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The Integrated Development of Digital Economy and China's Textile Manufacturing Industry: Based on the Experience of Shaoxing, Zhejiang Province

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Abstract: *Under the background of digital economy driving the digital transformation of global industries, Keqiao District of Shaoxing City, as the largest textile base in China with a 40-year history of light textile development, is also facing the bottleneck of transformation and upgrading. It is worth discussing how to promote the digital and intelligent transformation of traditional industries and put forward the path suitable for its transformation and upgrading. Based on the textile industry in Shaoxing, this paper analyzes the development status of traditional textile manufacturing industry in Shaoxing, and puts forward some thoughts and countermeasures from the aspects of green ecology, science and technology-driven innovation and talent training.*

Keywords: *Digital economy, Textile manufacturing, Shaoxing, Digital transformation*

1. Introduction

Digital economy is a new driving force for global economic growth. It is a challenge for the traditional manufacturing industry to use digital transformation to accelerate industrial upgrading and stabilize and improve industrial chain. As one of China's 100-billion-level textile industry clusters, Shaoxing Keqiao is making every effort to build itself into the "The World's Fashion Textile Capital", and developing towards the direction of intelligence, high-end and internationalization. It is of far-reaching significance to explore the difficulties faced by Shaoxing textile manufacturing industry in the process of digital transformation and development, put forward countermeasures to solve the problems, comprehensively promote the transformation and upgrading of traditional manufacturing industry, and promote China's industry to the high end of the global value chain.

2. Literature Review

Research on the digital economy in academia started early. In 1955, Don Tapsko first put forwaed the concept of digital economy in "Digital Economy", which was quoted by Japanese academic circles in 1997. In the "new economic" phenomena in 1998 and the financial crisis in 2008, the digital economy is gradually become an important driving force of the global economic recovery. The discussion of digital economy in western academic circles mainly embodied in two aspects: one is the connotation of the digital economy. British scholar Miller & Wilsdon(2001) pointed out that digital economy has four representatives, namely technological revolution, innovative behavior, sustainable development and equality. Kim(2002), an American scholar, analyzed and pointed out from the market point of view that digital economy is a new economic form that enables goods and services to be traded in digital form. Kling & Lamb(1999) thinks that digital economy is an independent economic sector that completely depends on digital technology from manufacturing, sales to supply of goods and services, rather than just an economic form. Anothe is to analyze the internal mechanism of the impact of the development of digital economy on industrial structure. Manyika & Roxburg(2011) made a comparative study on the productivity brought by digital economy, and found that digital economy can accelerate the transformation and upgrading of basic industries, thus enabling them to engage in full value chain business, which has a greater influence on small and medium-sized enterprises with higher productivity. Astor, et al. (2016) pointed out in the research of digital competitiveness that although small and medium-sized enterprises are facing unprecedented opportunities for development, their digital competitive position is far inferior to that of large enterprises in the manufacturing field. At the same time, because the gap between urban and rural areas still exists significantly in the future IT infrastructure construction,

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the innovation-oriented enterprises using digital technology will continue to concentrate in urban areas. Curran(2011) studied some classic research achievements in the field of industrial integration, and pointed out that industrial integration needs to go through the evolution process of scientific research integration, technology integration and market integration, which provides a theoretical basis for studying industrial integration under the background of digital economy.

Chinese scholars' research on the integration of digital economy and traditional industries mainly focuses on three aspects, inclduing the current situation of digital economy development in China, the path of digital development of Chinese enterprises and the analysis of difficulties in the process of digital development in China. Through the relevant research of Chinese scholars on the integration and development of digital economy and traditional industries, it could be concluded that China has the following problems in the digital field. First of all, China's digital economy has problems such as high market access threshold, unsuitable system and mechanism, etc. It is also not dominat in the development of big data, cloud computing, Internet of things, service networking, simulation analysis, industrial software, digital control, virtual reality and other technical aspects. Secondly, as the digital economy model is a new economic model, there is no complete development reference system at present, and the country and enterprises have not formulated the specific paths for the development of the digital economy. Moreover, most enterprises in China have problems related to low digital level, difficult evolution of network and intelligence.

