Research on the Status Quo and Development of Digital Printing Technology

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Abstract. With the continuous development of information technology in China, digital printing technology has also been developed steadily. It has also been widely used in China's printing industry, and has created good economic and social benefits. However, there are still many problems in the application process of digital printing technology, which requires relevant technical personnel to strengthen the research in this area, and carry out the necessary reform and optimization of the existing digital printing technology on this basis. This paper mainly analyzes the status quo and development of digital printing technology.

1. Introduction
Compared with the traditional printing mode, the digital printing technology can effectively solve various problems existing in the printing mode, and can perform printing work after the graphic information which has been effectively processed by the printing system, for some has large demand for batch printing can also be completed promptly and quickly, and it has the advantages of high efficiency, convenience, energy saving and environmental protection. It can also fully meet the needs of printing in different places, and it is also very important for the further development of China's printing industry.

2. A Brief Analysis of the Characteristics of Digital Printing Technology

2.1 High Efficiency and Flexibility
When printing by digital printing technology, it is also possible to omit the intermediate plate-making process and the transmission link of the traditional printing mode, which can promote the work efficiency of the printing work to be greatly improved. In the traditional printing mode, it takes a few days of work time to complete from the receipt of the print job to the final printed product. Through the application of digital printing technology, a large amount of printing time can be saved, printing efficiency can be effectively improved, and unnecessary waste of printing materials can be avoided, thereby obtaining good economic and social benefits [1]. In the process of printing graphic information, the digital printing technology can also adjust the graphic information in a timely and effective manner, which makes the printing work flexibility to a certain extent. With the continuous development of digital printing technology, the flexibility of the printing process has been effectively improved, and the printing of different information contents can be performed on two adjacent printed materials, which makes the printing effect more colorful.

2.2 Fully Digital
All the printing processes in the digital printing technology are operated by means of electronic
information technology. It is also possible to make and edit the graphic and text information that needs to be printed through a computer, and to print plates and films in a specific printing process. The dependency of the backplane tool will also be greatly reduced. It can be said that digital printing technology relies entirely on digital and technological information technology to work. It only needs to be operated on a computer to obtain good graphic printing effects.

2.3 Without Time and Space Limits

Compared with traditional printing technology, digital printing technology can break the limitations of traditional printing in time and space through the application of information technology such as the Internet [2]. In the traditional printing work, a single printing mode is adopted, the printing process is too cumbersome, and a large amount of printing time is required. In the face of a relatively large number of printing jobs, there are also relatively low printing quality and printing speed. The problem is the speed is too slow, and it is difficult to fully meet the requirements of printing efficiency, which is also the limitation of time in the traditional printing mode. In addition, in the traditional printing work, each printing process has a close correlation, it is difficult to realize off-site printing, and there are certain limitations in space. Through the application of digital printing technology, it is possible to use the Internet or LAN to make the original information and original process timely, it also can effectively transmit the graphic information which is printed through network technology. The convenience make it a good breakthrough in the time and space limitations of the traditional printing mode, which makes the printing convenience and printing efficiency significantly improved.

2.4 Environmental Protection

At drupa2016, Lekai Huaguang exhibited products such as TP-U type thermal CTP version, TP-G type heat-free thermal CTP version, and PPVG low-chemical purple laser CTP version. For printing companies, the use of the process-free CTP version not only reduces processing, reduces processing costs, improves plate quality, but also reduces environmental pollution caused by waste generated in the ordinary plate making process. At the same time, in the digital printing process, the number of production printing can be limited, and the pattern of printing can be used to ensure the reasonableness of the printing quantity to avoid unnecessary waste. In the face of large-volume printing tasks, the application of digital printing technology can achieve strict control of the number of printing, which greatly reduces the waste of paper and ink, and can effectively avoid pollution to the external environment, so digital printing technology also has good environmental performance.

3. Analysis on the Status Quo of Digital Printing Technology Development in China

With the continuous development of China's science and technology, digital printing technology has also been widely used. However, compared with some developed countries in foreign countries, China's digital printing technology is applied late, and there are still many shortcomings in the specific application process. This requires continuous innovation and optimization of existing digital printing technology to meet the specific development needs of China's printing industry.

