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Analysis of the Trend and Countermeasures of the Development of Machinery Industry Under the Background of the New Era

Chuang Fan, Xiao Dong Huang

Machinery Industry Education Development Center, Beijing, China

Email address:
fanchuang@sina.com (Chuang Fan)

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Abstract: In the new era, our country's machinery industry has been in the forefront of the world, and has played an important role in promoting the national economic and social development. The development of machinery industry has made great achievements, but also faces many unprecedented challenges. In the new era, how on Earth should China follow the road of new-type industrialization and realize the Chinese Dream of Chinese Dream on the basis of creating a powerful country, is to promote the new era of socialist practice with Chinese characteristics in-depth development of the key must be resolved. Through mining, combing and inducing the research data of the development of our country's machinery industry in the new era, this paper interprets the National Industrial Strategy and the development characteristics of our country's machinery industry in the new era, this paper probes into the achievements and experiences of the equipment manufacturing industry during the 13th five-year plan period, and by using descriptive statistics to collect and sort out the relevant data, puts forward that the future development of the machinery industry will face new challenges and opportunities, in the new era, the development of machinery industry has been placed in the strategic position of the national revitalization of the new momentum, and new forms of business have been constructed to optimize the industrial environment, pay attention to the deepening of the strategy of cultivating the spirit of" Craftsmen of great powers", so that the contribution potential and value of machinery industry will be brought into full play, the high-quality development of machinery industry with Chinese characteristics in the new era will surely usher in a grand prospect of countermeasures and suggestions.

Keywords: Development of Machinery Industry, Industrial Upgrading, Digital Industry, Service-Oriented Industry

1. Introduction

The machinery industry is an important part of the industrial system of China's real economy, a pillar industry that reflects China's economic strength, and provides equipment and technical means for the development of the national industry. The industry has become a large industrial country with complete categories, strong strength and large scale, ranking at the forefront of the world. The industrial economy is leaping from high-speed growth to high-quality development [1]. The economic development is in a period of periodic adjustment. The functions and missions of the machinery industry are also changing to a new development pattern.

2. The Connotation of the Development of Machinery Industry in the New Era

The development of the machinery industry with Chinese characteristics in the new era has made my country's economic strength more prosperous, and its industrial strength has occupied the center of the international stage., strong and stable" development orientation, the industrial operation efficiency and benefits have been significantly improved [2], the sustainable development capacity has been enhanced, the scale growth momentum has become more stable, and the industrial structure and format have been fully optimized. Huge contribution and value connotation.

3. New Era Machinery Industry Trends

This judgment in the new era is made in the context of the weak recovery of the world economy and the intensification of global problems. At present, my country's industrial industry is in the stage of accelerating the transformation to high-quality development, in order to realize the "14th Five-Year Plan" and an ambitious goal for 2035.

3.1. Comprehensively Enhance the Technological Innovation Capability of Industrial Manufacturing

More than 40 years of China's reform and opening up have been a large-scale innovation action. At present, the economic development prospects of my country's machinery industry are improving and it has entered a stage of high-quality development. However, the overall development level of the industry is not sufficient and balanced, and there are many shortcomings and weaknesses. Improve the basic capabilities of the industry, drive the gradual transition of the industrial chain from the low-end to the high-end of the industrial chain, shape my country's industrial high-quality brands, enhance the status of international industrial brands, and use the strategy of integration of production and education to accurately train craftsmen in great powers [3], and stimulate the development of professional skilled talents. Scientific and technological innovation potential, build an industry standard system of new processes, new technologies and new standards, promote the pace of digital transformation and upgrading of enterprises, promote the machinery industry to adapt to new development in advanced fields, and improve the overall high-quality level of my country's machinery industry and the international industrial market.

3.2. Stimulate the Industrial Linkage Effect and Create a Sustainable Development Ecosystem

Unblocking the interaction between supply and demand in the linkage industry of the industrial chain is an effective means to solve the phenomenon of industrial dispersion and development convergence and low-level repeated construction, strengthen the new development concept throughout the entire process of the equipment manufacturing field, formulate a high-end industry coordinated development strategy, and insist on service The goal of society is to integrate into strategic emerging industries, realize the expansion and extension of cross-industry and cross-domain industrial chains and value chains, coordinate and integrate cross-industry and cross-regions, make up for shortcomings and improve international industrial positions, and form a comprehensive coordination function. To achieve the strategic goals of carbon peak and carbon neutrality, and promote model innovation and development model transformation.

