

A Study on Cost Reduction and Efficiency Increase Strategy of Wuxi Manufacturing Industry and Logistics Integration Under Supply-Side Reform

Zhang Rui^{1*}

Wuxi Institute of Technology, Jiangsu Wuxi 214121, China

*Corresponding author: zhangr@wxit.edu.cn

Abstract: To be exact, the Internet of the consumer side appeared at the beginning of this century. After the platform construction, the establishment and improvement of business model, the rise of e-commerce, the follow-up of distribution logistics, and the emergence of mobile Internet, it can be said that network sales have become a part of ordinary people's lives. This series of changes drives the reform of the whole circulation field. It has been more than a decade since the integration of online and offline, retail and logistics. However, in order to truly complete the comprehensive upgrade of the demand side, it is necessary to rely on the transformation and upgrade of the supply side, so as to achieve low cost and high efficiency and timely provide diversified and personalized products and services according to the quality required by users. Therefore, there is no doubt that the Internet penetration and intelligent transformation and upgrading of the supply end, especially the manufacturing end, have become an inevitable trend. Based on the background of domestic manufacturing industry transformation and upgrading, taking Wuxi manufacturing industry and logistics integration as an example, this paper attempts to explore feasible paths and relevant countermeasures, hoping to inspire relevant decision makers and industry practitioners.

Keywords: Manufacturing and Logistics, integration, Wuxi Practice

According to the theory and practice of development economics, with the vigorous development of economy, the original advantages of basic elements will gradually weaken, and the continuous development will inevitably change the strategic orientation, adjust the original economic order, and establish a new power engine. This is the story of all developed countries. Prior to that, China experienced the stage of export-oriented economy driven by factor price advantage, from light industry, to heavy industry, and then to the development of real estate finance. In the mid and late 1990s, we went through a series of strategic processes, including "reducing production capacity, reforming state-owned enterprises, and fully integrating into world trade". Today, innovation is the theme of the new era. Against this background, we advocate a positive attitude, in-depth study of the objective laws of economic development, so as to put forward scientific and sound solutions to prepare for the upcoming changes.

¹ Author: Zhang Rui(1968--), Male, Han, Wuhu, Anhui, lecturer, master of Wuxi Institute of Technology, research direction: logistics management. Address: 1600 West Gaolang Road, Wuxi City, Jiangsu Province. E-mail: zhangr@wxit.edu.cn . Tel: 15852835930

1. Economic Transition and Supply-side Reform

In today's era, China's supply-side structural reform is aimed at adjusting the mismatch between supply and demand, reducing costs and increasing efficiency, improving effective supply and promoting economic transformation under the circumstances of international and domestic economic demand slowing down, rising costs, human resources and capital, excessive capacity and disorderly competition. It is well known that China is a big manufacturing country. In terms of total volume, China has surpassed the United States several years ago to become the world's top manufacturing country, but the structure is still dominated by traditional manufacturing industry, sales rely heavily on the international market. Moreover, our technical level is low. It can be said that the products are low-end, high cost, high energy consumption, and the production capacity is serious and even unsustainable. Since manufacturing industry is the foundation of our country, the transformation and upgrading of manufacturing industry is the inevitable choice of powerful countries, so manufacturing industry is the main battlefield of supply-side reform. The main contents of the reform include: capacity reduction, de-stocking, deleveraging, cost reduction, improving underdeveloped areas. To sum up, it is necessary to improve the survival environment of micro enterprises through macro-control, so as to optimize the industrial structure, first cure symptoms; Then, we should strengthen the weak links in the operation of industrial enterprises, and promote the transformation and upgrading of the manufacturing industry through supply-side reform, so as to achieve the effect of curing the root cause. In addition to the optimization of enterprises themselves, it is necessary for enterprises to focus on the upstream and downstream of the whole industrial chain in the process of manufacturing transformation. The core is the integration of manufacturing and logistics. On this basis, the professional capacity of producer services is brought into full play, so as to comprehensively improve the ability of manufacturing enterprises in R&D, design, procurement, manufacturing, order processing, distribution and logistics, brand building and other aspects, so as to achieve the goal of China's manufacturing industry from big to strong.

