is of great significance to the development of science and technology, economy and society, and it is necessary to further explore the economic attributes of data elements as new means of production, and accelerate the role of information technologies such as big data, blockchain, cloud computing, virtual reality and artificial intelligence in the creation and transformation process of products and services in the digital society. Industrial digitalization refers to the use of digital technology to widely promote the digital transformation of traditional industries, to provide digital technologies, products, services and solutions for the communication information and Internet business of the first, second and third industries, so as to promote the development of new integrated industries such as industrial Internet, integration of the two, intelligent manufacturing, vehicle networking, and platform economy. The application of digital technology has made traditional industries significantly improve in terms of production quantity and efficiency, thus becoming an important part of the digital economy. The concept of digital industrial cluster can generally refer to the gathering area formed by traditional industries through digital transformation, or it can refer to the cluster formed by digital high-tech enterprises.

2.3. Research Review

Although a large number of researches focus on the exploration of emerging industrial clusters, there are few literatures on the systematic exploration of digital industrial clusters, and relevant researches need to be followed up urgently. This paper aims to deeply analyze how Wenzhou city promotes the agglomeration and upgrading of digital industry in the era of digital economy by optimizing the allocation of resources, guiding innovative policies and strengthening the synergy between enterprises. This study aims to reveal the internal mechanism of the formation and development of digital industry clusters in Wenzhou, explore the path of sustainable growth, provide scientific basis for local governments to formulate effective strategies and enterprises to make strategic decisions, and then promote the transformation of regional economic structure and high-quality development, and provide referable models and experiences for other cities.

3. ANALYSIS OF THE CURRENT SITUATION OF WENZHOU DIGITAL INDUSTRY DEVELOPMENT

In February 2021, the 14th Five-Year Plan for Wenzhou National Economic and Social Development and the Outline of 2035 Long-term Goals were released, proposing the implementation of digital economy "No. 1 Project" version 2.0, focusing on the digital upgrading of traditional manufacturing industry and the construction of Wenzhou characteristic digital economy development cluster base, comprehensively promoting digital industrialization and industrial digitalization. To build a national digital industry innovation and development demonstration zone.Many core industries in Wenzhou

have formed a thriving digital industrial cluster in the process of the government's active promotion of the digital and intelligent transformation of the traditional manufacturing industry.

3.1. E-commerce and Cross-border E-commerce

As an area of traditional strength, Wenzhou has taken advantage of its strong manufacturing base and global trade network to vigorously develop e-commerce and cross-border e-commerce.Many small and medium-sized enterprises have rapidly expanded domestic and foreign markets through e-commerce platforms, gradually forming a large-scale online sales network.The digitalization of e-commerce and cross-border e-commerce has not only promoted the global circulation of local goods, but also promoted the development of related services such as logistics, payment and data analysis.

3.2. Smart Manufacturing and Industrial Internet Sectors

Wenzhou has actively promoted the digitalization and intelligent transformation of traditional manufacturing industries, especially in pillar industries such as clothing, footwear and electrical machinery.Through the application of the Internet of Things, big data, cloud computing and other technologies, enterprises realize the automation and intelligent management of the production process, which makes traditional enterprises improve the production efficiency and product quality, forming an industrial cluster effect.

3.3. The field of Information Technology and Software Services

Information technology service industries such as software development, information system integration, big data processing and cloud computing services have risen rapidly in Wenzhou, providing customized solutions and digital technology services to various industries and helping the digital transformation of traditional enterprises.

According to the "14th Five-Year Plan" for the Development of Digital Economy, during the "14th Five-Year Plan" period, Wenzhou will accelerate the construction of the national demonstration zone for digital transformation and development of traditional industries and the national demonstration zone for digital industry innovation and development, etc. By 2025, the added value of the city's digital economy will reach 650 billion yuan, accounting for 65% of GDP, ranking the top three in the province;The added value of the core industries of the digital economy will reach 100 billion yuan, accounting for about 10% of GDP.

The current situation of the development of Wenzhou digital industry cluster has shown a booming trend, and Wenzhou has successfully been selected as the second-level node city of national industrial Internet identification and analysis.Wenzhou has become a second-level node city, which means that Wenzhou's booming digital industry capability has been recognized at the national level.

4. RESEARCH ON THE DEVELOPMENT MECHANISM OF WENZHOU'S DIGITAL INDUSTRY CLUSTER

The rapid development of Wenzhou digital industry cluster benefits from the interaction and synergistic promotion of four core mechanisms: market mechanism, innovation mechanism, government role, network effect and synergistic mechanism.Below, we will explore in depth how these four mechanisms together shape and promote the development of Wenzhou digital industry cluster.

