

# Research on the path of digital economy leading the manufacturing industry upgrading in Zibo city

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**Abstract:** The digital upgrading of traditional manufacturing industry is an important embodiment of the rapid development of digital economy. This paper is based on Zibo city, the reality of manufacturing development, deeply grasp the significance of Zibo city using digital economy to promote the transformation and upgrading of traditional manufacturing, on this basis, the digital transformation of Zibo city manufacturing current situation is elaborated, further clarify the problems and difficulties in the process of digital transformation, finally, explore the digital economy specific path to promote manufacturing transformation and upgrading of Zibo city.

**Keywords:** Digital Transformation; Manufacturing; Dilemma; Zibo; Path

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## 1. Introduction

At present, with the digital revolution and the progress of digital technology, the value of data becomes more and more prominent, becoming the fifth largest factor of production in parallel with land, labor force, capital and technology. Digital technology, with its penetration and enabling effect, derived two industrial forms of digital industrialization and industrial digitalization. In the narrow sense, the digital economy specifically refers to the new generation of information and communication technology cluster, namely "digital industrialization". In a broad sense, the digital economy is an economic activity carried out by digital technology, digital platform and digitalization, and infrastructure, namely "industrial digitization". Digital economy has emerged a large number of new business forms and new business models, and changed the traditional economic model from all levels: from the macro perspective, digital economy through big data application is expanding the boundary of planned allocation of resources, promote the integration of government and market; from the middle perspective, digital economy changes the market structure, make buyers and sellers in a completely competitive market; from the micro perspective, digital economy integrates "economy of scale" and "economy of scope", subverting the traditional enterprise profit model.

In the context of a new round of technological revolution, the global value chain is gradually transformed to data factor driven and data technology driven. Xi Jinping, general secretary based on the global strategic development of our country, put forward the "deepen the reform of supply side structural, promote the development of high quality" and "build data as the key elements of the economic system, promote the industry towards the global value chain" and other important discourse, to promote the development of digital economy provides a major strategic guidance.

Zibo city, Shandong Province has fully implemented the deployment requirements of the CPC Central Committee and the provincial Party Committee and the provincial government, and taken "digital strong city" as an important development goal. In 2022, Zibo Municipal People's Government issued the 14th Five-Year Plan Digital Strong City Construction Plan, which planned and deployed many fields such as digital economy and digital governance, emphasizing that Zibo city should be built into a digital benchmark city integrating digital technology innovation, industrial innovation and reform and innovation.

## **2. Analysis of the current situation of digital transformation of manufacturing industry in Zibo city**

### **2.1 Digital development status of manufacturing industry in Zibo City**

In the case of digital technology in full swing, Zibo city by popularizing digital technology support system, integration of infrastructure construction, in the city's digital economy enterprises give rent, plant and equipment and related incentives, make Zibo digital economy business environment to be fully optimized, digital economy to steadily promote the construction.

According to the data on the official website of the Zibo Municipal People's Government, as of March 28, 2022, a total of 41 digital economy industrial parks have been set up in Shandong province, two of which are located in Zibo, namely, Fonda E-commerce Park and Shandong Aite Yunxiang Digital Economy Park. Among them, Aite Yunxiang Big Data Industrial Park is actively building the "Zibo brand" of digital economy, building China's industrial computing power center, and fully promoting the expansion of the manufacturing industry from the direction of traditional industrial economy growth to the direction of intelligent, high-end, cluster, service, high-quality and green.

### **2.2 Typical practice of digital transformation of manufacturing enterprises in Zibo city**

Under the overall trend of the pillar industries in Zibo city gradually moving forward to digitalization, this paper selects the two leading listed companies of Jincheng Pharmaceutical and Bohui Paper Industry as examples to illustrate the current situation of the digital transformation of the manufacturing industry in Zibo city.

Jincheng medicine (300233.SZ): Jincheng pharmaceutical main business for biological pharmaceutical, cephalosporin medicine intermediates and high-end medical equipment, etc., over the years, the company with "industrial + capital" two-way drive mode, build a unique pharmaceutical industry chain, has been innovation as the source of enterprise development, with "chemical industry, biological, preparation cross-border fusion innovation" as the fundamental technology kernel constantly consolidate, and effectively with the help of the Internet platform, optimize drug sales channels and mode, enhance the company's core competitiveness. In response to the national development strategy of "Belt and Road" and "Healthy China", Jincheng Pharmaceutical has actively carried out a new green channel for sustainable development with synthetic biology, and deeply implemented the "great transformation of old and new growth drivers". Thanks to this, operating revenue increased 56.5% in the first quarter of 2022 year earlier. Through the measures of "aggregating high-quality resources and integrating resources with innovation", the group has provided a strong development power for itself, and realized the high added value of technology and the continuous improvement of the industrial service level.

