

Research on the Digital Development Path of Advanced Manufacturing Industry in Wenzhou

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Abstract: The ability of independent innovation is the foundation of sustainable innovation of industrial technology, and plays an important role in improving the technological innovation ability of advanced manufacturing. It analyzes the development status of technological innovation in Wenzhou's advanced manufacturing industry and puts forward the improvement path of independent innovation ability of advanced manufacturing industry, which has certain theoretical and practical significance for improving the technological innovation level of Wenzhou's advanced manufacturing industry, accelerating the upgrading of industrial structure, and enhancing the international competitiveness of the industry. The development of advanced manufacturing industry in Wenzhou is underway, but compared with the surrounding cities, there are still shortcomings in the development of advanced manufacturing industry in Wenzhou. According to this paper, the digital development opportunities of Wenzhou's advanced manufacturing industry are expounded, and then the existing problems of the digital development of Wenzhou's advanced manufacturing industry from the perspective of integration are analyzed according to the current development status, and a targeted path selection is provided, aiming to promote the better and faster development of Wenzhou's advanced manufacturing industry and accelerate the high-quality economic development of Wenzhou.

Keywords: Advanced manufacturing, Digitization, Development path.

1. Introduction

The executive meeting of the State Council deliberated and adopted the opinions on accelerating the development of advanced manufacturing clusters. The meeting emphasized that the development of advanced manufacturing clusters is an important starting point for promoting the industry towards the middle and high end, improving the resilience and safety level of the industrial chain and supply chain, and is conducive to forming scale effects and competitive advantages such as collaborative innovation, talent agglomeration, cost reduction and efficiency improvement. The importance of advanced manufacturing clusters has become increasingly prominent, and the development of advanced manufacturing clusters in various regions has also attracted much attention from the outside world. According to the list of 45 national advanced manufacturing clusters previously released by the Ministry of Industry and Information Technology, the Yangtze River Delta region occupies 18 seats, ranking first among all regions.

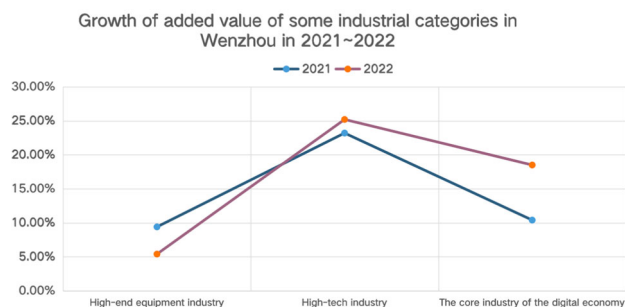
Not only that, many places in the Yangtze River Delta region are also continuing to compete for the "C position" of advanced manufacturing clusters. Wenzhou has promoted the regional integration development of the Yangtze River Delta, and formulated the "Wenzhou Action Plan for the Construction of Zhejiang "415X" Advanced Manufacturing Cluster (2023-2027)" (hereinafter referred to as the "Action Plan"), aiming to deeply implement the provincial "415X" advanced manufacturing cluster cultivation project, accelerate the industrial revitalization of Wenzhou, and promote the high-quality development of the city's manufacturing industry. According to the Action Plan, in the next five years, Wenzhou will implement space vacancy actions, recruitment and strengthening actions, enterprise excellence and strengthening actions, quality improvement actions, digital empowerment actions and innovation and

strong industry actions. Implemented in specific measures, including rectifying inefficient industrial land and old parks, building high-level industrial platforms, promoting industrial collaborative layout, planning and attracting major projects, implementing digital energy-saving transformation of thousands of enterprises, building a "specialized, specialized and new" city, promoting the international development of enterprises, improving the quality level of manufacturing, strengthening the brand construction of "Made in Zhejiang", accelerating the innovation and development of enterprise standards, building a high-value intellectual property cultivation platform, accelerating the construction and application of "industrial brains" in subdivided industries, and promoting the digital transformation of enterprises. Accelerate the development of the industrial Internet, strengthen key core technology research, implement industrial infrastructure reengineering projects, promote the transformation of major scientific and technological achievements, and build major innovation carriers.