4.1. Market Mechanism: Demand-Driven and Competitive Cooperation

Market mechanism has played a crucial role in the development of Wenzhou's digital industrial cluster.First of all, market demand is the original driving force to promote the formation and development of the cluster.Wenzhou enterprises are keen to capture the market demand of digital transformation, especially in the fields of e-commerce, intelligent manufacturing and information technology services, and meet the diversified demands of consumers and business customers for digital products and services by providing customized solutions.In this process, the fierce market competition prompts enterprises to innovate continuously and improve the quality of products and services. At the same time, in order to enhance competitiveness, enterprises begin to explore cooperation models, form close links between the upstream and downstream of the industrial chain, and jointly cope with market challenges. This competitive relationship promotes the optimal allocation of resources within the cluster.

4.2. Innovation Mechanism: Deep Integration of Production, University and Research and Acceleration of Incubation

Innovation is the core driving force for the development of digital industrial clusters.Wenzhou actively builds the cooperation mechanism of industry, university and research, and forms a virtuous cycle of knowledge innovation and technology transformation through government guidance, enterprise participation and support from universities and scientific research institutions.For example, the establishment of digital industry innovation center, research and development center, encourage enterprises and universities to build laboratories, accelerate the industrialization of scientific and technological achievements.In addition, as a key link in the innovation ecology, incubators and accelerators provide full chain support for start-ups and growth enterprises from proof of concept to market promotion, reducing innovation risks, shortening the time-to-market of products, and effectively promoting the commercialization process of innovation achievements.

4.3. The Role of Government: Policy Guidance and Environment Creation

The government plays an indispensable role in the development of Wenzhou's digital industrial cluster.On the one hand, by making forward-looking policy plans, such as the Five-Year Doubling Implementation Plan for the Digital Economy, the development direction and goals have been clarified, providing a clear road map for the development of the digital industry.On the other hand, the government has increased financial input and set up special funds to support key technology research, major project construction and the introduction of outstanding talents, providing a solid material foundation for the rapid growth of industrial clusters.In addition, the government has focused on building public service platforms, including digital infrastructure, a public research and development platform, and an intellectual property protection system, to optimize the business environment, reduce enterprises' operating costs, and improve their overall competitiveness.

4.4. Network Effects and Synergies: Digital Technology Enablement

The deep application of digital technology has greatly enhanced the network effect and synergy mechanism of Wenzhou digital industry cluster.The application of cloud computing, big data, artificial intelligence and other technologies makes information sharing more convenient, supply chain management more intelligent and efficient, and the cooperation between enterprises more close.The rise of digital platforms, such as industry vertical e-commerce platforms and industrial Internet platforms, not only connects all links of the industrial chain and promotes the optimal allocation of resources, but also provides insights into changes in market demand through data analysis to help enterprises respond quickly.In addition, digital technology has also promoted cross-border integration, such as the combination of manufacturing with the Internet and cultural creativity,

giving birth to new business forms and models, further enriching the connotation and extension of the cluster, and enhancing the overall competitiveness of the cluster.

In short, the development of Wenzhou digital industry cluster is a complex systematic project, whose success benefits from the natural selection of market mechanism, the continuous drive of innovation mechanism, the effective guidance of government role, and the depth of network effect and collaborative mechanism stimulated by digital technology.These mechanisms interweave and complement each other, and jointly promote Wenzhou to sail away in the wave of digital economy, and steadily move forward toward the goal of building a digital economic highland in southeast Zhejiang.

5. EXPLORE THE DEVELOPMENT PATH OF WENZHOU DIGITAL INDUSTRY CLUSTER

The development of Wenzhou digital industry cluster requires a series of specific and targeted strategies. This paper tries to design the implementation path map of short -, medium - and long-term goals from three aspects: strengthening infrastructure construction, optimizing innovation ecology, and introducing and cultivating high-end talents.

5.1. Strengthen the Construction of Infrastructure

Short-term goal: Accelerate the deployment of next-generation information infrastructure such as 5G networks, data centers and cloud computing platforms to ensure the hardware foundation for the development of the digital industry.The "Smart park" plan will be implemented to improve the digital management of industrial parks and attract digital enterprises to settle in.

Medium-term goal: Promote the construction of industrial Internet platforms, realize the deep integration of manufacturing enterprises and information technology, and improve the intelligent level of the industrial chain.Improve the data sharing and exchange platform, and promote the efficient flow and utilization of information resources.

Long-term goal: to build a comprehensive coverage and technologically advanced smart city infrastructure system, including smart transportation, smart energy, smart environmental protection, etc., to provide a comprehensive supporting environment for digital industrial clusters.

5.2. Optimize the Innovation Ecology

Short-term goal: Establish a government-industry-university-research collaborative innovation alliance, encourage enterprises to cooperate with universities and research institutions, and rapidly promote technological innovation and achievement transformation.A digital industry innovation fund will be set up to support start-ups and high-growth projects.

