

Discussion on the Path of Promoting Digital Industrialization and Industrial Digitalization Linkage Development in Liaoning Province

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Abstract

Collaborative promotion of digital industrialization and industrial digitization is the main goal and task of the 14th Five Year Plan period. The overall digital economy in Liaoning Province is showing a positive development trend, with rapid development of digital industrialization, deepening of industrial digitization, and continuous improvement of the digital economy policy system. However, there are still problems in the development process, such as the lack of prominent core competitive advantages in the digital economy and a shortage of digital professionals. Liaoning Province should take the new development concept as the guide, and comprehensively promote the coordinated development of digital industrialization and industrial digitization from multiple aspects such as accelerating the construction of new base stations, increasing the training and introduction of digital talents, etc., in order to accelerate the high-quality economic development of Liaoning Province.

Keywords

High Quality Development; Digital Industrialization; Industrial Digitalization.

1. Introduction

The digital economy is a new socio-economic form that emerges after the agricultural economy and industrial economy[1]. It has become the key to the impact of the new crown epidemic in the world, the conversion of economic growth, and reshaping the economic system. In recent years, China has accelerated the construction of a strong cyber nation and a digital China. The digital economy has achieved significant results. However, breakthroughs are still needed in core key digital technologies, and the development space for industrial digitization needs to be further expanded. General Secretary Xi Jinping proposed that to develop the digital economy, we need to accelerate the industrialization of digital technology and use new momentum to promote new development; we also need to promote industrial digitization and unleash the amplification, superposition, and multiplication effects of digital technology on economic development. Liaoning Province actively implements General Secretary Xi Jinping's requirements to build a "Digital Liaoning, Intelligent Manufacturing Strong Province", focusing on digital industrialization and industrial digitization, promoting the deep integration of digital economy and real economy, and driving industrial upgrading and structural adjustment. Therefore, how to achieve the coordinated development of digital industrialization and industrial digitization has become an important issue in the current socio-economic development.

2. Overview of Digital Industrialization and Industrial Digitalization Development in Liaoning Province

2.1. The Rapid Development of Digital Industrialization

The Liaoning provincial government has successively issued the three year action plan for the innovation and development of industrial Internet in Liaoning Province (2021-2023) and other policy documents, leading enterprises to accelerate the pace of "smart transformation and digital transformation". All cities in Liaoning Province and Shenyang demonstration zone have formulated a series of policies around industrial Internet, 5G and digital construction. Digital industrialization in Liaoning has a good foundation for development. The software industry started early, there are many enterprises, and the service outsourcing business income continues to rank first in the country. Shenyang, Beijing and Shanghai constitute three key areas of domestic integrated circuit equipment, gathering a number of leading enterprises. 36 secondary nodes of industrial Internet identity analysis have been put into operation, ranking the third in China. There are more than 9000 access enterprises, ranking seventh in the country, realizing the coverage of the whole province. In the next three years, Liaoning will enhance the development level of digital industry, vigorously develop the software industry, and strengthen the electronic components and equipment manufacturing industry.

2.2. The Digitalization of Industries Continues to Deepen

Liaoning Province takes intelligent manufacturing as the main direction, builds an industrial Internet platform, creates a provincial digital transformation promotion center, and accelerates the pace of digital transformation of traditional industries. By using the industrial Internet platform, data sharing and collaborative innovation from production and manufacturing, quality detection to customer feedback are realized, which greatly improves product quality and market competitiveness. As of now, the CNC rate of key processes in the province has reached 60.3%, and the penetration rate of digital R&D design tools has reached 78.4%. Among the 21 indicators of integration of industrialization and informatization, 18 indicators have a growth rate exceeding the national average growth rate. It is expected to cultivate more than 300 provincial-level intelligent factories and digital workshops, and more than 50 provincial-level digital transformation benchmark enterprises. Shenyang Sino German Equipment Park, Heping District and Shenbei New Area were selected as the new industrial demonstration base of industrial Internet countries, becoming the only one in Northeast China.

2.3. The Digital Economy Policy System is Constantly Improving

The continuous improvement of the digital economy policy system in Liaoning Province is an important guarantee for promoting the sustained and healthy development of the province's digital economy. The Liaoning Provincial Government and various departments have successively introduced a series of special policy measures, such as "Several Measures to Accelerate the Development of Core Industries in the Digital Economy in Liaoning Province". These policy measures cover multiple areas of the digital economy, including market-oriented allocation of data elements, digital industrialization, and industrial digitization, providing comprehensive policy support for the development of the digital economy. At the same time, Liaoning Province focuses on innovation in the process of policy-making, such as establishing a digital economy industry investment fund and implementing the "Xingliao Talent Plan". These innovative measures provide strong support for the development of the digital economy. With the continuous improvement of the digital economy policy system and the increasing implementation efforts, Liaoning Province's digital economy has achieved significant results. The scale of the digital economy in the province continues to expand, the core industries of the digital economy are developing rapidly, and the pace of digital transformation of traditional

industries is accelerating. The digital economy has become an important engine for promoting high-quality economic development.

