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Research on Typical Cases of Integration of Jiangsu Logistics Industry and Manufacturing Industry

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Abstract: This project aims to comprehensively investigate the current status of the modern logistics industry and advanced manufacturing development in Jiangsu, China. Its primary goal is to gain a precise understanding of the challenges and shortcomings in the integration of the logistics and manufacturing sectors in Jiangsu, as well as to delve deeply into the factors constraining this integration. Additionally, through empirical research on representative cases and study areas, it intends to propose policy recommendations for the development of the integration between the logistics and manufacturing industries. These recommendations aim to promote high-quality development of manufacturing in the context of the new development pattern, strengthen the foundational capabilities for logistics-manufacturing integration, and foster innovative models and formats for the integration of logistics and manufacturing.

Keywords: Logistics Manufacturing, Case, Advanced Manufacturing.

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1. The Current Status of Integration between Logistics and Manufacturing in Jiangsu

Jiangsu is currently in a critical period of transitioning from old to new economic drivers. The widespread integration of new-generation information technology into manufacturing is accelerating the industry's upgrade towards intelligence, sustainability, and digitalization. Promoting deep integration between modern logistics and advanced manufacturing is not only an essential requirement to adapt to the new round of technological revolution and industrial transformation but also a key initiative in building a modern industrial system. It serves as an effective approach to lead the way in reform, innovation, and driving high-quality development.

In recent years, Jiangsu has witnessed a continuous deepening of integration between these two industries. It has explored and developed distinctive models of integration that bear the characteristics of Jiangsu. However, there are still practical issues such as the limited scope of integration, insufficient depth of integration, and a need for enhanced integration capabilities. In the context of the new development pattern, it is crucial to align with industrial development trends, with a focus on increasing the depth of integration and nurturing new formats and models of integration. This approach serves as a breakthrough point for the integration of these two industries and will pave the way for achieving high-quality industrial development.

2. Jiangsu Logistics and Manufacturing Industry Case Study

2.1 Path Innovation + Digitalization + Industrial Interconnected Platform

As a leading enterprise in the traditional steel industry, Nangang Steel has made significant advancements in smart interconnectivity in recent years. Leveraging its digital capabilities, Nangang Steel has established industry-interconnected platforms like GMS (Global Manufacturing System). They have fostered close cooperative partnerships with raw material suppliers, maritime and machinery manufacturing users, logistics providers, and banks. Additionally, they have incubated Xinzhilian Technology and Xinyang Supply Chain, which are digital service platforms for supply chain management, expanding into regional logistics services. This approach emphasizes the innovation and development of service formats, intensifies the integration between manufacturing and logistics industries, and constructs an efficient and convenient industrial ecosystem.

2.2 Industrial Interconnected Platform + Blockchain

Yangli Group Co., Ltd., located in the Hanjiang District, is a metal forming manufacturing company. Using advanced cryptography and blockchain-based big data

analytics, they have implemented an equipment manufacturing supply chain management system on an industrial internet platform. This system enables the tracking and traceability of internal operations such as raw material management, production logistics, and warehouse management, creating a new type of supply chain management system. It addresses issues related to inadequate enterprise collaboration and the lack of a fundamental trust mechanism.

2.3 Smart Manufacturing + Value-Added Services

Zhitoon Sanqian has been successfully selected as a pilot unit for the deep integration of advanced manufacturing and modern service industries in Jiangsu Province, thanks to its comprehensive capabilities. They have nurtured and established an advantageous industrial chain, new industrial clusters, integration demonstration platforms, and an industrial ecosystem that combines "smart manufacturing" with "value-added services." Zhitoon Sanqian actively explores new formats of integration between the two industries, with the goal of empowering physical industries, reducing costs, and increasing efficiency. They have made continuous efforts in the field of industrial internet, creating an integrated logistics supply chain ecosystem that encompasses taxation, digital scheduling, digital finance, insurance, and digital upgrades, thereby promoting high-quality development in the Chinese logistics supply chain.

2.4 5G + Digital Factory + Intelligent Logistics

The headquarters of Zhongtian Iron & Steel Group Co., Ltd. is located in Changzhou City, Jiangsu Province. They are committed to creating the "Zhongtian Intelligent Manufacturing Dream Factory." To accelerate the integration of the "two industries," they have launched projects such as one-click automatic steelmaking, leadership cockpit, and "5G + digital factory." Leveraging 5G and industrial internet technologies, Zhongtian Iron & Steel has achieved real-time monitoring and management of core elements such as personnel, production, equipment, logistics, environmental sustainability, and safety. The first-phase digital factory of Zhongtian Iron & Steel Group adopts flexible design and combines individual intelligence with global intelligence. Various intelligent systems, including one-click steelmaking, unmanned driving for material feeding, fully automated rapid batching system in front of the furnace, and a 5G steelmaking logistics tracking system, shine throughout the "5G + digital factory" of Zhongtian Iron & Steel.