2. Development Status of Advanced Manufacturing Industry in Wenzhou

Manufacturing is the foundation of Wenzhou. In 2022, the manufacturing industry of the core industry of digital economy in the industries above designated size in Wenzhou will develop rapidly, and the high-tech industry will also grow significantly in 2022. However, as shown in Figure 1, the growth rate is still the highest in the manufacturing industry, the core industry of the digital economy, and the development of advanced manufacturing has achieved remarkable results. Wenzhou is located in East China, southeast of Zhejiang, with a land area of 12,110 square kilometers. According to the Action Plan, it aims to deeply implement the "415X" advanced manufacturing cluster cultivation project in

Zhejiang Province, accelerate the industrial revitalization of Wenzhou, and promote the high-quality development of Wenzhou's advanced manufacturing industry. By 2025, Wenzhou will build two trillion-yuan industrial cluster systems, one is five traditional pillar industries such as electrical, footwear, pump and valve, auto parts, and clothing, and the other is five emerging leading industries such as digital economy, new materials, intelligent equipment, new energy, and life and health.



Source: Wenzhou Municipal Bureau of Statistics.

2.1. Introduced a number of advanced manufacturing enterprises

In the past "Thirteenth Five-Year" period advanced manufacturing industry accelerated development, especially the optoelectronic industry, Wenzhou municipal government attracted a large number of major industrial projects and put into production, such as Yiwu has attracted Huacan Optoelectronics and other 8 provincial major projects, with a total investment of more than 26 billion yuan, forming the whole industrial chain of LED chip design, packaging, epitaxy, LED lamps, and gradually expanding the optoelectronic industry cluster. At the same time, after introducing Leapmotor Motor Co., Ltd. to Wenzhou in 2017, it established a relevant technology research and development department to achieve technology self-research and development, becoming the only enterprise with global self-research and self-manufacturing capabilities among the new domestic automakers.

2.2. The digital transformation of enterprises has achieved remarkable results

At present, Wenzhou's digital economy is developing rapidly and has become one of the important pillars of Wenzhou's economic development. Wenzhou enterprises actively explore digital transformation and upgrading, and continuously launch various digital products and services, such as e-commerce, intelligent manufacturing, Internet of Things, big data, artificial intelligence, etc. At the same time, the Wenzhou government has also actively promoted the development of the digital economy and increased its support for the digital economy through policy support and capital investment. In 2022, the added value of the core industries of Wenzhou's digital economy will be 61.34 billion yuan, ranking fourth in the province, and the layout of the development of the digital economy of "one corridor, three districts and three bases" has been basically completed, especially the highlights of Yueqing Electric Appliance and Yongjia pump valve industry are outstanding, and they are in a leading position in the country. The digital economy has brought profound changes to Wenzhou's economy. First of all, the digital economy promotes the transformation and

upgrading of the manufacturing industry. Second, the digital economy has improved the consumer environment. The development of the digital economy has provided consumers with more convenient, safe and fast online consumption methods, which has greatly improved consumers' shopping experience. Finally, the digital economy has improved the quality of cities. The development of the digital economy has made urban management more intelligent and efficient, providing a better living environment for urban residents.

2.3. Solid infrastructure conditions

At a time when the wave of "new infrastructure" is sweeping, 5G is rapidly integrating into thousands of industries, and intelligent manufacturing, smart logistics, smart medical care, smart transportation, etc. are constantly emerging, becoming a new driving force to support high-quality economic and social development. By 2023, Wenzhou will have opened a total of 20,000 5G base stations. At the same time, due to the high energy consumption required by the advanced manufacturing industry in the production process, in order to solve the problems of inaccurate energy consumption data of enterprises, unscientific energy consumption control and carbon reduction services, and promote the development of green, low-carbon and environmental protection to achieve green manufacturing, Wenzhou has launched online software for enterprise energy use, which can view energy consumption data in real time to understand the energy consumption of enterprises, and once it exceeds the standard, it can also issue early warning instructions, timely control of energy consumption usage, and build a green ecological environment.

