

# Digital economy empowers high-quality development of manufacturing industry in Pearl River Delta

Jieying Luo, Yun Liu\*, Lingbi Guo

Foshan University, Foshan, Guangdong, 528000, China

---

**Abstract:** After years of industrial economic development, the digital economy has gradually become one of the boosters of the economy of Guangdong Province, the digital development of the manufacturing industry in the Pearl River Delta under the background of digital economy has certain advantages, through policy, technology, location, enterprises and infrastructure embodiment, in the process of integration with the digital economy, there are also new characteristics of complexity, integration and risk. According to the new characteristics brought by the digital economy to the manufacturing industry in the Pearl River Delta, suggestions on institutional top-level design, total factor productivity and digital layout are put forward, and the high-quality development of the manufacturing industry in the Pearl River Delta is realized through policy systematic reform, innovative factor allocation, and a coordinated layout for the development of the digital economy, so as to deepen the deep integration with the data economy.

**Keywords:** Digital Economy, Manufacturing, High-Quality Development

---

## 1. Introduction

According to the latest “China Digital Economy Development Report (2022)” released by the China Academy of Information and Communications Technology, my country’s digital economy will achieve new breakthroughs in 2021. The scale of the digital economy will reach 45.5 trillion yuan, a year-on-year nominal growth of 16.2%, which is higher than the nominal GDP growth in the same period. With a growth rate of 3.4 percentage points and accounting for 39.8% of GDP, the digital economy has become the new driving force, new engine and main frontier leading the high-quality development of Guangdong’s economy. In the era of data economy development, the traditional manufacturing industry in the Pearl River Delta is no longer suitable for the current digital development and is facing the problem of industrial digital transformation. Under the policy background of deeply integrating the development of the data economy and the real economy proposed in the report of the 20th National Congress of the Communist Party of China, The manufacturing industry occupies a very important position in the Pearl River Delta economy. The Pearl River Delta manufacturing industry must seize the opportunity of the data trend. It has certain practical significance to study how the data economy can empower the high-quality development of the Pearl River Delta manufacturing industry.

## 2. Current status of digital development of manufacturing enterprises in the Pearl River Delta

### 2.1. The digital development of manufacturing industry in the Pearl River Delta region has policy, technology and location advantages

First of all, the Pearl River Delta region has a profound industrial foundation. It has a manufacturing industry pattern with a solid foundation, industry clusters, complete categories, and a complete industrial chain structure. The multiple industrial clusters formed can use the industrial Internet to carry out the entire industry chain and the entire value chain. Connection has created huge market momentum for the advancement of digital technology; at the same time, Guangdong Province proposed the concept of data brokers for the first time. Data brokers can exert their capabilities and advantages in ecological collaboration, data operations, technological innovation, data security, etc., and in Guangzhou and Shenzhen has established a data exchange to provide services for data transactions of manufacturing enterprises in the Pearl River Delta. Finally, the Pearl River Delta region is close to Hong Kong and Macao, gathering a large number of data flows and information flows. Currently, the International Quantum Research Institute in the Shenzhen-Hong Kong Science and Technology Innovation Cooperation Zone The Chinese branch of the BRICS Future Network Research Institute has promoted and implemented multiple projects.

## **2.2.The Pearl River Delta has many leading companies promoting the digital economy**

According to the “Guangdong Digital Economy Innovation and Development Report” (2022), the top three cities with the highest comprehensive innovation level in the digital economy are Shenzhen, Guangzhou and Dongguan, and there are 279 top 500 companies in the comprehensive innovation level of the data economy. Located in Shenzhen, 111 are located in Guangzhou, and 37 companies are located in Zhuhai. The top three companies are Huawei, Tencent and Vivo. These key companies play a leading role in the digital economy industry chain and have become the driving force for the economy of the Pearl River Delta region. A powerful engine of growth;