2.5 Internet Freight + Integrated Supply

XCMG Intelligent Link takes full advantage of the resource characteristics of Xuzhou's "public transportation and waterways." They leverage specialized resource allocation advantages and construct intermodal transportation channels using railway, road, and waterway transport resources. This forms a logistics network service system that combines channels and hubs, exploring a multimodal intermodal logistics integration model that suits the equipment manufacturing industry's characteristics. By integrating and connecting the information systems of upstream and downstream companies in the supply chain, they continuously enhance the collaborative operation of various business segments. Gradually, they have built a full-chain logistics service system that serves equipment manufacturing enterprises. Internally, they leverage logistics integration advantages to optimize the overall operating costs of the supply chain. With an efficient logistics distribution model, they empower XCMG's intelligent manufacturing. Externally, they actively explore new industrial ecosystems, accelerate the construction of an industry ecosystem supported by logistics services, and drive sales of XCMG's main products.

2.6 Efficient Flexible Production + Zero-Distance Visibility

FeiLiDa Intelligent Manufacturing has introduced a supply chain collaborative platform for in-factory logistics. They are committed to creating an ecosystem that benefits all parties and seamlessly integrates in-factory logistics with factory systems. Real-time data transmission supports highly flexible production. For brand owners, it achieves real-time visibility of inventory data throughout the supply chain, enhancing supply chain data accuracy and controllability. This leads to improved sales strategy and product competitiveness. For manufacturing factories, it enables Kanban pull, end-to-end visibility of demand, JIT operations, and zero in-factory inventory, enhancing supplier inventory turnover and significantly reducing overall operating capital costs. Simultaneously, it optimizes in-factory space, freeing up more production capacity. Various component suppliers can use real-time inventory alerts to dynamically replenish inventory, ensuring controllable orders and production plans. It can even enable green and sustainable circular packaging based on clearer data.

2.7 Shared Production Platform + Digitalization + Upstream-Downstream Collaboration + Integrated Service Platform

Wanbang Digital Energy Co., Ltd. has established an integrated business platform that promotes upstream-downstream collaboration, in line with the idea of "innovation-driven, intelligent transformation." This platform is designed to develop collaborative production and operational capabilities for new energy vehicle charging equipment. Wanbang Digital Energy conducts in-depth project-based personalized product design, manufacturing, and digital system integration. They integrate data resources

from energy production, transmission, and consumption, creating an internally interconnected integrated manufacturing control platform and a collaborative resource-sharing service chain. This initiative advances the integration of new energy production, usage, and green manufacturing.

2.8 Smart Manufacturing + Smart Factory

Suzhou Bozhong Precision Manufacturing has been focusing on smart manufacturing for 15 years and achieved over 3 billion yuan in revenue in 2021. The company has established an integrated smart factory service platform in three major areas: new energy vehicle charging and swapping, consumer electronics, and semiconductor packaging and testing. The company's charging and swapping stations, developed in cooperation with Hanchuan, complete the entire swapping process in just 90 seconds, faster than conventional refueling. Their new energy vehicle charging and swapping station products have been recognized as "Jiangsu Premium."

2.9 Industrial Internet + Platform Empowerment

Xugong Hanyun is a specialized industrial internet company incubated by Xugong. In recent years, it has driven the development of its e-commerce platform by creating the Hanyun Industrial Internet platform. Leveraging "5G + Industrial Internet" technology, the Hanyun platform has built upon supply chain informatization and industry e-commerce platforms, achieving fundamental data collection, diversified product layout, and multi-scenario intelligent applications. Empowered by this platform, Xugong Group's construction and engineering company provides services to global customers through models like "panoramic car viewing," "gold-mining store," and "live streaming building." This approach facilitates precise online matching between equipment and buyers, thereby promoting the development of new business models.

2.10 Digitization + Intelligent Services

Suzhou Hanchuan Intelligent Company, located in the high-end manufacturing and international trade zone of Suzhou Industrial Park, is recognized as a national high-tech enterprise. The company specializes in core digital technology and operates in the fields of automation equipment and industrial software. They provide intelligent digital products and comprehensive smart manufacturing solutions to clients in industries such as automotive electronics, new energy, and healthcare.

In the realm of logistics, the company has deployed the SCM (Supply Chain Management) system for supply chain relationship management. Through integrated system connectivity, they have established the PASSPORT unified operational management platform to streamline the management of various business processes, including logistics and procurement. This has effectively reduced costs across various processes and improved efficiency and core competitiveness.