3.1 Development Status of Digital Printing Technology

The digital printing technology is mainly a new printing process in which the computer directly prints online through the printing device [3]. As early as more than 20 years ago, China has widely applied computer technology in the printing industry. Although it was only used in the prepress information processing process, it still promotes the development of China's printing industry in the direction of digitalization. At present, China's printing industry has also begun to apply a variety of new printing technologies and digital technologies, which has greatly improved the adaptability of printing work and printing efficiency, and can meet the needs of printing work in the market.

In recent years, with the continuous development of China's printing technology, the digital printing work is no longer limited to the original graphic printing work, but it is developed into the direction of more specialized printing machines. In the process, the digital printing range has been
greatly expanded, and the printing materials have also been developed from the original special printing paper toward a variety of packaging printing materials, which can well break the limitations of traditional printing work. It also has a good positive significance for the further development of China's printing industry. In modern digital printing technology, the difference between digital printing and packaging printing has been greatly reduced, and the level of packaging printing technology has also been greatly improved, and a series of printing technologies such as 3D printing have been extended.

3.2 Development of Digital Printing Equipment
Although there are many shortcomings in the application process of digital printing technology in China, the improvement of science and technology also provides enough technical support for the application of digital printing technology. Modern digital printing technology can also effectively connect color printers, and the number and variety of specialized printing equipment has also been greatly improved. It can be said that China's digital printing equipment is in the process of continuous improvement and improvement, and in a short period of time, it has realized the development from the traditional process to the semi-automatic printing process and then to the all-digital printing process. In the existing digital printing technology, one-time imaging can be realized without using a printing plate, and the modular design can also carry out a diversified combination of printing methods, so that only two devices of a roller and a roller cover are needed in the printing process. The replacement work enables the effective printing of products of different styles and different specifications. It also has an easy-to-use mode that can effectively solve the manual problems required in traditional printing work.

In addition to the improvement of the specialization level of printing hardware, China's printing materials have also been improved and refined to a certain extent, and in the digital printing technology, the detailed classification of professional printing consumables has been carried out, so that the printing work is no longer limited. Traditionally we used printing papers to meet diverse printing needs. Therefore, China's digital printing technology has been widely used in recent years, printing equipment and printing materials are constantly updated and improved, and China's printing industry has been further developed.

4. Problems in Digital Printing Technology

4.1 The Printing Process is Not Fully Environmentally Friendly
In recent years, China's digital printing technology has developed rapidly, and has extended many types of digital printing modes. However, in the application process of some printing modes, it will also cause a certain degree of environmental pollution. As an example of gravure printing, gravure printing occupies a core position in the packaging and printing industry in China. The printing method has a wide range of printing materials and is printed. With high quality standards and high technical content, it has been widely used in printing in many industries. Through the combination of gravure printing and other special techniques, it can also be widely used in securities printing such as banknotes and stamps. It can be said that gravure printing products are closely related to people's daily life and have great development prospects [4]. However, in the printing method, some objects that cause serious pollution to the surrounding environment are also emitted, and it is difficult to meet the specific needs of China's relevant environmental protection policies. This also requires the relevant technical personnel to fundamentally find out and solve various factors that cause environmental pollution, thereby improving the environmental performance of digital printing.

4.2 The Performance of the Printing Industry Lacks Rationality
At present, most of the printing industry in China uses some low-end equipment to carry out related printing work. The digital level is insufficient, and the printing quality and printing efficiency are difficult to fully meet the development needs of the society. Through the application of high-end
printing equipment, the printing effect can be effectively improved, which can also play a good guiding role for the further development of the printing industry. However, some printing enterprises in China still have insufficient investment in printing equipment, and there are serious shortages of high-end equipment, which has led to the unreasonable structure of the entire printing industry, which has produced a steady and stable development of China's printing industry. Therefore, China's printing industry needs to further increase the promotion of high-end printing equipment, and then replace the traditional low-end equipment for various printing production work, in order to obtain good economic and social benefits.