## **2.3.Digital infrastructure in the Pearl River Delta continues to improve**

The overall level of information infrastructure in the Pearl River Delta region continues to improve. In 2021, the number of data center cabinets in operation in Guangdong Province will be 294,000. Shenzhen and Guangzhou are the main sources of data center demand, and the availability rate in Pearl River Delta cities exceeds 60%. , Shenzhen has reached 83%, higher than the national average of 50.69%; the Pearl River Delta data center industry has been centered on Guangzhou, Hong Kong and Shenzhen, and the Internet layout has been continuously expanded and upgraded, based on the Guangdong-Hong Kong-Macao Greater Bay Area, radiating throughout the province and even the country. As two national-level supercomputing centers, Guangzhou and Shenzhen are at the forefront of the country in terms of computing speed and digital technology. Together with the leadership of leading Internet companies, they have cultivated and built a number of intelligent and green cloud data centers.

## **3. New characteristics of the Pearl River Delta manufacturing industry under the digital economy**

### **3.1.Under the digital economy, the Pearl River Delta manufacturing system becomes more complex**

The upgrading of the manufacturing system in the context of the digital economy will be more complicated. First of all, from the factor structure point of view, the digitization of the manufacturing industry reconstructs the traditional factor structure and changes the previous factor configuration of labor, technology and capital, deepening the The scope of use of factors has also reformed the circulation methods and combination forms of traditional factors. Labor was an important industrial base in Guangdong Province in the past. The reallocation of factors will lead to systematic reforms in the mode of production; from the perspective of technological upgrading, digital The economy has spawned new technologies, new products, new business formats, and new models, expanded the scale of production and the extension of the value chain, and promoted the integration of manufacturing and the digital economy through the transmission effect, the integration of traditional industries, and the forcing effect of the demand structure, further promoting the integration of the manufacturing industry and the digital economy. Make adjustments and upgrades;

### **3.2.The Pearl River Delta manufacturing industry and the digital economy need to be highly integrated and progressive**

In the field of production, traditional production technology and digital technology are integrated and developed. The data economy has given birth to information industry technology, which has certain reforms on the existing industrial production system, eliminated and dis-integrated backward production technology, and reconstructed an era based on digital technology. based industrial production model. In the industrial field, the Industrial Internet has realized the networked, digital, intelligent and collaborative development of the industry through comprehensive connections of all factors, the entire industry chain and the entire value chain. It is the cornerstone of future industrial development and is based on the Industrial Internet. The boundaries of the manufacturing industry are gradually blurring, the internal elements of the industry are reconfigured and combined, and the manufacturing industry and other industrial chains are integrated and expanded to form new advantages of economic agglomeration; in corporate organizations, new models, new business formats, and new technologies formed by the digital economy can change The organizational structure of traditional enterprises has low data search, copy, and tracking costs, which can effectively reduce internal management and control costs of the enterprise.

### **3.3.The integration of manufacturing and digital economy in the Pearl River Delta carries certain risks**

On the one hand, the digital economy has a significant agglomeration effect, which is conducive to the aggregation of production factors in developed cities such as Shenzhen and Guangzhou. Due to the integration of data technology and manufacturing production, it is easier to form innovative advantages under the knowledge spillover effect. However, this has a negative impact on traditional manufacturing industries. has a limited role. The traditional manufacturing industry has formed high “sunk costs” due to years of fixed asset investment. The cost of optimizing and upgrading technology and digital training of the labor force is high. Therefore, the digital transformation of the traditional manufacturing industry is likely to fail; on the other hand, data The economy attracts a large amount of capital and talent to cities such as Shenzhen and Guangzhou in the Pearl River Delta, and it is easier to attract high-level universities and scientific research centers to open there. The imbalance of infrastructure construction and talent space can easily cause the development of other cities to lag behind, resulting in “development space” “Digital Divide” is not conducive to the integrated development of the digital economy and manufacturing in other cities in the Pearl River Delta.