3.3. Digital Economy Integrates Industrial Services to Establish Precise Sharing of Resources

Due to the lack of transformation and upgrading of traditional industries, a large number of backward production capacity have been generated, resulting in waste of production costs and resources. The digital economy breaks through the limitations of space and fully integrates huge demand data, subverts the traditional production model through high-end information technology, provides real-time insight into the nuances of industrial demand and market behavior, accelerates the transformation to advanced intensive production methods, and establishes a new development concept. A green and low-carbon industrial ecological cycle model. Intelligently organize supply chains and production lines, and redesign combined modules to meet the different needs of users [4]. On the basis of the smooth domestic circulation, it can more accurately tap domestic and foreign market demand, seize opportunities, empower the industrial chain and value chain, make use of the national digital industrial policy, connect the leading enterprises in the machinery industry with international economic and trade rules, and create a new era of China A new development pattern of dual circulation of characteristic industries.

4. Contribution Analysis of New Machinery Industry

During the "Thirteenth Five-Year Plan" period, the overall economic operation tends to be stable, the industrial scale shows continuous growth, the industrial foundation has been strengthened, and the independent innovation of industrial operation mode has been optimized, laying a solid foundation for the strategic development goal of "manufacturing a strong country" [5].

4.1. The Scale of the Industry Continues to Grow, and the International Transfer of the Industry Is Promoted

According to statistics from the end of 2020, there are 92,199 enterprises above designated size in my country's machinery industry, and the total assets of enterprises above designated size account for 20.9%. During the period from 2013 to 2020, the sales revenue of my country's machinery industry has achieved successive years from 7524.019 billion yuan to 14,961.62 billion yuan. Climbing up, the proportion of GDP continues to grow, emerging industries have become new growth points of tax revenue with an average annual growth rate of 21.2%, and the international service trade volume has ranked second in the world for five consecutive years. My country has basically achieved industrialization in 2018. In order to adapt to the upgrading of industrial needs, the entire industry has accelerated the pace of innovation. With the advancement of digital industrialization and industrial digital transformation and upgrading, the innovation capability of the machinery industry will undergo rapid qualitative changes, providing the possibility to climb to the high end of the global value chain.

4.2. The Innovative Development of Strategic Emerging Industries Continues to Deepen

During the period from the "Twelfth Five-Year Plan" to the "Thirteenth Five-Year Plan" period, my country's strategic emerging service industry increased by 15.1% annually. Based on the development strategy of "introduction, digestion, absorption, and innovation" [7], the technological innovation system has rapidly improved and the average annual increase Among the three major categories, the added value of equipment manufacturing industry increased by 39.9% year-on-year, accounting for 77.5% of the national industrial capacity utilization rate [6]. The development potential of strategic emerging industries is huge. At the end of 2020, the state approved the construction of key laboratories and industrial engineering research centers. A total of 48 It is an innovation platform that realizes the R&D ability to master the core technology of the industry, transforms scientific and technological achievements, solves the shortcomings of industrial development and common problems such as the basic key components of industrial equipment manufacturing and contributes to the development of emerging industries and the industrialization and innovation of scientific and technological achievements. Ability to improve, expand the room for growth.

Table 1. *Year-on-year cumulative industrial added value.*

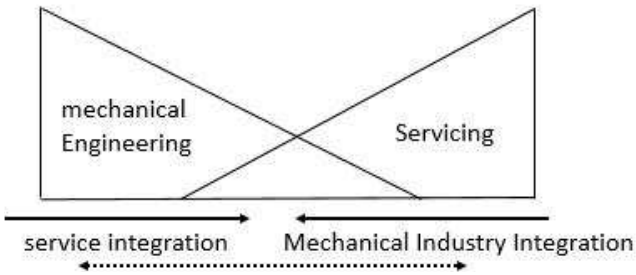
Cumulative year-on-year % of industrial added value (manufacturing)			
period	**Emerging Technology Industries**		**Equipment manufacturing**
2019.2	5.6	6.4	
2019.3	7.2	7.8	
2020.2	-15.7	-14.4	
2020.3	-10.2	-3.8	
2021.2	39.5	49.2	59.9
2021.3	27.3	31.2	39.9

