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Digital Transformation and High-Quality Manufacturing Development in Anhui Province

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ABSTRACT

Digital economy and digital technology have become the key drivers of manufacturing development and upgrading transformation. Digital transformation is an important path and inevitable choice for manufacturing industry to achieve high-quality development. This paper analyzes the development trend of manufacturing industry in Anhui Province in the context of digital transformation in recent years, and discusses the challenges faced by manufacturing enterprises in this transformation process. It puts forward corresponding strategic suggestions for the digital transformation of manufacturing enterprises in Anhui Province, in order to promote the manufacturing enterprises to high-quality development.

KEYWORDS

Digital Transformation; Manufacturing Industry; High-Quality Development; Anhui Province

1. INTRODUCTION

With the continuous progress of the global economic structure and technological revolution, digital transformation has become a core driving force in promoting the high-quality development of manufacturing enterprises. In the face of the decline in international economic cycle momentum and the instability of the global market, the Party's 20th National Congress explicitly emphasized the need to firmly focus on the real economy in economic development, accelerate the building of a strong manufacturing country, a strong network country, and digital China, and promote the development of manufacturing towards high-end, intelligent, and green. As an emerging force of the fourth industrial revolution, digitization is accelerating major changes in manufacturing production methods. It has become an effective tool for promoting efficient collaboration and optimal resource allocation in industrial and supply chains. It is an important way for manufacturing to develop towards high quality, and it is also an urgent need for Anhui Province's manufacturing industry to improve quality, expand production, and improve efficiency. As the economic pillar of a modern country, the high-quality development of manufacturing is directly related to the future competitiveness of the country. Digital transformation can help enterprises better meet market demands, achieve personalized customization, and sustainable green development.

Digital transformation is not only a necessary condition for manufacturing enterprises to achieve high-quality development, but also a basic support for building a new development model. Looking to the future, mastering and utilizing the power of digitalization will help China's manufacturing secure an advantageous position in global competition, meet the huge domestic demand market, and at the same time promote a broader and deeper development of China's economy.

2. LITERATURE REVIEW

The rise of digital transformation and the high-quality development of manufacturing enterprises have aroused keen interest among scholars at home and abroad. They have discussed this topic from multiple perspectives, forming certain research achievements, which are mainly reflected in the following three aspects. First, research on digital transformation. The study of digital transformation primarily focuses on enterprise innovation, production efficiency, corporate performance, and corporate financing activities. Matarazzo M et al. (2021) pointed out that digital transformation has changed the business models of enterprises, generating new marketing channels and methods, thereby enhancing the performance level of enterprises. Bauer W et al. (2015) showed that digital transformation helps improve corporate agility, thereby increasing production efficiency. In addition, Che Dexin et al. (2021) found that digital transformation can reduce the financing costs of enterprises; while Huang Dayu et al. (2023) discovered that digital transformation significantly enhances the risk-taking level of enterprises and maintains financial stability. Second, research on the high-quality development of manufacturing enterprises. The research on the high-quality development of manufacturing enterprises mainly focuses on the following aspects: One is the strategy and measures for the high-quality development of manufacturing. Shang Huiyong et al. (2019) believe that it is necessary to seize the major opportunities for manufacturing transformation and surpass the manufacturing development level of developed countries on the basis of consolidating the foundation of China's manufacturing development. The second is the changing trend of high-quality development of manufacturing. Wang Boya (2021) believes that to achieve high-quality development of manufacturing, it needs to shift from single-wheel drive of technological level improvement to dual-wheel drive of technological level and technical efficiency improvement. The third is the measurement of high-quality development level of manufacturing and its temporal and spatial evolution. Lin Chunyan et al. (2023), based on constructing an evaluation index system for high-quality development of manufacturing, use a two-stage entropy value method and a time-series weighted average operator for static and dynamic measurements, analyze its temporal and spatial evolutionary characteristics; and with the help of Dagum Gini coefficient and its decomposition method and Kernel density estimation method to depict the temporal and spatial difference evolution of the four regions. Fourth, factors affecting the high-quality development of manufacturing, mainly focused on perspectives such as the digital economy, digital transformation, application of artificial intelligence technology, and industrial agglomeration. Third, research on the relationship between the two. Regarding digital transformation and high-quality development of manufacturing enterprises, Qi Yudong and Liu Huanhuan (2020) pointed out that the implementation of digital transformation strategy by enterprises can promote the high-quality development of manufacturing, the key lies in giving full play to the effective allocation of data elements by digital technology to enhance industrial productivity; Zhao Chenyu et al. (2021) elaborated in detail on how enterprise digital transformation can enhance manufacturing productivity from three aspects: reducing production costs, improving production efficiency, and enhancing product quality. Empirical research by Liu Hedong and Ji Ran (2023) and Liu Xinxin and Hui Ning (2021) both confirmed the significant effect of digital transformation on promoting the high-quality development of manufacturing, and also indicated that there is a positive marginal increasing effect and spatial heterogeneity. Huo Chunhui et al. (2023) explored the relationship between digital transformation and the high-quality development of manufacturing enterprises from the perspective of peer effects, and the study concluded that there are significant industry peer effects and regional peer effects in digital transformation, which promote the high-quality development of manufacturing enterprises through different paths. The above research provides important ideas for the research of this topic. Based on a scientific analysis of the development status and existing problems of Chinese manufacturing enterprises, this topic proposes corresponding countermeasures and suggestions for the existing problems.