3. The existing problems of shaoxing textile manufacturing industry

3.1 Different paces of enterprise digital transformation

According to data, as of 2019, the scale of textile industry has accounted for 28% of Shaoxing's total industrial economy, accounting for about 1/3 of Zhejiang's total textile industry, ranking first in the country in terms of industrial scale and volume. However, behind the huge scale benefits, there are only 1,862 textile enterprises above designated size (there are nearly 70,000 textile enterprises and household industrial units in the whole city). It can be seen that small and medium-sized enterprises still account for a relatively large proportion in Shaoxing. Compared with large enterprises, small and medium-sized enterprises often have problems such as backward production technology, weak awareness of independent innovation, long-term reliance on low-cost labor to obtain meagre profits, and generally low digitalization level. Although most enterprises have keenly captured the great potential of digital transformation, due to the limitations of capital and available resources, intelligent production line transformation is often impossible, and intelligent manufacturing is still difficult to achieve. The impact of COVID-19 epidemic has further increased the instability of enterprise development, especially for enterprises that rely on processing trade for export, and the shortage of funds has seriously hindered their comprehensive digital transformation.

3.2 Lack of awareness of independent innovation in enterprises

For a long time, information technology innovation has become a key factor for enterprises to survive and an important weight for participating in international competition. According to the achievements of China's national modern textile manufacturing cluster creation in 2020, Shaoxing's textile industry has been at the forefront of the country in terms of innovation capabilities and digital intelligence empowerment, but the problem of technological innovation is still severe. For example, most of the key components of textile manufacturing need to be imported. The textile equipment of enterprises is backward, and there are obvious deficiencies in manufacturing data collection, information fusion, intelligent execution, and intelligent operation. In addition, the traditional technological thinking that has stalled during the transformation process has become the most restrictive factor in the digital transformation of the textile industry. Enterprise managers and/or practitioners are limited by academic qualifications, funds and other reasons, and the awareness of independent innovation is often scarce, and most of them stay at the level of imitative innovation. The lack of core competitiveness hinders the development of enterprises.

3.3 Structural shortage of digital talent

With the upsurge of digital transformation and upgrading of traditional industries, the demand for compound talents with both digital thinking and basic knowledge of the industry is increasing. In addition, the overall informatization level of China's manufacturing enterprises is uneven, with different

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development modes and paths. It is unrealistic to mechanically copy the experience of other successful transformation enterprises. Professionals are required to use professional knowledge and theoretical methods to analyze the overall situation and then propose transformation and upgrading paths, precise regulation, follow-up and summary plans.However, according to media reports, many garment enterprises generally reflect the lack of talents in advanced garment, foreign trade, technical management and chemical research and development. At the same time, compared with foreign textile developed countries and regions, due to geographical limitations, Shaoxing textile enterprises are often less attractive to high-level digital talents. In the long run, there is a serious gap in digital talents, resulting in a structural shortage.

4. Suggestions on the Integration Development of Digital Economy and Shaoxing Textile Manufacturing Industry

4.1 Strengthen policy support and introduce innovative models of financial services

The scale of China's digital economic added value increased from 2.6 trillion yuan in 2005 to 35.8 trillion yuan in 2019, with a compound growth rate of 20.6%, and the proportion of digital economic added value in GDP increased year by year. Since 2015, zhejiang province has successively issued the Action Plan for Accelerating the Deveolopment of Intelligent Manufacturing (2015-2017), the Zhejiang Action Plan for Made in China 2025, and the Action Plan for Comprehensively Reforming and Upgrading Traditional Manufacturing Industry in Zhejiang Province (2017-2020), which regards intelligent manufacturing as the main direction of industrial development and puts forward the construction strategy of "three strong and one manufacturing", and promotes the integration and application of "Robot+","internet plus", "Standardization+"and "Big Data+"in traditional manufacturing fields. At the same time, in September 2017, the "Intelligent Manufacturing Expert Committee of Zhejiang Province" was established to help traditional enterprises to develop into high-tech enterprises. In addition to providing policy and technical support, the financial issue is also worth of attention, especially the support for small and medium-sized enterprises and the threshold of application should be adjusted. Therefore, the zhejiang provincial government coordinated with local government, banks, service providers, implmenters, fund institutions and other entities, aiming at eight financial service innovation modes, such as intelligent equipment leasing financing, intelligent equipment outsourcing financing, intelligent manufacturing funds, and intelligent manufacturing enterprise liquidity services, which solved the problems of insufficient funds, slow return of funds, and great pressure on early investment for enterprises. Xinchang Rifa Textile Machinery purchased intelligent equipment with the help of credit made by Xintianyuan, an intellectual reform enterprise. Under the support and guidance of the new generation of digital technology, with data as the key element and value release as the core, it digitalized, upgraded, transformed and recreated all the elements in the upstream and downstream of the industrial chain, which increased the production capacity by 30%, saved the labor cost by 50% and increased the sales by more than 2 million yuan.