Table 2. *Output of some products of the machinery industry in the first quarter of 2021 and year-on-year.*

unit	**metal cutting machine**	**vehicle**	**Power Equipment**	**Industrial robot**	**new energy vehicles**	**excavator**
	thousand	**thousand**	**thousand kilowatts**	**thousand**	**thousand**	**thousand**
Production in the first quarter	14.4	638.3	3131.9	7.87	55.3	5.84
2018 YoY	9.92%	-10.49%	36.94%	138.89%	225.29%	114.01%
2019 YoY	19.01%	1.17%	68.3%	143.47%	119.44%	72.47%
2020 YoY	100%	83.9%	67.4%	127.20%	349.59%	87.87%

4.3. A New Digital Industry Pattern of Service-Oriented Manufacturing Is Taking Shape

In the context of the digital economy era, the more traditional machinery industry presents an obvious "service-oriented" feature. The integration of industry and mathematical economy provides favorable conditions for the digital transformation and upgrading of the machinery industry. The investment in industrial digital technology research and development has broken the intelligent manufacturing bottleneck of high-end industrial design, smart chips, ultra-precision machining, additive manufacturing and other artificial intelligence "hard technologies". The application in the whole process of industrial manufacturing has greatly improved industrial process standards and quality. According to statistics, during the "13th Five-Year Plan" period, the quality inspection results of machinery industry products were close to international advanced standards, and the quality pass rate reached more than 93%. Breakthroughs have been made in basic common technologies, and technologies such as digital twins and virtual simulation have played the cost of "trial and error" and "correction" in the industry, realizing green manufacturing. The stickiness of cooperative organizations greatly improves the synergy efficiency of upstream and downstream enterprises in the industrial chain, and forms a comprehensive new advantage of digital advantage manufacturing.



Source: Baines and Lightfoot, 2003

Figure 1. *Integration of manufacturing and service industries.*

5. Resistances and Opportunities in the New Development Background

5.1. The Digital Machinery Industry Is the Driving Force for the High-Quality Development of the Industry

During the "14th Five-Year Plan" period, the digital industry as the representative of the key technological changes will make rapid progress. The industrial competitive advantage based on low-cost and large-scale production will be transformed into the high-quality and high-efficiency transformation of integration capabilities and refined production, and the industrial competition will be

reconstructed. Advantages, from the original manufacturing advantages to comprehensive new advantages, enhance the resilience of the machinery industry chain, and enhance the international industrial strength.

5.2. Technological Innovation Is the Necessary Basis for Optimizing the Industrial Structure

The upgrading of the industrial structure can promote high-quality economic development, effectively solve the cost of human and material resources, and improve the accuracy and stability of industrial standards [5]. The digital industry promotes the internal organization of traditional machinery manufacturers, product users, and upstream and downstream related organizations in the industrial chain. The real-time and fast information exchange between them has greatly helped to solve the long-term structural fundamental problems of my country's machinery industry.

5.3. Optimizing Industrial Policies to Improve Industrial Technical Capability

Innovative industrial technology is a technical method for transforming a series of creative activities in the industry. My country has developed into the world's largest industrial country and the second largest economy. However, there is still a lot of room to improve the ability of independent innovation, and it is necessary to increase investment in production, education and research. To provide more financial subsidies, tax relief and credit support for enterprises' industrial technological innovation activities, and to focus on the research and development and innovation of basic and applicable core technologies in key areas, from focusing on growth to focusing on "strengthening the foundation and attacking the high-end" The core competitive advantage of the machinery industry is no longer a single-dimensional technical capability, but a transformation from the overall industry innovation input and innovation output to the complex multi-type composite industry innovation capability At present, the innovation ability of my country's machinery industry still needs to be greatly improved, and the resulting role has not been adequately supported for industrial transformation and upgrading.

5.4. Opportunities Brought About by the Change in the Advantages of the International Division of Labor

The machinery industry conforms to the development trend of the world's manufacturing industry and has been deeply integrated into the international division of labor system. It seizes the favorable opportunity to build a strong manufacturing country, encourages the adoption of innovative business models and foreign cooperation methods, and uses the international market to promote the continuous improvement of industrial technology in the entire industry [8-10]. The development level of service quality, changing the current status of international division of labor, and realizing the transformation of competitive advantages.