3. Existing Problems in The Digital Development of Advanced Manufacturing Industry in Wenzhou

3.1. The cultivation of leading enterprises is insufficient

High-quality leading enterprises such as Tsingshan Holdings and Chint Group are the key forces supporting the construction of global advanced manufacturing bases, high-quality development and common prosperity demonstration zones. However, in the investigation stage of enterprises, it is not difficult to find that local enterprises in Wenzhou are still mainly small and medium-sized enterprises, and cannot be cultivated into leading enterprises. Recently, the Zhejiang Provincial Leading Group for Industrial Transformation and Upgrading announced that there are 6 Wenzhou in the third batch of "Eagle Action" cultivation enterprises, namely Zhengtai Group Co., Ltd., Delixi Group Co., Ltd., People's Electrical Appliance Group Co., Ltd., Huaфон Group Co., Ltd., Semir Group Co., Ltd., Ren Group Co., Ltd. and other 6 enterprises were selected, ranking fourth in the province. It can be seen that there are not many leading enterprises in Wenzhou, and enterprises with scientific and technological content and competitiveness are even rarer, and a large number of small and medium-sized enterprises are at the bottom of the industrial chain, so Wenzhou has also introduced corresponding policies to attract enterprises that enjoy a certain degree of popularity in China to settle in, build industrial clusters, and rely on leading enterprises to drive the development of local small and medium-sized enterprises.

And there are still many traditional manufacturing enterprises in Wenzhou, and they have not well integrated digital intelligent manufacturing into it in the process of coping with digital transformation, resulting in some traditional manufacturing enterprises have been trial and error, and then leading enterprises are needed to take the lead, which can better transfer experience and technology to some traditional manufacturing enterprises to help them implement digital transformation, and improve the integration of manufacturing and digital economy.

3.2. The level of research and development needs to be improved

When visiting manufacturing enterprises in Wenzhou, the management of many enterprises mentioned that the level of scientific and technological research and development of their own enterprises is relatively backward, and some still rely on foreign technology at the core technology level, and there is no way to achieve complete self-research, and the cost in product research and development is relatively large. This is also one of the current pain points in Wenzhou. Some enterprises are seriously affected by the epidemic and are on the verge of bankruptcy, so the digital transformation and technology research and development innovation of enterprises have become the biggest problems of such enterprises, such enterprises have no confidence in trial and error, and are afraid of trying to cause the enterprise to go bankrupt directly and the cost of technology research and development is too high, and the capital chain is easy to break. At present, Wenzhou has weak basic scientific research capabilities, key core technology research capabilities, achievement transformation and industrialization capabilities in key areas of key industries. There is a lack of high-level innovation platform layout such as technology R&D laboratories and manufacturing innovation centers, and the construction of new R&D institutions is relatively lagging behind, and the energy level and number of innovation platforms are far behind those of advanced cities in the province.

3.3. Talent subsidies need to be improved

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behind, and the energy level and number of innovation platforms are far behind those of advanced cities in the province.

4. Suggestions for the Transformation and Upgrading of Wenzhou's Advanced Manufacturing Industry

4.1. Accelerate the cultivation of advanced manufacturing clusters

Wenzhou should continue to deeply implement the special action of "cage for bird, phoenix nirvana", and strengthen the whole chain cultivation path of "technology-product-enterprise-industrial chain-industrial cluster". The government should promote the digital upgrading of traditional manufacturing and form a number of classic industries and fashion industries with Wenzhou characteristics and recognition. At the same time, vigorously support a number of leading enterprises with strong leading drive, such as in the solar photovoltaic industry, relying on leading enterprises such as Hengdian Dongci, Aixu Solar, Trina Solar, JA Technology, etc., accelerate the layout of a number of academician workstations and optoelectronic technology research centers in the photovoltaic field, actively research and develop, accelerate breakthroughs in core technologies, strengthen brand building, grow into industry benchmarks, and drive the common development of small and medium-sized enterprises.

