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Research on the Transformation and Development of the "5G+Intelligent" Model of the Printing Industry

Wenjun Guan
Shanghai Publishing and Printing College, Shanghai, China

Abstract:

Intelligentization has become one of the development directions of the printing industry during the "13th Five-Year Plan" period. The construction of intelligent printing is mainly about the in-depth integration of information technology and printing technology. With the opening of the first 5G test station in China, the 5G industry has begun to develop rapidly. The release of "Made in China 2025" heralds that China's manufacturing industry has entered the era of intelligence. In the 5G era, my country's printing industry needs to get rid of the inertial thinking of traditional production models and find a new development path to adapt to this era as soon as possible. The "Thirteenth Five-Year Plan for the Printing Industry" clearly defines the development goals of my country's printing industry and proposes to accelerate the pace of green, digital, intelligent, and integrated development. The "5G+Intelligent" model will promote the transformation and upgrading of China's printing industry, cater to the development of the times, and lay a solid foundation for the better development of the printing industry in the future. Based on the integration of 5G technology and intelligent manufacturing, this article analyzes the feasibility of the "5G+intelligent" model to promote the development of printing enterprises and the problems that need to be solved in view of the status quo.

Keywords: *Printing industry, 5G technology, Intelligence*

I. INTRODUCTION

The printing industry is a traditional industry dominated by light industrial products. The earliest engraving and printing was invented in the Tang Dynasty. It was inspired by seals, rubbing, and printing and dyeing techniques. The movable type printing invented by Bi Sheng in the Northern Song Dynasty is even more prominent. Into one of the four major inventions in our country, the printing industry has been developed because of the inheritance of culture for

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thousands of years. Printing technology is also changing rapidly with the development of science and technology. With the in-depth exploration of the manufacturing industry in the "intelligent +" field, the printing industry has entered a new era of "5G" development where opportunities and challenges coexist [1]. The 5G era has accelerated the development of big data and artificial intelligence. If the printing industry wants to develop, it must keep up with the pace of the times. It must get rid of the inertial thinking brought by the traditional production model, and explore the development path of enterprise intelligent transformation under new business conditions in order to be able to adapt to intelligence. The arrival of the printing age.

II. FEASIBILITY ANALYSIS OF "5G+ INTELLIGENT" MODE IN PRINTING INDUSTRY

2.1 Background and Policy

The scientific and technological revolution inevitably leads to the industrial revolution. The third industrial revolution promoted the development of industry towards automation and digitalization. In April 2013, Germany proposed the concept of Industry 4.0, the era of using information technology to promote industrial transformation, implying the manufacturing industry Usher in the era of intelligence. In May 2015, the "Made in China 2025" issued by the State Council, its core goal is to move from "manufacturing" in China to "intelligent" manufacturing in China.

In April 2017, the State Administration of Press, Publication, Radio, Film and Television issued the "Thirteenth Five-Year Development Plan for the Printing Industry" which clearly stated that "promote my country's printing industry to accelerate the development of'green, digital, intelligent, and integrated', and promote the industrial structure. Optimize and upgrade, improve the level of large-scale and intensive specialization, and realize the initial transformation from a big printing country to a printing power." Goal [2].

2.2 The Inevitability of the Development of the "5G+Intelligent" Model of the Printing Industry

With the continuous development of information technology, the content and process complexity of modern communication technology and printing technology are getting higher and higher. The concept of intelligence has gradually penetrated into the printing industry. The intelligence of the printing industry is inevitable for the development and upgrading of the printing industry stage. Whoever implements it first can occupy the first opportunity and

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commanding heights of production.

Facing the development of Internet technology and the impact of new media technology, the printing market demand has undergone major changes. The intelligent development of the printing industry is a spiraling process of advancing the intelligent manufacturing of printing, integrating intelligent means and intelligent systems and other emerging technologies, and is a new stage of the development of printing automation and digitalization. Based on the dual attributes of the printing industry, the construction of intelligent printing in my country is not only a need to strengthen the construction of propaganda and ideological positions, but also an integral part of the practice of "Made in China 2025". Therefore, the report clearly puts forward “to strengthen the position construction as the goal, to improve quality and efficiency as the center, and to focus on the in-depth integration of information technology and printing technology as the main line” [3]. The basis of development. China has the most complex printing and packaging production and operation methods, and has the world’s largest printing volume market. The core goal of "Made in China 2025" is the intelligent development of the entire industry. The printing industry must follow the national development strategy, and intelligent printing is imperative.