Bohui Paper (600966.SH): Bohui Paper is an enterprise integrating paper research and development, production and sales. In the process of engaging in traditional manufacturing production and operation activities, Bohui Paper industry takes the development of emerging technologies as an opportunity, relying on digital and other emerging technologies to actively adjust and optimize the product structure, realize the integrated development of "forest, pulp and paper", promote the realization of industry connectivity, integration, and improve its own business efficiency. Thanks to the company's focus on industrial chain innovation and optimization, the operating revenue in 2021 reached 16.276 billion yuan, up 16.41% year on year, while the operating profit increased by 105.37% year on year. Company relying on the digital lean management project, fully through end-to-end business process, promote "intelligent production" and "digital transformation" of transformation and upgrading, and build "digital logistics", "wisdom logistics", implements the resource integration, authors increase efficiency, digital transformation and high quality development has made a great breakthrough.

## **3. Zibo city manufacturing industry digital transformation is facing the difficulties**

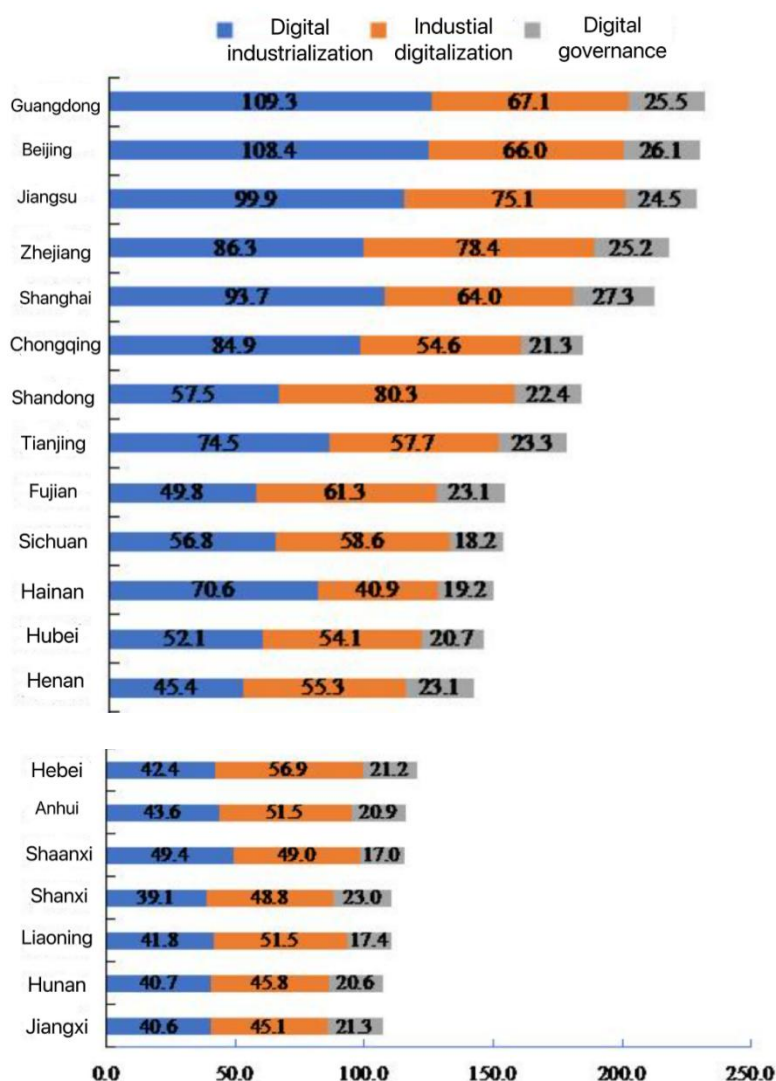
At present, the digital economy boosts the transformation and upgrading of the manufacturing industry and can achieve high-quality development. However, at the same time, there are still some difficulties in the macro digital environment, the data

security of the medium view industry, and the development of micro enterprises themselves.

### 3.1 The development of —— area is not balanced

A good digital economy development environment is a powerful catalyst for the digital transformation of the manufacturing industry, and the quality of the digital economy development in a region can be deeply discussed from three perspectives: digital industrialization, industrial digitalization and digital governance. The following figure is the ranking of the digital economy development index of TOP20 provinces and cities in China, calculated by step by step weighting method, based on the authoritative data platform of the Ministry of Industry and Information Technology of China.