3. Problems in the Process of Digital Industrialization and Industrial Digitization Development in Liaoning Province

3.1. The System and Mechanism for Digital Industrialization and Industrial Digitization Development are Not Sound

Although Liaoning Province has issued a series of relevant policy documents, there are still problems in practical operation, such as incomplete top-level design and inadequate policy implementation. This may lead to a lack of clear direction and path for the development of digital industrialization and industrial digitization. At the same time, the development of digital industrialization and industrial digitization involves multiple departments and fields, requiring cross departmental collaborative cooperation. However, there may still be issues such as poor communication between departments and inadequate collaboration mechanisms in Liaoning Province at present. This leads to ineffective integration of resources and low efficiency in policy implementation. In addition, market mechanisms play an important role in the development of digital industrialization and industrial digitization. However, there may still be a problem of immature market mechanisms in Liaoning Province. For example, insufficient market competition, distorted pricing mechanisms, etc. This may lead to inefficient resource allocation, affecting the rapid development of digital industrialization and industrial digitization.

3.2. Significant Regional Differences in the Development of Digital Economy

As the economic centers of Liaoning Province, Shenyang and Dalian are in a leading position in the construction of digital economic infrastructure. These two cities have relatively complete 5G network coverage, data centers, and cloud computing platforms, providing a solid foundation for the development of the digital economy. Liaoning Mobile has invested a large amount of funds in the construction of new infrastructure in Dalian and Shenyang, building 10000 5G base stations and achieving full coverage in urban areas and key towns. At the same time, Shenyang and Dalian rely on their good industrial foundation and technological strength, and the digital economy industry has a large scale, covering multiple fields such as electronic information manufacturing and digital creativity. These cities have a group of highly competitive digital economy enterprises, injecting new momentum into regional economic development. In contrast, other cities in Liaoning Province are relatively lagging behind in the construction of digital economy infrastructure. The network coverage and data center construction in some regions are still unable to meet the needs of digital economy development. The scale of the digital economy industry is relatively small and has not yet formed a competitive industrial cluster.

3.3. The Process of Enterprise Digital Transformation is Slow

In recent years, Liaoning Province has actively responded to the national call to accelerate the development of the digital economy, set the construction of a digital Liaoning and a strong province of intelligent manufacturing as the development goal, and continued to make efforts in industrial Internet, manufacturing digital transformation and other aspects. However, compared to some advanced regions, the digital transformation process of enterprises in Liaoning Province is relatively slow. Some enterprises have insufficient awareness of the importance and urgency of digital transformation, and lack the willingness and motivation to actively transform. This leads to insufficient investment in digital transformation by enterprises, making it difficult to form effective transformation paths and strategies. Digital transformation requires advanced technological support and significant financial investment.

However, some small and medium-sized enterprises lack the technological and financial capabilities to bear the high costs of digital transformation. In addition, some companies lack clear direction and judgment when choosing digital technology, which can easily lead to the misconception of blindly following the trend or duplicating construction.

3.4. Shortage of Digital Professionals

With the vigorous development of digital economy in Liaoning Province, the demand for digital technology talents in various industries has increased sharply, especially in the fields of information technology services, industrial Internet, intelligent manufacturing, etc. Although various universities and vocational schools in Liaoning Province have strengthened the training of digital talents, the scale and quality of training still cannot meet the rapid growth demand of the market. The growth of the number of digital technology talents has almost stagnated, leading to a continuous expansion of the supply-demand gap. Digital technology talents are often more inclined to flow to economically developed regions with more opportunities[2]. This has led to a relative abundance of digital technology talents in these regions, while other areas are facing a shortage of talent. Due to various factors such as economy and culture, Liaoning is facing a serious problem of talent loss. Many college graduates choose to work in developed areas, resulting in a shortage of local talent reserves. Although Liaoning has taken a series of measures to attract talents, due to limitations in working environment, salary and development opportunities, there is a lack of motivation and a small number of foreign talents. Universities and vocational colleges are out of touch with market demand in the cultivation of digital professionals, and their curriculum and teaching content are not updated in a timely manner, making it difficult to cultivate high-quality talents that meet market demand.