"4G changes life, 5G changes society" [4]. 5G's advantages of low latency, no mutual interference, high reliability, and wider deployment coverage can provide better wireless transmission for intelligent printing. Benefiting from the development of 5G technology, remote communication and transmission have become more convenient, stable and high efficiency, greatly improving the sensitivity and stability of the high-speed transmission and processing of a large amount of data in printed files. 5G will expand from the original 4G consumer-oriented applications to industrial-oriented applications.

2.3 "5G+Intelligent" Model Boosts the Transformation and Development of Printing Enterprises

The realization of intelligence in the printing industry is an inevitable trend and an inevitable choice for the transformation and upgrading of enterprises. Intelligent printing manufacturing runs through all links of printing manufacturing such as design, production, management, and service. It has self-perception, self-learning, self-decision-making, self-execution, and A new production method that adapts to other functions. It is necessary to use intelligent means to promote the transformation and upgrading of printing in R&D and design, management decision-making, processing and manufacturing, and market development.

Printing intelligence is an advanced production method oriented to the full production cycle

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of printing. It emphasizes the level of industrial development. The installation of advanced printing equipment and the implementation of partial information construction cannot be equated with the realization of intelligent manufacturing; intelligence is informationization, digitalization, and the ultimate goal of digitalization, and the core goal of intelligent construction is to optimize the production process, reduce costs and increase efficiency, and enhance corporate competitiveness. First of all, we must sort out the work process of the enterprise, then use information technology to solidify the process according to the characteristics of the enterprise, configure equipment and personnel according to the production management process, and finally combine the network and automation equipment to carry out intelligent links and realize intelligent construction.

The combination of 5G network and intelligent technology will promote the transformation of the printing industry. 5G will completely change the way printing works. It can connect multiple devices, solve device "islands", realize continuous communication between devices, and meet the real-time requirements of big data files. Transmission and intelligent processing, so as to achieve a high degree of connection, this is the main driving force of intelligent printing.

III. CONCLUSION THE STATUS QUO OF THE DEVELOPMENT OF THE "5G+ INTELLIGENT" MODEL OF THE PRINTING INDUSTRY AND WAYS TO BREAK THROUGH

3.1 The Status Quo of My Country's Printing Industry

Judging from the status quo of my country's printing industry, the overall level of intelligence is still relatively low, and there are only scattered and partial applications of intelligence-related technologies, and there are few complete cases in a system. If the intelligence level of my country’s printing industry is measured according to the concept of German Industry 4.0, then my country is still in the stage of transition from industry 2.0 to industry 3.0 [5]. The 2015 “China Manufacturing Industry 4.0 Process” report also mentioned that “most of China’s Manufacturing companies are still hovering between Industry 2.0-3.0.". It is really just the beginning for half of Chinese manufacturing companies to embrace Industry 4.0." Therefore, it is still in a period of popularization of digitization, a period of promotion of network, and a period of exploration of intelligence. This also puts forward new requirements for the advancement of the intelligent construction of my country's printing industry, which should meet the needs of intelligent construction of different types and levels of printing enterprises.

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The printing industry is a typical discrete manufacturing industry. Most of them do not have their own fixed products, and the product processes are complex and customer orders are changeable [6]. Therefore, the average penetration rate of ERP use is far lower than other industries. The high degree of automation of a single device simplifies the process and liberates manpower. However, the connection and coordination between the device and the device and the device and the software system are far from enough.

However, some companies have reached a certain level of automation and digitization in some parts of the production process. Some large and medium-sized printing companies have carried out digitization and network construction earlier, introduced ERP, MES systems, etc., purchased advanced automation equipment, and developed intelligent logistics. With a good foundation of intelligence, individual companies have the embryonic form of intelligent manufacturing.

3.2 Dilemma of Transformation and Development

The pain point of the intelligent upgrade of the printing industry is mainly reflected in the transformation of the traditional business model. [7]

The geographical gap is large, and the technical concept is backward. China's printing industry is low in integration, and the level of enterprise development is quite different. There are more printing and packaging enterprises that are backward in production technology, outdated in management concepts, and single in development mode. Even the level of national printing demonstration enterprises is also uneven. The overall intelligent construction of my country's printing industry presents a dot-like distribution, with a low degree of industrial agglomeration, and the discretization and fragmentation of the regional layout are obvious.