4.2. Strengthen the internal management of manufacturing enterprises

In the survey of manufacturing enterprises in Wenzhou, it was found that some enterprises had contradictions within the enterprise, some senior management and middle level of enterprises had disagreements, and most of them managed family-owned enterprises. Leaders are easy to stick to their thinking, consider the long-term development of the enterprise, and are unwilling to innovate boldly; The middle management of enterprises hopes to step on the green space of the digital economy and create a new model of enterprise development. Therefore, it is necessary to strengthen the management of enterprise content and achieve unity of opinion in order to accelerate the development of enterprises. For the senior management of the enterprise, it is necessary to dare to try, dare to try and make mistakes within a controllable range, listen to the ideas and opinions of the core members of the enterprise, strengthen communication, and express the high-level ideas on the development of the enterprise and the concerns of the middle management; The middle level of the enterprise should strengthen communication, understand the concerns of the senior management and try to dispel the concerns, and strengthen the management of employees to achieve a unified heart, so as to promote the faster and better development of the digitalization of Wenzhou's advanced manufacturing industry.

4.3. Accelerate the development of local skilled personnel

Without the gathering of high-quality manufacturing talents, there will be no high-quality manufacturing. In order to rapidly promote the integration of Wenzhou's advanced manufacturing industry and digital economy, in addition to increasing talent subsidies to recruit talents nationwide, it is

also necessary to accelerate the cultivation of local talents. In terms of talent training, enterprises should actively connect with all colleges and universities in Wenzhou, rely on the job needs of enterprises to discuss talent training plans with universities, and promote the construction of talent training training bases to ensure that theoretical knowledge is learned in school, field practice in enterprises, and continuously provide talents for enterprises, so as to better promote the digital integration of advanced manufacturing in Wenzhou. Secondly, encourage employees of existing advanced manufacturing enterprises to participate in relevant skills training to improve the digital level of employees; At the government level, through the Bureau of Human Resources and Social Security, skills training related to advanced manufacturing or the digital economy is organized to encourage people in the community to participate in the training and increase the talent pool.

4.4. Promote the introduction of corresponding government policies

In the list of the top 100 cities in advanced manufacturing in 2021, Wenzhou only ranked 31st, and it is still in the forefront of the country. However, there is still a certain gap compared with Hangzhou, Ningbo and Shaoxing in the province. Overall, the top 100 advanced manufacturing enterprises in Zhejiang Province are located in terms of regional distribution: 35 are located in Hangzhou, 28 are located in Ningbo, 12 are located in Shaoxing, and only 7 are located in Wenzhou. At present, Wenzhou has problems such as difficulties in attracting investment and the development and transformation of small and medium-sized enterprises, and in order to alleviate such problems to a certain extent, the government should increase policy support. In terms of attracting and attracting strength, the Wenzhou municipal government should deepen the introduction of corresponding relief measures, such as site rent reduction and tax reduction, etc., to attract major manufacturing projects to Wenzhou. For local MSMEs, the government should introduce corresponding support policies to help MSMEs in their digital transformation and reduce their risks in the transformation process. At the same time, the government can also set up a team of expert consultants related to the digital economy to provide point-to-point and one-to-one guidance services for the difficulties encountered by manufacturing enterprises in the process of digital transformation, giving enterprises the courage to dare to try digital transformation and accelerate the

integration of manufacturing and digital economy.

5. Summary

Although the digital transformation of Wenzhou's advanced manufacturing industry has begun to take shape, there is still a long way to go for future development. According to the existing problems of the digital development of Wenzhou's advanced manufacturing industry from the perspective of integration, this paper puts forward the corresponding development path choices to help Wenzhou better develop the manufacturing industry in the future. As long as the enterprise unswervingly takes the road of innovation and independently develops technology; The government's strong support and implementation of policies, including attracting leading enterprises, supporting small and medium-sized enterprises, recruiting and nurturing talents, etc., will surely improve the integration of the digital economy and manufacturing industry to a certain extent, and accelerate the high-quality economic development of Wenzhou.

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