4.2 Give full play to the advantages of resource agglomeration and jointly build a digital textile community

In recent years, the digitalization process has penetrated into all walks of life. Food, clothing, housing, travel, shopping and entertainment, medical education, which surround all aspects of people's daily life, are immersed in the tremendous changes brought by big data, hoping to inject new energy into digital transformation and realize lane change and overtaking. According to China Internet Index Report (2018) compiled by Tencent Research Institute, in 2018, the growth rate of digital China index in eastern China was 84.64%, that in western China was 68.88%, and that in central China was 79.69%, showing that the growth rate of digital China index in eastern China was the highest. At the same time, the cluster effect also appears in the Digital China Index, especially in the Yangtze River Delta urban agglomeration, Pearl River Delta urban agglomeration, Beijing-Tianjin-Hebei urban agglomeration and other large urban agglomerations.Similarly, the leading role of large-scale urban agglomeration can be applied to industrial clusters. Taking Ke Qiao, Shaoxing as an example, the textile industry has a long history, a deep foundation and a large number of enterprises. As the permanent host of the World Cloth Merchants Conference, the world's industry elites gather here every year, which has the outstanding advantages of integrating the three major advantages of enterprises, industries and society. Therefore, Keqiao should give full play to the advantages of resource agglomeration and build a Digital Textile Community. The Digital Textile Community refers to the establishment of platforms, data communication, and operation

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coordination to realize the interconnection, interdependence and mutual regeneration of international enterprises, and promote the transformation and upgrading of Shaoxing's textile industry to research and development, creative design and brand creation and marketing.

In 2015, Chinese President Xi visited Imperial College London during his visit to the UK. When visiting the Imperial College London Institute of Data Science at Imperial College London, the institute presented a Scottish wool shawl made by big data calculation to the accompanying Ms. Peng. The designer first collected data from a large number of photos, referred to the past wearing occasions and environmental references, then determined the wearing style by the proportion of characters and the color of the clothing, and finally rendered the shawl design on the 3D animation model based on Ms. Peng's data, and made ready-made garments after repeated adjustments, which lasted more than one month. Traditional clothing customization has a long cycle, needs to be personally tailored, and the price is high. Big data realizes "make clothes before you see them", which no longer depends on customers to make their own measurements, and the production cycle is short. If the Digital Textile Community can be built, these latest digital systems can be better shared in the garment customization process of cooperative enterprises, which will bring great convenience to enterprises and the public.

4.3 Cultivate digital literacy talents and promote the construction of an industrial technology innovation system

The development and progress of science and technology will definitely change the future trend and pattern, improve the efficiency of social work, and cause the reshaping of employment structure. According to the data of the World Economic Forum, 65% of the children attending primary school will eventually take up new occupations that do not exist yet. Digital economy is the fastest growing field in China, and the shortage of professional talents has always been a thorny problem for enterprises. With the further popularization and evolution of intelligent manufacturing, the demand for high-end talents has greatly increased, which will create many new jobs, such as robot controllers, data scientists and automation experts. For some single specific fields, jobs with repetitive work thinking mode will be replaced by robots.Some developed countries have listed digital literacy as the basic quality requirement of citizens. For example, the United States regards digital literacy as one of the three essential skills in the 21st century, while the United Kingdom regards digital literacy as the core literacy of citizens, emphasizing the digital literacy framework including five literacy domains, including information and identification, communication domain, content creation domain, security awareness domain and problem solving domain. Therefore, the change of employment structure and social demand for talents requires speeding up the reform of higher education, social security and other fields, doing well related vocational training, carrying out school-enterprise cooperation, delivering digital literacy talents for enterprises, and promoting the construction of industrial technology innovation system.

5. Conclusion

The advent of the new economic era has brought more severe challenges to China's traditional industries, and the transformation and upgrading of traditional industries has become the urgent task of China's economic development. Considering that textile industry is a traditional pillar industry in China and Shaoxing is a textile market, taking Shaoxing textile manufacturing industry as the research object, it is in line with the current digital transformation background of enterprises, and has certain times and novelty. At present, China actively promotes the digital transformation and upgrading of traditional industries, but the research on the integration and development of digital and traditional manufacturing industry has not been systematic. It is still necessary to systematically sort out the necessary problems encountered in the practice process, and choose the correct digital production chain and its own operation mode and insist on it, so as to truly realize the digital transformation.

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