The top five provinces and cities are Guangdong, Beijing, Jiangsu, Zhejiang, and Shanghai. Chongqing and Sichuan, as the central regions in the top 10, play a leading role in the digital economy in the central and western regions. In general, 75% of the TOP20 enterprises with the strong development of digital economy are provinces and cities in the eastern region, and the development of digital economy in the western region and northeast China is relatively weak. It is urgent to find some power points and need to achieve breakthroughs in the fierce competition. The unbalanced development of digital economy still exists.



Graph1: Top 20 regions in digital economy development

Resources: The National Research Center for Industrial Information Security Development

### 3.2 The Chinese view industry dimension —— data "prism door" panic

In 2013, the Prism incident in the United States directly triggered global turmoil, and the United States cooperated with the Five

For global politicians, people's information theft, let everyone chilling, sounded the wake-up call to the world, and China unswervingly go global cooperation iterative upgrade route, is bound to make local high-tech manufacturing to the United States-led developed countries to provide data theft loopholes, safeguard information security the great task requires every generation of scientific and technological talents, to firmly stick to our data abroad.

### **3.3 Micro-enterprise dimension —— capital and technology is not excellent**

The manufacturing industry of Zibo city is mostly small, medium and micro enterprises, and the family management mode leads to the solidification of enterprise leaders and the lack of digital transformation thinking, which leads to the lack of attention and enthusiasm for digital transformation. In addition, the digital transformation itself requires a high capital cost, and some enterprises are too worried that the investment in the early transformation and upgrading will not be proportional to the expected income in the later stage, resulting in doubts about digital technology.

On the other hand, Zibo city small and medium-sized enterprises digital transformation technology is missing. Mainly due to the current operating cost limit, reform the traditional production process and process itself requires a certain cost, and from the actual situation, local enterprise digital transformation effect differentiation, listed enterprise capital flow is sufficient, can boost their transformation and upgrading, but other small and medium-sized enterprises in the reform of digital technology application level faces many difficulties, especially in the background of outbreaks, small and medium-sized enterprises face greater impact and challenges.

## **4. Analysis of the digital transformation path of the manufacturing industry in Zibo city**

### **4.1 Optimize resource allocation and improve intelligent manufacturing**

The management mode and efficiency are generally backward in the manufacturing industry of Zibo city. On the one hand, enterprises should make full use of intelligent production, big data precision marketing, Internet of Things, industrial chain coordination and so on, to optimize resource allocation and expand the boundary from production process, circulation process and marketing process; on the other hand, enterprises should further promote the use of Internet and digital technology by reducing time and space barriers and job choice. Micro, medium and small enterprises should strive to improve the traditional industrial production chain, improve the conversion efficiency between various links and reduce the operating costs in all links of industrial production, such as innovative design, process improvement, strengthening quality, extended service and market expansion.

### **4.2 Construct a supply chain ecosystem and promote digital technology sharing**

Since 2019, novel coronavirus has swept the economic growth of all countries around the world. All the small and medium-sized enterprises in Zibo city need to build a digital information platform and accelerate the creation and participation in the supply chain ecosystem. The so-called supply chain ecosystem is to build an end-to-end data platform that can more effectively integrate the industrial chain (such as product development, procurement, manufacturing, logistics, marketing, sales) and all trading partners (such as multi-level suppliers, third-party logistics, and customers). Accordingly, the entire data chain ecosystem provides real-time access to key data and corresponding information for all trade participants on the Internet, and the system as a whole has intelligent information decision-making and process execution.

### **4.3 Deep integration of technology enterprises, to realize the transformation from "0" to "1"**

Traditional industry in the process of digital transformation need third party technology enterprises, can smoothly implement "winning" cloud, namely in the cloud strategy, cloud migration, cloud development, cloud management and other four fields to provide the whole life cycle management services, AI and automation technology into the workshop production line and daily business office. Such efficient cooperation and mutual assistance can bring real independent innovation and development to the manufacturing industry.

Specifically, the use of innovation of technology enterprises is mainly reflected in the following aspects: First, business model innovation, create a new production and division of labor and cooperation mode marked by digital production platform, increase the flexibility of division of labor, so that intelligent manufacturing machinery and equipment to participate in the production and operation activities of enterprises. Second, product intelligence. With the development of 5G and AI technology, relying on the Internet, the product can be transformed from a simple knowledge and simple tool in the past to an intelligent product that can realize front-end demand and background management through information technology. Three is the digitalization of customer service, the traditional industrial enterprise marketing customer product experience is static closed, the customer is difficult to have empathy ability, and with the depth of science and technology enterprises, using new digital technology can assign, through data to show the scene of the production workshop, to provide customers with the wisdom of the advance prediction service, improve customer experience. Fourth, the transparency of enterprise operation, through the information technology provided by technology enterprises to achieve the front-end demand and background management related, and at the same time to establish a more efficient connection with customers, to create intelligent workflow, improve operational efficiency.

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