Innovation-driven Dynamic Mechanism and Strategic Analysis of Transformation and Upgrading of China's Manufacturing Industry

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Abstract: At present, with the continuous integration and development of the world economic system and the continuous improvement of national economic level, innovation driving is very important in the process of manufacturing transformation in China. The transformation and upgrading of manufacturing industry is one of the key factors of national industrial development strategy, which has its distinct characteristics. In order to rebuild the dynamic mechanism of manufacturing industry transformation and upgrading, we need to focus more on innovation and innovation of manufacturing value chain. At present, China's traditional manufacturing industry is too dependent on factor input, weak in scientific and technological innovation and competitiveness, and cannot adapt to the new trend of intelligent development of manufacturing industry. How to rely on technological innovation to promote the transformation and upgrading of China's manufacturing industry in order to enhance its position in the global value chain is the core issue facing China's manufacturing industry. In this paper, the mechanism and evolution path of innovation-driven manufacturing transformation and upgrading are deeply analyzed, and strategic suggestions are put forward.

1. Introduction

Innovation drive is to use knowledge, technology, system, business model and other innovative elements to make a new combination of existing labor, capital, material resources and other tangible elements [1]. Scientific management should be carried out with innovative knowledge and technology to transform material capital and improve the quality of workers. For the development of any economic undertaking, to reasonably follow the pace of the times and to rapidly complete effective transformation and upgrading, certain innovation drive is needed. The integration of Internet information technology and manufacturing industry is inducing a new round of transformation in China's manufacturing industry, and many new modes of production and business models have been formed [2]. China's manufacturing industry is large but not strong. The core problem is the lack of independent innovation capability. In each stage of innovation drive, the main body, emphasis, input sources and main types of innovation drive are different and have their distinctive characteristics [3]. Technology is the primary productive force, and production technology requires certain innovative ideas. In the process of innovation-driven transformation and upgrading of manufacturing, we need to pay attention to the problems in innovation-driven [4]. Implementing the innovation-driven development strategy is to promote comprehensive innovation with science and technology innovation as the core, adhere to the direction of demand orientation and industrialization, and adhere to the main position of enterprises in innovation.

The rise of a new round of information technology based on the Internet is profoundly affecting the development of all walks of life and triggering changes. At present, China's manufacturing industry is large but not strong, and the main innovation capability of enterprises is weak. The dependence on foreign technology is still high and the brand effect is weak [5]. The downward pressure on the economy has increased and the low-cost advantage has been lost. Many developing countries have also actively participated in the division of labor in the global industry, seeking to expand the international market space and expand the market. Countries are increasing their scientific and technological development and striving to seize a new round of victory in the new

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information technology revolution characterized by mobile Internet, Internet of Things, big data, cloud computing, etc. [6]. How to rely on technological innovation to promote the transformation and upgrading of China's manufacturing industry to enhance the status of China's manufacturing industry in the global value chain is the core problem facing China's manufacturing industry [7]. This paper studies the transformation and upgrading mechanism and evolution path of innovation-driven manufacturing from the perspective of global value chain. In order to improve the policy system of transformation and upgrading of the manufacturing industry, it will provide important support for improving the independent innovation capability of China's manufacturing industry, accelerating the transformation of economic development mode, and building an upgraded version of China's economy.

2. The Connotation and Mechanism of Innovation-driven

The improvement of the industrial structure is manifested in the process of upgrading the industrial structure through coordinated industrial development and promoting the transformation of the industrial structure from a low-level form to a high-level form. Innovation drive is not only technological innovation in manufacturing industry to a certain extent, but also includes system management and technological innovation. To a certain extent, it pays attention to various aspects of innovation in manufacturing industry and plays an important role in the transformation and upgrading of enterprises [8]. One of the most important problems existing in most manufacturing enterprises in our country is the lack of independent innovation. Most manufacturing enterprises in our country do not pay enough attention to the ability of independent innovation [9]. The essence of the transformation and upgrading process of manufacturing industry lies in the construction of a market-oriented and enterprise-oriented innovation and entrepreneurship ecosystem. From the perspective of global value chain governance, the industry chain is taken as the axis, and innovation chain is taken as the basis for optimal resource allocation. China's economy has stepped into a new normal stage of gearshift and economic transformation, which means not only the slowdown of economic growth, but also the transformation of economic growth power and economic development mode.