2. Review of Supply-side Reform and Logistics Integration in Manufacturing Industry

Nowadays, the development of information technology is changing with each passing day. On the one hand, with the application of the Internet gradually infiltrating from the consumer side to the supply side, the concepts and practices of intelligent supply chain, intelligent manufacturing and industrial cloud are gradually familiar to us; on the other hand, the logistics and supply chain management practices of enterprises based on the "value chain" theory have accumulated valuable experience for the integration of manufacturing and logistics. In this regard, domestic experts and scholars have also carried out a variety of studies. Liu Mingda and others compared the innovative development of manufacturing industry in major economies from the perspective of supply side. Cheng Hao and others explored the mechanism of supply side reform and transformation and upgrading of manufacturing industry. Shen Kunrong and so on studied the way of supply side reform docking the "double innovation" platform and the "Internet +" platform to achieve the upgrading of manufacturing industry. Dai Jianping and Luo Wenping studied the linkage mechanism between logistics industry and manufacturing industry based on core competitiveness. It can be said that these studies are quite enlightening, but they do not discuss the specific landing measures enough.

Based on the idea that the Internet and supply chain strive to realize the integration of manufacturing and logistics to reduce costs and increase efficiency, this paper puts forward and studies the key issues and implementation strategies.

By comparing and studying the literature, and combining with the investigation and research on the transformation and upgrading of manufacturing industry in Wuxi area, this paper tries to put forward some suggestions and suggestions for reference, hoping to provide practical reference and guidance for the practice of industry enterprises.

3. Problems and Industrial Upgrading of Wuxi Manufacturing Industry

In the past few years, Wuxi has insisted on the comprehensive transformation and upgrading of the manufacturing industry, and achieved certain experience and effects. But there is no denying that it has come at a great cost. According to the data, compared with 2005, the output value of three traditional and high energy consuming industries in Wuxi's top ten manufacturing industries decreased significantly in proportion to the manufacturing industry above scale. Among them, the textile industry declined from 10.9% in 2005 to 5.9% in 2010, down 5 percentage points, leading the decline. Although the proportion of ferrous metal smelting and rolling processing industry remains the top ten industries, the proportion of the above scale manufacturing industry decreases from 19.7% in 2005 to 15.3% in 2010, with a decrease of 4.4 percentage points, ranking the second. The manufacturing of chemical raw materials and chemical products decreased from 8.7% in 2005 to 7.8% in 2010, representing a decline of 0.9 percentage points, ranking fourth. The largest increase was in the electrical machinery and equipment manufacturing industry, which increased by 6.3 percentage points from 7.7% in 2005 to 14.0% in 2010. The transportation equipment manufacturing industry increased by 3.7 percentage points from 4.7% in 2005 to 8.4% in 2010, the second largest increase. By upgrading traditional industries, developing advantageous industries and fostering emerging industries, the old and new industries have been reshuffled, and the overall structure of the manufacturing industry has been constantly optimized.

In order to further eliminate high energy consumption, high pollution and low efficiency, Wuxi closed a number of small chemical, steel, printing and dyeing, cement, electroplating and other "five small" enterprises. At the same time, related industries are also transferred to other cities and provinces. But it also brings with it the embarrassment of "the cage's gone, the bird's not here." Emerging industries have fallen short of expectations, while traditional ones have retreated.

In the current stage, the main problems are: first, the level of manufacturing products is not high. Many enterprises are in the low-end processing links, with fierce homogenization competition and poor growth. Secondly, most manufacturing enterprises are still in the low-end of the industrial chain and value chain, relying on cheap and low-end labor for a long time. Thirdly, emerging industries lack high-end talents. Their market competitiveness and anti-risk ability are weak, and it is difficult to support the rapid economic growth of the whole city. Fourthly, the independent innovation ability of enterprises is not strong and the core technology

is highly dependent on the outside world. In this case, the high-end equipment, key parts and components, and key materials needed for industrial development are mostly dependent on imports. Fifthly, the shortage of labor force is becoming more and more serious. Manufacturing enterprises are constrained by factors such as tightening credit, rising labor costs and so on. Capital pressure is generally high, and business profits are small. Sixth, the producer service industry is insufficient and low-level. Seventh, manufacturing equipment needs to be upgraded.