4. Liaoning Province Promotes the Development Path of Digital Industrialization and Industrial Digitization Linkage

4.1. Improve the System of digital Industrialization and Industrial Digitalization Linkage Development

Firstly, strengthen top-level design. By planning and clarifying the development goals and phased tasks of the digital economy, we ensure that all work is carried out in an orderly manner. Develop and implement a series of policy measures to support digital industrialization and industrial digitization development, including fiscal subsidies, tax incentives, low interest loans, etc., to reduce the cost of enterprise transformation and stimulate market vitality. Secondly, establish a comprehensive coordination mechanism. Establish a leading group for the construction of Digital Liaoning, led by the main leaders of the provincial government, to coordinate and promote the construction of Digital Liaoning, and ensure the effective implementation of various policies and measures. Establish specialized agencies such as the Provincial Big Data Bureau to manage data resources throughout the province. At the same time, establish a Digital Liaoning Construction Expert Advisory Committee and an expert think tank to improve the scientificity of decision-making. Finally, strengthen monitoring, evaluation, and adjustment optimization. Establish a sound monitoring and evaluation system for the digital economy, and regularly monitor and evaluate the progress of digital industrialization and industrial digitization linkage development.

4.2. Strengthen the Construction of Digital Economy Infrastructure and Cultivate Digital Economy Industry Clusters

Digital industrialization and industrial digitization are the core of the digital economy, and they complement and promote each other. The advancement of digital technology has promoted the development of digital industrialization and increased the scale of digital industrialization. Therefore, firstly, we should increase investment in the construction of digital economic

infrastructure in underdeveloped areas, improve network coverage and data transmission speed, build data centers and cloud computing platforms, and provide strong support for the development of the digital economy. Secondly, cultivate clusters of digital economy industries. Based on the industrial foundation and resource advantages of various regions, cultivate competitive digital economy industry clusters, and promote the deep integration and development of digital economy and real economy. Finally, promote the application scope of the digital economy. Actively promote the application of digital technology in government governance, urban management, industrial production, agricultural planting and other fields, and enhance the application level and popularization rate of the digital economy.

4.3. Create a Favorable Transformation Environment and Further Promote the Digital Transformation of Enterprises

Firstly, the government should introduce more policy measures to support the digital transformation of enterprises, including financial subsidies, tax incentives, etc., to reduce the cost of enterprise transformation and stimulate the motivation for enterprise transformation. At the same time, improve the public service system. Improve public service platforms and provide common technologies, talent training, and other public services required for digital transformation. Secondly, encourage enterprises to increase their R&D investment, introduce and digest advanced digital technologies from both domestic and foreign sources, and promote technological innovation and application[3]. At the same time, we support the development of third-party digital service providers and provide professional digital solutions for enterprises. You can choose a group of enterprises with good basic conditions and outstanding transformation effects as benchmark demonstrations. Strengthen the promotion and publicity of benchmark enterprises through case sharing and other forms, and guide more enterprises to learn and draw on successful experiences. Finally, in the process of promoting digital transformation of enterprises, it is necessary to attach great importance to data security protection. Establish and improve data security management and technical protection systems, strengthen the protection and management of enterprise data resources, and prevent security incidents such as data leakage and abuse.

4.4. Increase the Cultivation and Introduction of Digital Talents

Firstly, establish a comprehensive digital talent training system, including course design, practical activities, etc., to ensure the practicality and cutting-edge nature of the training content. Encourage internal employees to participate in training and learning related to digital transformation, in order to enhance their digital literacy and skill level. At the same time, establish a promotion mechanism to stimulate employees' motivation for learning and development. Strengthen cooperation with universities and vocational schools to jointly cultivate digital talents that meet the needs of enterprises. Through internships, practical training, and other means, students can be exposed to and understand the actual needs of digital transformation in enterprises in advance. Secondly, a specialized talent introduction plan should be established for high-level digital talents, providing more favorable benefits and conditions such as housing subsidies and children's education. Provide a broad development platform and promotion opportunities for digital talents, allowing them to have more growth space and opportunities to realize their self-worth in the enterprise.

5. Conclusion

Overall, with the acceleration of global digitalization, the digital economy has become the core engine driving high-quality economic and social development. As an important part of the old industrial base in Northeast China, Liaoning Province's promotion of digital industrialization and industrial digitization linkage development is not only a necessary path to achieve

economic transformation and upgrading, but also a key measure to respond to the national strategic deployment of "building a modern industrial system". With the deepening of digital transformation, traditional industries will radiate new vitality and energy, emerging industries will continue to emerge and grow rapidly, and the digital economy and the real economy will achieve deep integration, jointly promoting the high-quality development of Liaoning Province's economy and society.

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