Structural benefit optimization is to improve the overall economic benefit of industrial system by rationalizing the correlation relationship of the same level structure, while transformation capability optimization is to upgrade traditional industries and form high-tech industries by upgrading the industrial structure. The rapid establishment, integration, reconfiguration and dissolution of Extension Manufacturing Capability Unit, as well as the rapid diffusion, rapid remodeling and rapid transformation of manufacturing capability. It can provide all kinds of knowledge service activities, such as acquisition at any time, on-demand use and payment, security and credibility, green and high quality, for the whole life cycle process of knowledge service through large data network environment. There are four kinds of flows in the diffusion process of extension manufacturing capability unit. That is resource flow, knowledge flow, capability flow and quality flow. The combined effect of these four streams enables large engineering equipment manufacturing systems to emerge rapidly expanding manufacturing capabilities in a short time. Fig. 1 is a model of Extension Manufacturing Capability Unit.

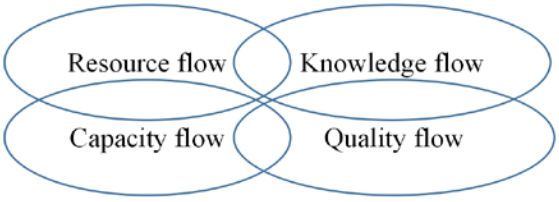

Fig. 1 Extension manufacturing capability unit model

Innovation and transformation of industrial structure mechanism is to transform traditional industries through scientific and technological innovation, promote the emergence of new industries, and then optimize the industrial structure. Only the thought of talents, knowledge and enterprise

system can satisfy the innovation of manufacturing industry and the transformation of manufacturing industry. These factors and resources, as the soft power driven by innovation, play an effective role in the transformation of manufacturing industry. Service optimization and upgrading refers to the innovation and upgrading of product function structure by manufacturing enterprises to meet the future needs of personalization and diversification, as well as the development trend of intelligent manufacturing and green manufacturing. The invention and application of new products, new materials, new processes and new science and technology have spread to many enterprises and even penetrated into other industries, creating new fields of production and forming some new industries. In innovation-driven manufacturing enterprises need to pay special attention to the innovation in science and technology. To ensure the innovation in science and technology can maximize the benefits and sustainable development of enterprises. Innovation drive is also related to innovation in enterprise system and market development, i.e. innovation mechanism in the process of marketing and related activities. To meet consumer demand, scientific and technological innovation has also promoted the upgrading of consumer goods, resulting in changes in the consumption structure and demand structure, further promoting industrial optimization and upgrading.

3. Innovation Drive and the Countermeasure of Manufacturing Industry Transition Development

3.1 Promoting the Core Competitiveness of Manufacturing Industry

Innovation to improve labor productivity mechanism refers to scientific and technological innovation to improve labor productivity, change labor employment structure, and then optimize the industrial structure. An important problem of collaborative management of big data knowledge service system in manufacturing industry is to make in-depth analysis of the big data contained in manufacturing industry. After sorting out the original input-output Table, the input-output Table of the compiling department is obtained. According to this classification method and the calculation formula of influence coefficient and induction coefficient, the influence coefficient and induction coefficient of each of the four industries can be obtained, as shown in Table 1.

Table 1 Industry influence coefficient and sensitivity index

Type	Impact index	Sensitivity index
Industry	4.468	14.212
Agriculture	12.655	17.358
Services	7.271	8.312
High-tech industry	8.533	10.365

At present, it is very necessary to transform and upgrade the manufacturing industry in the face of such a complex market environment. In the process of transformation, the use of innovation-driven assistance can make the transformation and upgrading of the manufacturing industry achieve twice the result with half the effort. The biggest problem facing China's manufacturing industry is the lack of independent innovation capability and research and development system integrating original innovation and integrated innovation. Scientific and technological innovation has improved the labor productivity of the industry, making the socially necessary labor time of the industry with higher labor productivity lower than the average socially necessary labor time, and the industry can obtain more profits [10]. The theory of global value chain governance emphasizes the opening and connection of the entire global market and highlights the interactive relationship between industries and enterprises. The essence of manufacturing transformation and upgrading lies in the value added of the value chain. If enterprises can attach importance to innovation-driven transformation and upgrading of enterprises, and establish and perfect independent innovation institutions and departments within enterprises, it will play a very key role in the development of enterprises and the sustainable development of enterprises.