The level of standardization and standardization is not high. Intelligent construction is an important way to practice lean manufacturing, just-in-time production, and reduce waste in all aspects of production. However, my country's printing companies have experienced a period of crazy development with high returns. Compared with other manufacturing industries, their production methods are relatively extensive. The low level of lean management and lean production, the insufficient openness of the production equipment interface, the uneven software application level, and the low standardization and standardization of the printing production process have resulted in the weak foundation of the intelligent construction of my country's printing industry.

The number of compound talents is not large. On the way to the direction of intelligence,

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the biggest shortcoming of enterprises at the moment is that they do not have enough understanding of the important role of software in realizing intelligence. The three basic paradigms of digitalization, networking and intelligence are all related to IT technology. It is closely related, and there are very few programmers who are familiar with the whole production process. This is precisely a hurdle that enterprises cannot get around in the direction of intelligence. My Country's existing printing colleges and universities generally face practical problems such as insufficient enrollment, insufficient students' confidence in the industry, and insufficient professional interest. At the same time, the development of the existing skill-based talent training system is relatively lagging, and it is difficult to meet the industry's various needs for intelligent construction talents. Therefore, the lack of talents is an important factor hindering the intelligent development of the printing industry.

Lack of funding. Companies deploying 5G networks, introducing automated equipment, and digitizing processes are indispensable for a large amount of capital investment. In recent years, printing companies have faced factors such as rising prices of consumables and increased labor costs, and the funds for development on the road to intelligence are very limited.

3.3 Breakthrough Method

Those at different levels can be upgraded to intelligent upgrades in layers or at one time. Like traditional production methods, an ERP system can be added [8]. For existing ERP system, MES system can be added and connected with ERP. If both systems are available, an intelligent system can be added. With the upgrading of software and hardware of printing equipment, 5G also requires the introduction of more compound talents. This process of transformation and development is an opportunity and a challenge for enterprises. Encourage employees to watch more industrial exhibitions, do more projects, and strengthen their understanding of intelligence. Strengthen middle-level leaders who are familiar with the production management of the printing industry and cooperate with companies with certain experience in informatization, lean production, and automation. Strengthen the informatization software products with production process management as the core, and solve the informatization problem of the printing industry as an extremely discrete industry. Sort out the company's products, send out the products that are not good at, optimize the production process + technological transformation + automation upgrade for the good products, and create their own barriers in the field of good products.

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IV. PROSPECTS

It is estimated that by 2025, the number of 5G connections in China will reach 400 million, accounting for 30% of the total number of global connections [9]. By 2050, one-third to more than half of the world's jobs will be connected to artificial intelligence solutions [10].

5G is not only an increase in network speed, but also a further step in the interconnection of all things, accelerating the popularization of the Internet of Things in the entire industry. In the future, it will combine cloud and artificial intelligence technologies to promote social change and enter a intelligent society where all things are aware. In the long run, 5G technology can also help the printing industry save energy and reduce consumption, improve energy utilization, and promote the green and environmental protection of the printing process.

Driven by 5G, a large number of revolutionary application scenarios will appear in the printing industry in terms of production and maintenance. The massive data collection and processing brought by 5G technology can provide richer basic information for printing production and expand more application areas.

V. CONCLUSION

The printing industry’s information supply service capabilities and users’ application capabilities are relatively poor. Compared with manufacturing industries such as biopharmaceuticals, food production, and automobile production, the printing industry has a long road to intelligent production. I believe that with network technology and digitalization with the development of intelligence, through learning from the advanced experience of the leading manufacturing industry, the printing industry will continue to make breakthroughs and innovations, truly realize the intelligent upgrade of printing production, optimize process management and equipment transformation, and fully realize information intelligence based on 5G technology. Control technology to realize the transformation of the industry.

The China Printing Industry Association stated that it will continue to strengthen industry actions, assist the government in formulating relevant industry policies and regulations, formulate development plans, strive for a reasonable layout of national laboratories in the industry, and guide large enterprises to increase investment in R&D centers and develop intelligent manufacturing in enterprises. Experiment and promote. Through the industrial application of new equipment and new technology, and the industrial promotion of new models, the intelligentization of the printing production process is promoted, so that printing intelligent manufacturing has become the focus and development area of national intelligent

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manufacturing. This will not only help printing industry planning and design research to obtain strong intellectual support, but also help printing companies obtain various types of financial support in the promotion of intelligent construction, and enjoy policy dividends.

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