## **4.Summary and suggestions**

### **4.1.Strengthen the top-level design of policies and adjust the development direction of the digital economy in the Pearl River Delta**

First of all, the government should strengthen the top-level design of the Pearl River Delta manufacturing policy, set different goals, directions, and plans based on the characteristics of different cities and the layout of different industries, and develop an overall layout for the entire Pearl River Delta manufacturing industry. Secondly, the government must deepen digital reform, reduce discomfort in the adjustment process, strengthen the construction of “digital government”, improve the digital management capabilities of digital government, increase infrastructure construction, make full use of the value of data information, and further enhance The government’s service capabilities, management capabilities and operational capabilities; finally, actively build digital economy pilot demonstration areas, utilize the “aggregation effect” of the digital economy, create a leading digital economy industry cluster, and form a benchmark for digital development.

### **4.2.Improve total factor productivity in the manufacturing industry and optimize the factor allocation system**

Data has become a factor of production in the manufacturing industry and is a need for the digital development of the manufacturing industry. The coordinated development of the industrial chain, innovation chain, capital chain and talent chain can promote the integrated development of the digital economy and manufacturing. It is necessary to improve the efficiency of the use of production factors in the manufacturing industry. , on the one hand, we must focus on cultivating various innovation elements and increase investment in the training of innovative data science talents and data resource libraries; on the other hand, we must optimize the construction of data resource systems, improve the allocation efficiency of innovation elements, and use data flows to , reduce the cost of information asymmetry, strengthen the connection and interoperability between enterprises and the market, enterprises and the government, optimize the allocation of data elements in the Pearl River Delta manufacturing industry, and improve the element allocation system.

### **4.3.Make overall plans and take into account the digital layout of industries in the Pearl River Delta and promote the coordinated development of digital industries**

Based on the phenomenon of “digital divide” between the Pearl River Delta regions, first of all, we innovatively explored and proposed the “one core, three poles and multiple points” model to build a data cloud platform with Shenzhen as the main center and Guangzhou, Hong Kong, and Macau as sub-centers. Integrate the construction of data collection, aggregation, and management to achieve a controllable and shareable mechanism. At the same time, we will build sub-nodes in Foshan, Dongguan, Zhaoqing, Zhuhai and other regions to build a data circulation environment that adapts to the characteristics of the Pearl River Delta region; secondly, infrastructure The level of construction will affect the height and speed of industrial manufacturing. Data-based infrastructure construction and traditional infrastructure construction have higher technological content. Increase research and development investment in new infrastructure construction, coordinate the layout of the new infrastructure construction space in the Pearl River Delta, and give full play to its Diffusion and radiation in the economy and socie-

ty; finally, identify the breakthrough point in the development of digital industrialization, provide artificial intelligence, 5G technology, cloud computing and other advanced data technology support for industrial digitalization, form a good pattern of complementary advantages, and gradually accumulate digital development experience and provide development advice, technology and elements to regional cities outside the region.

## References

[1] BAI Xuejie, Song Pei, Li Lin. The development of digital economy promotes the transformation of industrial structure [J]. Shanghai Economic Research,2022,404(05):79-80.

[2] Fu Wenyu, Li Yan, Zhao Jingfeng. How does the digital economy enable China's manufacturing industry to optimize and upgrade? [J]. Exploration of Economic Problems,2022,No.484(11):128-142.

[3] Liu Wenyong. The window of opportunity for advanced manufacturing in the era of digital economy [J]. Shanghai Economic Research,2023,414(03):58-70.

[4] Wang Wei. Transformation of Chinese Industrial Modernization under the background of Digital economy [J]. Journal of Xi 'an University of Finance and Economics,2023,36(2):21-29.

## Author Biography:

Luo Jieying (1999-), female, Han ethnicity, from Foshan, Guangdong. She is currently a graduate student at Foshan University of Science and Technology, pursuing her studies in International Business.

Liu Yun (1966-), female, Han ethnicity, from Yongxing, Hunan. She is a master's supervisor and a professor at the School of Economics and Management, Foshan University of Science and Technology. Her research interests include the operation of multinational companies and fiscal and tax policies.

Guo Lingbi (1999-), female, Han ethnicity, from Loudi, Hunan. She is a graduate student at Foshan University of Science and Technology, majoring in International Business.