3. CURRENT STATUS OF DIGITAL TRANSFORMATION AND MANUFACTURING DEVELOPMENT IN ANHUI PROVINCE

3.1. Current Status of Digital Transformation Development in Anhui Province

In recent years, Anhui Province has achieved certain results in the development of the digital industry and manufacturing. In 2021, the State-owned Assets Supervision and Administration Commission (SASAC) of Anhui Province issued two documents: "Notice on the Issuance of the <Action Plan for Innovative Development of Industrial Internet in Provincial Enterprises (2021-2023)>" and "<Special Action Plan for Digital Transformation of Provincial Enterprises (2021-2025)>", marking the determination of the guiding principles, development goals, and key tasks for the province's digital transformation efforts. In recent years, the Anhui Provincial Government has repeatedly emphasized that enterprises should boldly integrate and innovate, continuously improve the construction of industrial internet, promote the application of cloud technology platforms, and provide the necessary hardware requirements for digital transformation of enterprises. By the end of 2022, there were about 150 industrial internet platforms in Anhui Province, with Hefei iFLYTEK's Tulin and Wuhu's Conch Cloud Work as well as Chery Haixing Cloud being the main representatives. These enterprises focus on the iteration and upgrade of front-line control systems as well as software and chips, forming a safe and controllable independent operating system for themselves, which greatly helps reduce costs and integrate innovation for enterprises. The government-led industrial interconnection platform officially launched in 2022, focusing more on top-level design and policy orientation in its construction. It not only connects enterprise needs and government actions but also involves universities' teaching and scientific research. The most typical is the "Antelope" industrial internet platform, which carries out science-industry docking and precise services to further complete the integration of demands in various fields, effectively supporting the supplementation, consolidation, and strengthening of industrial and supply chains, thus better boosting the digital transformation of enterprises.

3.2. Current Development Status of Advanced Manufacturing in Anhui Province

The advanced manufacturing industry in Anhui Province is flourishing, with significant results achieved in the transformation and upgrading of manufacturing industries centered on digitalization and intelligence. The government has issued a series of policy documents actively supporting enterprises to accelerate digital transformation and promote the intelligent development of industries. Anhui Province continues to make progress in fields such as industrial internet, intelligent manufacturing, and big data applications, constructing a number of digital platforms to facilitate the upgrade and transformation of the manufacturing industry. In recent years, Anhui's advanced manufacturing industry has made remarkable achievements in optimizing industrial structure, enhancing technological innovation capabilities, and improving production efficiency, injecting new vitality into economic development. However, challenges still exist, such as insufficient digital infrastructure construction and weak awareness of digital transformation among enterprises. Both the government and enterprises need to further increase investment, enhance industrial innovation capabilities, and drive the advanced manufacturing industry to higher levels.

3.3. Problems in the Process of High-Quality Development of Manufacturing Industry in Anhui Province

In the process of high-quality development of the manufacturing industry in Anhui Province, there are still some problems and challenges. Firstly, there is an issue of insufficient infrastructure construction in the digital transformation process of manufacturing. Although some developed regions have established relatively complete digital infrastructure, many areas still lag behind in digital infrastructure construction. In remote rural areas or some small and medium-sized cities, there

are problems such as insufficient broadband network coverage, imperfect data center construction, and even a lack of digital technology talents, all of which restrict the speed and quality of digital transformation in manufacturing. Secondly, enterprises generally face challenges such as insufficient technical level and talent reserves in digital transformation. Especially in small, micro, and traditional manufacturing enterprises, due to insufficient investment in digital technology over the long term, employees lack digital skills and knowledge, making it difficult to adapt to the rapidly developing needs of digital transformation. In addition, the high-quality development of the manufacturing industry also faces problems such as less optimized industrial structure and insufficient innovation capabilities. The industrial structure is not optimized enough, manifested in the excessive dependence on traditional low value-added manufacturing industries, while the proportion of high-tech industries and strategic emerging industries is insufficient, limiting the pace of industrial upgrading and economic transformation. The deficiency in innovation capabilities is reflected in the large gap in R&D investment intensity compared to developed regions, the lack of leading entities and platforms for industry development, resulting in weak independent innovation capabilities in manufacturing and low efficiency in the transformation of scientific and technological achievements.

4. CONCLUSION AND SUGGESTIONS

The government should increase investment in network infrastructure construction in remote rural areas and small and medium-sized cities, ensuring full coverage of broadband networks to provide basic support for digital transformation of enterprises. It should promote cooperation between local governments and enterprises to build and optimize data centers, enhancing data processing and storage capabilities, especially in regions with great economic development potential.

Enterprises are encouraged and supported to adopt advanced digital technologies such as cloud computing, big data, artificial intelligence, etc., to improve production efficiency and product quality. A special fund should be established to support enterprises and educational institutions in carrying out digital skills training projects, improving the digital skills of workers, especially employees of small and medium-sized enterprises and traditional manufacturing workers.

Financial incentives and subsidies should be used to encourage enterprises to transition from traditional manufacturing to high-tech industries while developing strategic emerging industries to optimize the industrial structure. Establishing and improving manufacturing innovation centers and platforms will promote the transformation of scientific research achievements and enhance the independent innovation capability of the manufacturing industry.

Simplify the administrative approval processes related to enterprise digital transformation, reduce operating costs for enterprises, and create a favorable policy environment. Financial support should be provided to small and medium-sized enterprises and high-tech enterprises, including tax relief and loan discounts, to lighten the burden on enterprises and stimulate digital investment.

Strengthen cooperation with internationally advanced manufacturing industries and leading companies in digital technology to introduce high-end technology and management experience. Enterprises are encouraged to participate in the formulation of international standards to improve competitiveness in the international market.

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