To this end, Wuxi has formulated a three-year plan of action for industrial upgrading, especially manufacturing upgrading (2016-2019). In addition, Wuxi complied with the trend of "Internet +" development, actively butted "made in China 2025" and Jiangsu action plan, and thoroughly implemented the decision and deployment of the municipal and municipal government's strong industry and four modernizations. It insisted on developing intelligent manufacturing with special advantages, and focused on promoting intelligent workshop (factory) construction and upgrading the level of intelligent equipment manufacturing. In accordance with market oriented, governmentled, innovation driven, demonstration driven, classified and hierarchical, and industry based, it continues to advance step by step, focusing on promoting enterprise research and development, production, management and service intellectualization, focusing on the development of intelligent equipment and intelligent products. At the same time, Wuxi accelerates the promotion of the city's overall level of intelligent manufacturing, and promotes the industry to high-end, so as to create a new high ground for the development of modern industry in Wuxi.

As a matter of fact, a series of work done by Wuxi city in recent years fully conforms to the requirements of national supply side reform policies and guidelines, and has accumulated a lot of valuable experience from top level design to grass roots practice. For example, Wuxi cooperated with jiangsu haibao software co., ltd. to set up a professional consulting service platform integrating industrialization and informatization, which can support intelligent upgrading of manufacturing enterprises. At the same time, a series of examples of demonstration manufacturing enterprises are introduced. In the aspect of producer services, there are multiple explorations and practices in finance, trade, logistics and other aspects, such as supply chain financial informatization supervision platform, e-commerce and logistics platform, O2O platform, cross-border communication platform, smart city distribution platform, intelligent warehousing and transportation. At the same time, it strengthens the planning and guidance of intelligent industry development. Despite the rapid development and progress, there are also many problems and deficiencies.

4. The Linkage Status and Deficiencies between Wuxi Logistics Industry and Manufacturing Industry

As a key manufacturing city in China, in order to maintain its industrial and economic development advantages in the new era, Wuxi must face the new demand characteristics, adapt to the changes in the industrial development environment and the domestic and overseas competition, so as to carry out the transformation and upgrading of the manufacturing industry.

Undoubtedly, to improve the competitiveness of manufacturing industry in an all-round way, it is necessary to strengthen the technological and managerial capabilities of manufacturing industry itself. It is urgent to upgrade the automation of facilities and equipment to realize intelligent manufacturing. At the same time, it is time to integrate manufacturing process and logistics process in manufacturing industry, and face upstream and downstream supply chains by means of business data, so as to improve the level of supply chain management with manufacturing as the core. Moreover, it is also a strategic choice to enhance the competitiveness of manufacturing industry in an all-round way by means of specialized productive services.

It can be said that the current relative lack of Wuxi manufacturing is intelligent facilities investment planning and adjustment, the layout of the Internet industry, modern logistics system and a high level of support of producer services, one of the most important is the "information service, logistics services, financial services, technical services and the support of all kinds of professional services. Among these elements, only logistics service is a substantial service. It solves the problems of quick response to customers and coordination and efficiency of upstream and downstream material circulation, which is conducive to the rapid development of products, rapid delivery of products and reduction of circulation costs. The most important link is logistics and supply chain. Without the link service of logistics and supply chain, it is impossible to realize the effective operation of enterprises, or expand production and complete the overall task of circulation, not to mention the optimization and promotion of industrial economy and regional development.

Based on the domestic practice, Shenzhen, where the manufacturing level is relatively high, is the most perfect and developed supply chain area in China, which concentrates more than half of the leading domestic supply chain enterprises. Abroad, the United States, Japan and Germany, which have developed high-end manufacturing industry, are all big and powerful countries in logistics and supply chain.

In order to achieve the goal of transformation and upgrading of manufacturing industry, Wuxi must play the role of logistics and supply chain in optimizing industrial chain and internal operation of manufacturing industry.

Therefore, it is of great significance to comprehensively examine the linkage between Wuxi manufacturing industry and logistics, find the deficiencies, and propose countermeasures for improvement and improvement.