3.2 Improving the Production Efficiency of Manufacturing Enterprises

Innovations in manufacturing science and technology can greatly guarantee the quality of products and effectively guarantee the quality of enterprise products. These products with certain quality can effectively enhance the competitiveness of enterprises after they are put into the market. Sustainable development is based on natural assets and coordinated with environmental carrying capacity. Sustainable development aims at providing quality of life and is compatible with social progress. Research in any discipline or field should be supported by scientific methods that meet the needs of its research objects and contents and are determined by its research purposes. At the same time, any scientific research method is not exclusive but universal. Fig. 2 is a schematic illustration of the general law of the development of resource-based cities.

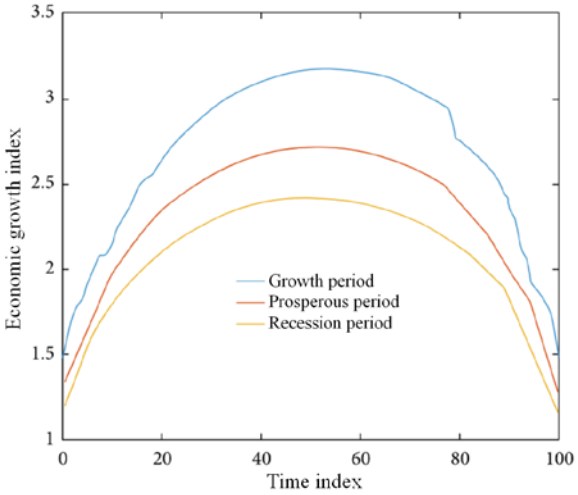

Fig. 2 General rules of resource-based urban development

The transformation of manufacturing industry mainly relies on the introduction of advanced technologies to realize the high-end transfer and upgrading of production process flow and products, improve the production and processing efficiency in the industrial value chain, and realize the mastery of key core technologies and the possession of higher value-added links. China's manufacturing industry needs to continuously improve its innovation competitiveness if it is to gain international competitiveness, gain a rising position in the global value chain, realize high profits or maintain its leading position. As our country has entered the late stage of industrialization, the market demand has changed from exuberant to weak, the traditional production capacity is highly surplus, and the market pressure is mainly concentrated on the demand for medium and low-end products that are too saturated. In the process of technology research and development, enterprises should improve the economic benefits and technical requirements of product production as much as possible under the premise of ensuring environment-friendly technology, so that the current manufacturing industry can better develop the enterprise society in the process of transformation and upgrading.

4. Conclusion

In line with the new trend of the global scientific and technological development frontier and the deep adjustment of industrial competition pattern, the transformation and upgrading of manufacturing industry is urgent. Innovation-driven strategy is the main engine of the transformation and upgrading of manufacturing industry in China. This paper starts with the analysis and exploration of the relevant connotation characteristics of innovation-driven, and puts forward the corresponding countermeasures based on innovation-driven manufacturing transformation according to the problems existing in the actual development process of manufacturing transformation and upgrading. There is fierce competition in the international market of economic globalization. No country or region can develop all industries to meet the needs of all

domestic or regional areas. It needs to rely on scientific and technological progress to increase its comprehensive competitive advantage. The conversion rate of high and new technology in China is far lower than that in developed countries. The channels of technology industrialization need to be developed. The immature business model of technology industrialization has seriously hindered the improvement of China's scientific and technological innovation capability. In the process of innovation-driven transformation and upgrading, the manufacturing industry should grasp the innovation of science and technology and the innovation of management system, and improve the working enthusiasm of employees within the enterprise by improving the production efficiency and quality of products. Under the background of macro-economic downturn, China's manufacturing industry transformation should be based on the global value chain governance mechanism, and jointly promote China's manufacturing industry to the middle and high end.

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