3. The Problems Faced by the Integration and Development of Jiangsu's Logistics and Manufacturing Industries

At present, there are still certain issues with the integration of the two industries in Jiangsu, as follows: The depth of integration between the two industries in Jiangsu, whether at the industry or enterprise level, is relatively weak. Integration has been more successful among industry leaders and key enterprises, while smaller enterprises have lower participation rates. The integration primarily focuses on industries like equipment manufacturing and household appliances, with other sectors lagging behind. There is a noticeable lack of collaboration between enterprises and industries, and the integration of the two industries has not yet become a strong driver for energy and structural transformation. The development of the logistics industry is relatively lagging. There is a lack of influential and well-known service industry enterprises, which hampers their ability to support and lead the integration of the two industries. There are significant economic disparities between southern Jiangsu, central Jiangsu, and northern Jiangsu. This hinders deep cross-regional industrial integration.

In terms of policy support: There is a need to enhance the coordination of complementary policies. Funding primarily relies on central special funds, service industry special funds, and special financial funds for the deep integration of the two industries. Financial institutions show insufficient innovation in financial credit products and services related to the integration. A unified integration evaluation standard and indicator system have not been established yet, making it difficult to accurately assess factors like service industry input and its contribution to manufacturing. Some regions lack exploration of new land usage patterns, such as mixed-use land for new industries. There is a shortage of talent resources that understand both manufacturing and services, which are essential for the integration of these two sectors.

Lack of Leading Enterprises and Insufficient Dominance and Integration Capability in the Industrial Chain. Despite having the largest number of large-scale enterprises in the country (accounting for 10.74% of the national total), Jiangsu faces challenges in terms of the influence and control of these enterprises. There is a shortage of large companies or conglomerates with significant global industry influence and leadership. Jiangsu only has three companies listed in the Fortune Global 500, and there are only five companies with a market capitalization of over 100 billion RMB, both of which are

lower than provinces and cities like Guangdong and Shanghai. In terms of "unicorn" companies, Jiangsu lags behind Beijing, Shanghai, and other regions by both quantity and scale. In the national top 100 companies, only three enterprises from Jiangsu made the list, which is significantly lower compared to Guangdong, which has 21 companies listed. Looking at emerging industries like the internet, in 2019, only three Jiangsu-based companies made it into the top 50 of China's top 100 internet companies. This is considered a relative weakness for Jiangsu. In contrast, Zhejiang is home to Alibaba, ranking first in the country, and Ant Group, ranking fifth. Guangdong boasts several globally recognized innovation leaders like Huawei, Tencent, DJI, and BYD. It also has a multitude of "unicorn" companies, as well as numerous smaller and medium-sized innovative enterprises in various industries.

4. Solutions for the Integration of Logistics and Manufacturing in Jiangsu

Based on the research findings, the project team proposes the following recommendations:

First, the development of the integration between manufacturing and logistics should be market-oriented, with enterprises as the main actors, while adhering to the principle of "government guidance, enterprise operation, adapting to local conditions, and step-by-step implementation." This approach should encourage logistics companies to provide customized services to manufacturing enterprises, enhance their capabilities in providing fine-tuned and high-quality logistics services, and accelerate the transformation into logistics service providers and supply chain service enterprises for the manufacturing industry. It should also strengthen the flexible and agile manufacturing capabilities of manufacturing enterprises, remove bottlenecks, bridge gaps, and achieve the organic connection and innovative integration of logistics service supply and demand. This will help manufacturing enterprises extend their industrial chains, stabilize their supply chains, enhance their value chains, and build a modern industrial chain and supply chain system, thereby promoting the formation of a "dual circulation" new development pattern.

Second, government departments should provide strong guidance and play a decisive role in allocating market resources. They should fully mobilize the enthusiasm and initiative of manufacturing enterprises, support logistics companies and manufacturing enterprises in innovating supply chain collaboration models through market-oriented approaches, and establish mutually beneficial and long-term strategic partnerships. The government should improve the legal and orderly market order, creating a more favorable business environment. Meanwhile, businesses should strengthen their commitment to contracts and enhance contract management.

Third, actively promote the integration and sharing of information resources between logistics companies and manufacturing enterprises. On one hand, actively promote the application of emerging technologies such as blockchain and 5G in the construction of logistics information sharing and exchange systems to enhance the digitization level of the logistics industry. On the other hand, facilitate the integration of industrial internet in the logistics field and establish logistics industrial internet platforms. Support large industrial parks, industrial clusters, logistics hubs, and others to connect through third-party logistics information platforms, providing timely and accurate logistics information services.

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Conflict of interest

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