As far as we are concerned, the linkage between Wuxi manufacturing and logistics has the following characteristics and deficiencies:

1. In terms of demand, some manufacturing industries are still operating in a "big and complete, small and complete" environment. Moreover, their awareness of service outsourcing is not enough.
2. On the supply side, in addition to the rapid development of e-commerce logistics, express delivery and trunk logistics in recent years, most of them are small, scattered and low concentration. The logistics industry in Wuxi lacks a complete layout of logistics industry system oriented to manufacturing industry, so it can not fully

- undertake the integration of manufacturing logistics outsourcing and supply chain.
3. The functions of existing logistics enterprises are mainly traditional warehousing, transportation and distribution, and the value-added functions are not developed enough, especially the third-party and fourth-party logistics enterprises which can integrate the supply chain.
 4. The input of enterprise informatization is uneven, and the supply chain coordination of manufacturing industry is poor. The social modern logistics information platform and intelligent facilities and equipment are deficient, and all kinds of physical logistics platforms and networks are not perfect.

Therefore, under the current situation, the linkage between Wuxi manufacturing industry and logistics cannot meet the requirements of product individuation, branding and rapid transformation. Wuxi's manufacturing industry does not play a prominent role in improving manufacturing industry efficiency and reducing costs. Its support for emerging industries such as automobile manufacturing, home industry, consumer electronics industry, intelligent home appliance industry, fashion clothing industry and other leading industries with increasingly obvious individuality has not been effective. After-sales service support for advanced equipment industry is still in its infancy, and a large number of supply end logistics in manufacturing industry still need to be integrated.

5. Overall Idea of Reducing Cost and Increasing Efficiency of Wuxi Manufacturing Industry and Logistics under Supply-side Reform

It can be said that the consumer Internet began at the beginning of this century. After the platform construction, the establishment and improvement of business model, the rise of e-commerce, the follow-up of distribution logistics, until the emergence of mobile internet, network sales become a part of ordinary people's lives. It has been more than ten years since it brought about changes in the whole circulation field, the integration of online and offline, and the integration of retail and logistics distribution. However, in order to truly complete the overall upgrading of the demand side, we must rely on the transformation and upgrading of the supply side, in order to achieve low cost and high efficiency, and to provide diversified and personalized products and services in time according to the quality required by users. Therefore, for the supply side, especially the manufacturing side of the Internet penetration and intelligent transformation and upgrading has become an inevitable trend. The transformation and upgrading of this part involves a large number of specialized technology and management processes, spanning many industries, requiring different knowledge, skills and organizational methods. In other words, it takes more time to accumulate in order to form a mature operation mode.

It is believed in this paper that based on the assumption of industrial Internet, Wuxi city can gradually build various new platforms based on informatization to gather manufacturing resources, logistics resources and distribution resources scattered at both ends of supply and demand of the manufacturing industry. It is necessary to increase the transparency of information, reduce intermediate links, and initially reduce the transaction cost of enterprises.

Through all kinds of B2B platforms, it is necessary for access enterprises to get benefits, improve efficiency, and gradually eliminate the disadvantages that cannot keep up with. Secondly, it is more important to carry out multi-mode supply chain transformation guided by the idea of "value chain" and relying on information, aiming at the uneven scale, foundation and types of enterprises in the industrial chain. This is relatively weak, and the business sector needs to make up lessons and conduct in-depth research on a large number of links. At the same time, the supply chain needs excellent operation, strain and optimization to achieve the goal of improving efficiency. Only by completing this step can we achieve integration and improve efficiency. Finally, based on the construction of an orderly and honest industrial ecological framework, on the one hand, we can exert the power of professional productive service enterprises and institutions, and on the other hand, we can improve the overall competitiveness of the manufacturing industry with the comprehensive service support of private cloud and hybrid cloud. Intelligent supply chain based on data operation is our ultimate goal. This is also the future supply side upgrade model.

6. Specific countermeasures and suggestions

As mentioned above, through the study of relevant literature, this paper theoretically sorted out the reasons why the integration of manufacturing and logistics industry promotes the transformation and upgrading of manufacturing industry, and put forward relevant ideas. In this section, we do some research on the latest practice of the integration of manufacturing and logistics in Wuxi, and understand the effective methods in the integration of manufacturing and logistics, and further deepen on this basis.