Medium-term goal: optimize the layout of innovation carriers, build a number of high-level incubators, accelerators and innovation centers, and provide professional services and resource docking.Implement intellectual property protection and incentive policies to create a favorable atmosphere for innovation.

Long-term goal: To form an open and inclusive innovation ecosystem, attract international innovation resources, promote international cooperation and exchange, and build Wenzhou into a regional and even international digital innovation highland.

5.3. Introducing and Cultivating High-End Talents

Short-term goal: Formulate targeted talent introduction policies to attract high-level talents in digital technology, management and other fields through tax incentives, housing subsidies and other

measures.Launch a school-enterprise cooperation talent training program to strengthen the supply of local talents.

Medium-term goal: to establish a digital economy talent database, accurately connect enterprise demand and talent supply, and improve the efficiency of human resource allocation.Carry out large-scale digital skills training to improve the overall digital literacy of the labor force.

Long-term goal: to build a complete digital talent development system, from basic education to lifelong learning, to form a multi-level and wide-ranging education and training system, to ensure Wenzhou's talent competitive advantage in the era of digital economy.

Through the implementation of the above strategy in stages, set a clear timetable and responsibility allocation, to ensure the smooth achievement of the goals of each stage.The short-term strategy focuses on the rapid construction of infrastructure and the initial construction of innovation environment, the medium-term is to deepen the construction of innovation system and talent system to achieve a qualitative leap in the industry, and the long-term is to consolidate and improve, forming a sustainable development of digital economic ecology.Each step should pay attention to the evaluation and feedback, timely adjust the strategy to ensure the scientific and effective development path, and finally promote the Wenzhou digital industry cluster to a higher level of development.

6. CONCLUSIONS AND PROSPECTS

The key mechanism of the development of Wenzhou digital industry cluster mainly focuses on four aspects: market-driven, innovation-driven, government-guided and network coordination.These mechanisms interact and jointly promote the vigorous development of Wenzhou's digital industry.Policy makers should continue to optimize the policy environment, increase funding and policy support, guide enterprises to transform and upgrade, and pay attention to the integration of international rules to enhance global competitiveness.At the enterprise level, enterprises need to take the initiative to embrace digitalization, increase investment in research and development, strengthen industrial chain synergy, and enhance their core competitiveness.All sectors of society, including educational institutions and industry associations, should take an active part in building a harmonious and symbiotic digital ecology.

ACKNOWLEDGEMENTS

Fund Project:This research is supported by Wenzhou Science and Technology Plan Project “Research on the Development Mechanism and Path of Wenzhou Digital Industrial Cluster Under the Background of Digital Economy” of Wenzhou Science and Technology Bureau (Project No.R2023050).

REFERENCES

[1] Wu Qiuming, Kong Meiying, Wang Xiaoqing. History, hot spots and Frontiers of industrial cluster research at home and abroad: A comparative analysis based on citespace [J]. Technical Economics and Management Research, 2020(8):8.

[2] D T. The Digital Economy: Promise and Peril in the Age of Networked Intelligence (1) [M]. NewYork: McGrawHill, 1996: 55-60.

[3] Yang Dapeng. Research on the model and path of digital Industrialization: A case study of Zhejiang [J]. Journal of the Party School of the CPC Hangzhou Municipal Committee. 2019, (5).76-82.

[4] Study on the mode and path of digital industrialization in Zhejiang Province [J]. Foreign Trade and Economics, 2023, 05(01): 41-43. (in Chinese)

[5] Zhao C, Chen K H, MU R P. The digital innovation ecosystems: Theory building and a research agenda [J]. Science Research Management, 2021, 42(3):1-11.

[6] Zhu H L, Wang C J. Industry Digitalization Against the Strategic Background of the New Development Paradigm: Theory and Countermeasures [J]. Finance & Trade Economics, 2021, 42(03):14-27.

[7] Meng F L, Tian Z R, Yao X. Research on Operation Mechanism and Evolution of Digital Economy Ecosystem Based on Lotka-Volterra Model [J]. Journal of Hohai University(Philosophy and Social Sciences), 2020, 22(2):63-71, 107.

[8] Zhang G, Mcadams D A, Shankar V, et al. Modeling the Evolution of System Technology Performance When Component and System Technology Performances Interact: Commensalism and Amensalism [J]. Technological Forecasting and Social Change, 2017, 125:116-124.

[9] Ding Zhifan. Research on the mechanism of digital economy driving high-quality economic development: a theoretical analysis framework [J]. Modern Economic Research, 2020(01): 91-98.]

[10] Li Teng, Sun Guoqiang, Cui Gege. Digital Industrialization and Industry Digitalization: Two-way linkage Relationship, Industrial network Characteristics and Digital Economy Development [J]. Research of Industrial Economics, 2021(05): 54-68.