4.3 Insufficient Application Level of Hybrid Printing Technology
As one of the future development directions of China's printing industry, hybrid printing technology can further promote the performance and scope of digital printing. At present, the mixed printing technology of some developed countries has developed to a mature stage and has achieved good application results. However, China's research and application of hybrid printing technology started relatively late, the development of some key technologies is still not perfect, and there is no complete printing industry chain, which makes the mixed printing technology subject to greater restrictions in the promotion process. In addition, there is still a shortage of talents in mixed printing technology in China, which has made the optimization and development of printing technology more difficult. This requires the relevant middle and higher vocational colleges to actively increase the training of talents in this field. This will provide enough talent support for the printing industry.

5. Printing Technology Trends

5.1 Automated Development
With the continuous development of China's network technology, many new printing equipments also have certain automatic processing technology, and applied to a variety of automation technologies such as computer automatic control technology and shaftless technology. In the traditional printing mode, because printing paper has certain problems in the material, it also requires effective control of the humidity and temperature of the printing workshop during the printing process to avoid the influence of these environmental factors on the printing quality. In addition, the traditional printing mode requires a lot of manual operations, which leads to the influence of human factors in the printing process. Through the application of automation technology, it can timely analyze the temperature and humidity of the printing plant, and maintain the environment of the plant within a reasonable range through various measures such as air conditioner and dehumidifier, thereby ensuring the printing products and the quality. In addition, the application of automation technology allows the entire printing work to be carried out according to a preset procedure, which can reduce the labor loss in the traditional printing work, and on the other hand can effectively avoid the influence of human factors on the printing quality of the product. This has led to a significant increase in the economic and social benefits of the printing company.

5.2 Digital Development
Drupa 2016 is the world of digital printing equipment. From the exhibition, we can see that the application of digital technology in the printing field has gone far beyond the printing field. CTP has completely replaced the traditional prepress plate making; the digital printing machine has improved the energy level, no matter is it a rotation or a single sheet of paper, the printing format is increasing, the printing speed is improving, and the quality of printed products is progressing significantly; the digital printing is progressing significantly, the software makes the production process more intelligent, and the connection inspection is becoming the standard equipment. The docking of the Internet makes printing easier and faster, and customers can clearly understand the progress of the order.

The international authoritative survey organization Smithers Peel's research report "Digital Printing and the Future of Traditional Printing" released in 2016 shows that there has not been a big change in
the global printing volume in 2016, and the market share of traditional printing has dropped to 97.3%. It is expected that by 2020, this proportion will drop to 96.5%. In 2016, digital printing contributed 9% to the global printing market and is expected to reach 17.6% by 2020. Digital printing has been extremely popular for graphic printing and short-run commercial printing; it has also been accepted by publishers for short-run book printing; digital printing has been more widely used in labels and anti-counterfeiting printing. Personalized printing of wallpapers and tiles is not uncommon; now digital printing has begun to move forward to printing and dyeing, towards home decoration.

5.3 Green Development
With the continuous development of China's printing industry, digital printing technology has been widely used in many fields, and has achieved good application results. In this form, the domestic digital printing industry has also been widely developed, and the application field has become more extensive [5]. With the increasing awareness of environmental protection in the society, China has also introduced a series of environmental protection policies, and has begun to vigorously promote green printing and environmental printing. In the existing digital printing technology, it is bound to continue to develop in the direction of greening. It also needs to transform the current outdated printing structure and increase the market share of the digital printing market, thereby obtaining good results in economic benefits and ecological benefits. In recent years, the number of green printing enterprises in China has reached about 40%, which has also played a good role in promoting the construction of an environmentally-friendly society.

6. Conclusion
The advantage of digital printing is to meet individual needs, suitable for on-demand printing, variable printing and off-site printing, effectively reducing inventory and possible scrapping, in line with the stringent requirements of environmental protection for the printing industry, digital printing technology has broad application prospects. Therefore, China's printing enterprises also need to strengthen research on this aspect, explore the effective path of transformation of “traditional + digital” factories, and on this basis, continuously optimize and innovate the printing modes of printing technology to achieve “business complementarity” and “Production complementarity”, in order to promote the further development of China's printing industry.

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