In this paper, the overall countermeasures and suggestions for the integration of manufacturing and logistics in Wuxi area are: to formulate a flexible industrial integration plan; according to the relevant situation and industrial demand at home and abroad, to implement it in stages and with emphasis. It is necessary to introduce and support leading enterprises in the integration of manufacturing and logistics, specialized companies. It is necessary to set up industry convergence fund, build industry-university-research platform, and share experience with enterprises from the level of industry associations to promote implementation. Specific recommendations are as follows:

(1) Under the consensus that the industrial Internet has become the main direction of industrial integration and manufacturing upgrading, the current and even longer period of focus is to implement segments and sub-focus.

It is urgent to establish an industrial Internet and implement connectivity between upstream and downstream industrial chains. At the same time, it is necessary to share information, coordinate operation, reduce the cost of raw materials, improve the rate of good products, and provide the speed of products from design to production and listing, so as to directly improve the competitiveness of enterprises in the industrial chain. Here are a few tasks to do well.

1. It is necessary to guide industrial funds to lay out key areas of industrial Internet and

to support and attract leading enterprises of industrial Internet to transform the manufacturing industry in Wuxi. Industrial funds and leading enterprises are the most powerful promoters. We should be able to quickly assemble and effectively combine innovative enterprises, talents and funds with a professional perspective, quickly occupy the commanding heights of the industrial Internet, open up the situation, produce benefits and give full play to demonstration effect, so as to point to point and face to face. In this regard, Alibaba, Tencent, Jinshan, UFriends and other enterprises have this layout. A large number of investment funds for industrial Internet and manufacturing upgrading are also establishing and cultivating new types of node enterprises, productive service enterprises and platforms in traditional manufacturing towns. At the same time, according to its own weak links and key areas, the region can also set up special funds to make up for the shortcomings of market operation.

2. It's time to do a good job of industrial planning in this region. On the one hand, we should encourage the establishment of various information platform companies with value-added functions in the field of circulation in order to gather trunk transport companies, small express transport companies, express delivery companies and urban distribution companies, and make full use of social transport vehicles and various warehouses, so as to establish an entity supply network and distribution network serving the manufacturing industry in different sectors. It is necessary to reduce procurement cost and logistics cost and improve operation efficiency. We should invest in building intelligent warehouses, transportation and distribution facilities and equipment adapted to the modern supply chain, so as to play a key role in the circulation of urban commodities.
3. Based on the original advantageous industries such as Internet of things, big data and cloud computing in Wuxi, the intelligent manufacturing and intelligent logistics equipment industries, which are closely related to industrial transformation, are further developed, and the applications related to the upgrading of manufacturing industry are strengthened to gradually form a mature operation mode.

In this way, in the construction of industrial Internet, a complete ecosystem will be formed from the demand end to the supply end, from the planning end to the application and practice end. In the future, the development of industrial Internet will gain continuous impetus.

(2) In the long term, supply chain should be integrated with data to realize the integration of intelligent manufacturing and intelligent logistics, so as to realize lean and flexible operation from production to demand. Popularly speaking, upgrading of manufacturing industry is a model of "Internet + supply chain integration + industry application". Industry application is the core; Internet and supply chain integration are effective means and tools. After the implementation of industrial internet, "industry application + supply chain integration" requires a deeper industry background, such as Alibaba, Jingdong, which can quickly integrate and reshape the retail end of such a model may not be able to reproduce. In the upgrade of supply-side, manufacturing and logistics industry are an integral whole. The upgrade of manufacturing industry contains matching logistics transformation. The goal of upgrade logistics and supply chain can also effectively coordinate demand-side and supply-side. At present, in the framework of industrial

internet, we think that we need to do the following work well: to integrate manufacturing upgrading and supply chain integration in a long-term and in-depth way;

1. We will focus on factory automation and intelligent upgrading, integrate production and supply and extend to distribution. Moreover, the integration and transformation of large enterprises need the support of the industry information platform, the design and implementation of specialized intelligent manufacturing solutions and the ecosystem. The integration and transformation of small and medium-sized enterprises, due to their own technical strength and infrastructure limitations, need to rely on the connection of platform service providers and professional services, such as manufacturing service platform, logistics and supply chain platform. Finally, the goal is to monitor the normal operation of production and monitoring equipment with big data, coordinate the production within and between factories with the cloud platform, and operate the supply chain lean with the industrial Internet as the link.
2. From the demand side, we should take e-commerce system as the leading factor and personalized order combination as the driving force to integrate demand, design, production and even distribution and supply side. Based on this, large enterprises can upgrade their e-commerce platform to dock production systems. Small and medium-sized enterprises need to rely on an independent e-commerce order platform. Because of the individualization of manufacturing industry, such platforms will be subdivided according to the industry, and ultimately achieve customer-to-factory C2M customization mode. At the same time, there will also be intermediate service platforms such as collaborative design, which effectively connect customers, retailers, traditional e-commerce platforms, designers, logistics providers and manufacturers.