6. Countermeasures and Suggestions for High-Quality Development

To realize the strategic task of "Made in China 2025", the transformation and upgrading of the equipment manufacturing industry itself is the top priority. The long-term goal of the machinery industry is to take the opportunity of "domestic cycle" and adhere to the new development concept to deepen the supply-side structural reform and stimulate Industrial innovation vitality of the whole machinery industry.

6.1. Strengthen the Top-Level Design of New Formats to Boost the New Pattern of the Industry

Under the urgent requirements of the transformation of my country's economic growth momentum and the transformation of development methods, the machinery industry must firmly grasp the development orientation of "fast, high, good, strong and stable", that is, the rapid growth of advantageous brands, high operating efficiency and Efficiency, better industrial structure and format, strong sustainable development capability, and relatively stable scale growth momentum. It is even more necessary to play a leading role in promoting the advanced industrial base and the modernization of the industrial chain, and to play a greater role in creating a new pattern of my country's foreign economy.

6.2. Build a Modern Low-Carbon Industrial Ecosystem

Attaching great importance to the improvement of the basic capabilities of the machinery industry, aiming at the weak links of the foundation that constitute the hidden dangers of industrial safety, with the industrial foundation reengineering project as the starting point, with the construction of the standard system as the support, the implementation of quality improvement actions, to create an advantageous national brand, for the construction of machinery industry A solid foundation has been laid for the modern industrial system. Focusing on the new characteristics, new tasks and new requirements of the new stage of the development of the machinery industry, strengthen the overall promotion of standardization work, give play to the basic, leading and strategic role of standardization, and improve the degree of fit between standardization and the development of the machinery industry. Give full play to the advantages of the domestic super-large market, aiming at the main direction of "improving the modernization level of the industrial chain", forging long plates, and improving the international competitiveness of the industry [11].

6.3. New Pattern and New Model of Service-Oriented Manufacturing

Under the premise of leading the digital economy, promote the dynamic real-time adjustment of the upstream and downstream of the industrial chain of the whole industry,

accurately match the supply and demand of key resources such as the industrial situation, market, and industry talents, form the digital transformation of the industrial chain and value chain, and realize the mechanical industry and digital The transformation of the economy from "following" to "running side by side", the driving force in terms of industrial demand mainly comes from the diverse changes in demand of final consumers, environmental pressures, energy conservation and emission reduction tasks, and downstream manufacturers' higher requirements for equipment performance [12]. Make full use of the new generation of Internet technology and embed it into every link of industrial production and manufacturing, and the whole process of service informatization, intelligence, and green manufacturing has become more efficient and safe. Actively [13] promote the "Internet+" policy concept, making informatization, intelligence, and greenization a new hot spot for innovation and investment in the machinery industry, forming a new era of Chinese characteristics of the machinery industry ecological pattern.

6.4. Comprehensively Enhance the Competitiveness of the Internal and External Environment

Comprehensively establish new advantages of industrial strategy, encourage industry leading enterprises to take the lead in forming innovation consortia, in order to improve the overall efficiency of the innovation chain of the machinery industry, speed up the transformation of digital industry achievements, and enhance the "multiplier and superposition" effect of new digital technologies on the upgrading of the machinery industry [14, 15]. Stimulate the innovation vitality of talents, improve the environment for talent development, pay attention to the research on industrial technology and cutting-edge technology, deepen the integration of production and education, strengthen the cooperation and sharing of scientific and technological resources, strengthen the strategic scientific and technological strength, improve the basic capabilities of the industry and the level of the overall industrial chain, and encourage market players to develop The decisive role in the allocation of resources, and strive to take the lead in the complex manufacturing competition.

7. Conclusion

The development of the machinery industry in the new era has been placed in a strategic position for the country to revitalize new kinetic energy, build new formats to optimize the industrial environment, improve industrial economic planning and policy systems, help accelerate economic recovery, stimulate the innovation vitality of market players, and let the market mechanism truly play the role of survival and elimination. It will actively promote digital transformation and upgrading, promote the integration of existing scientific and technological forces into national strategic scientific and technological forces, and form innovative joint forces to create a more level playing field for the competitive industry of the machinery industry, create a complete industrial ecology, and attach importance to cultivating" With the continuous deepening of strategies such as the "Great Power Craftsman" spirit, the contribution potential and value of the machinery industry will be brought into full play, and the high-quality development of the machinery industry with Chinese characteristics in the new era will surely usher in a grand prospect.

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