In view of the large amount of work involved in the above two tasks, our suggestion is that both integrators and integratees should hold the starting point of continuous improvement. According to the development of the industry and the successive emergence of integration needs, it is necessary to determine the main direction of the stage, so as to work gradually. For example, at the present stage, from suppliers to factories, there is an intermediate logistics platform for industrial products distribution, and a system combining cloud service platform and parts supply network for industrial equipment. This is because a large amount of market demand has emerged, and the entry of capital, technology and talents is natural. With the layout of industrial Internet, the demand of data service providers will appear in large numbers, because the integration of manufacturing and logistics with data will produce obvious economic benefits. The arrangement of steps in this aspect needs the help of the research and testing of specialized institutions, so as to effectively allocate resources and eliminate the rush for quick success and instant profit.

7. Summary and Prospect

It can be said that the transformation and upgrading of Wuxi's manufacturing industry is an epitome of the overall upgrading of domestic manufacturing industry. Due to the large number of small and medium-sized enterprises in Wuxi, the traditional industries are very

important. These enterprises are rooted in the local area and full of vitality. Therefore, the integration of manufacturing industry and logistics in Wuxi and the upgrading of manufacturing industry are more significant for the development of people's livelihood and regional prosperity. It can be seen that in recent years, the manufacturing industry in this region has carried out automatic and intelligent equipment upgrading, and there are a lot of cases from auto parts, electronic information industry to traditional textile and garment industry. At the same time, Wuxi has also witnessed a boom in the construction of new intelligent and automatic warehousing, emerging as an information-based leading freight platform and urban distribution platform, as well as a new type of express company and supply chain company serving the manufacturing industry, as well as examples of factory equipment networking and data-based monitoring operation. There is no doubt that these early exploration and practice have brought good economic benefits and social evaluation. Of course, there are many imperfections and unknown areas. Even so, we see the direction of manufacturing transformation and the big main direction is becoming clear.

In this paper, we advocate the integration of manufacturing and logistics. Moreover, the upgrading of manufacturing industry needs to be carried out step by step in accordance with the objective economic law on the basis of sufficient research and practice, and should exceed the policy deadline. With the help of specialized knowledge and specialized companies, we need to integrate technology, talent and resources with the help of financial forces, so as to create a mechanism, build a platform, and eventually form a good industrial ecological environment.

We believe that the future of transformation and upgrading of manufacturing industry and its related industries in Wuxi will be very bright as long as we base ourselves on improving the transformation and upgrading ability within Wuxi, with the help of external forces and resources, as well as a good industrial application environment and an inclusive atmosphere for innovation.

Reference

1. Liu Mingda, Gu Qiang. Looking at the Innovative Development of Manufacturing Industry from the Perspective of Supply-side Reform--Comparison of Major Economies in the World and Its Enlightenment to China [J]. Comparison of Economic and Social Systems 2016 (1): 19-29
2. Cheng Hao, Yang Guoliang, Ouyang Hui. Research on China's Manufacturing Industry Development under the Background of Supply-side Structural Reform [J]. Journal of Guangxi Normal University (Philosophical and Social Sciences Edition), 2017 (1): 89-92
3. Shen Kunrong, Li Xia. Research on the Transformation and Upgrading of Manufacturing Industry under the Background of Supply-side Structural Reform [J]. Chinese Higher Education Social Sciences, 2017 (1): 64-73
4. Comments and Reflections on the Linkage between Logistics and Manufacturing Industry

from the Perspective of Dai Jianping and Luo Wenping's Core Competence [J].
Modernization of Management, 2017 (2): 9-11

5. Li Peinan, Wanjinbo Industrial Internet Development and Integration [J]. Journal of Chinese Academy of Sciences, 2014 (2): 215-221