Analysis on the Future Development and Existing Problems in the Application of Mechanical Engineering and Automation Technology in China

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Abstract. The rapid growth of science and technology has had a significant impact on all sectors. As part of the reform and development of various social sectors, the traditional manual labor mode has been supplanted by modern machinery and automation technology. It reflects the progress in science and technology of China as well as the development of social civilization. This paper describes the existing problems in the application of mechanical engineering and automation technology and its future development. In short, the current mechanical engineering and automation technology still have issues to be solved in environmental protection, independent innovation, market research, and specialized talents and education. In China, mechanical engineering and automation technology should be heading in the direction of intelligence, automation, user-friendliness, scientific modernization, and integration.

1 Introduction

In people's daily life and production, the development of electrification and automation technology brings a lot of technical support and provides convenience for people, and the technology has been widely used. Electrification has made a significant contribution to the improvement in the level of national industrial development and the quality of production to some extent. With the progress of time, electrical engineering and automation technology have become efficient, safe, and stable. However, to advance the development of China, it is a must to continue to enhance the technical competence in electrification and analyze the gaps in the current development situation. This paper explains the implications of mechanical engineering and automation technology, and then summarizes the existing problems encountered in the application of the technology. Finally, it describes the outlook for the development of mechanical engineering and automation technology. This paper can help supplement and enrich the relevant research in the field of mechanical engineering and automation technology.

2 Profound Implications of Mechanical Engineering and Automation

The rapid development of China's economy has greatly improved people's quality of life in the past few decades. As an integral part of the national manufacturing industry, the machinery manufacturing industry is increasingly challenged now [1], and there is still a gap between the domestic machinery manufacturing level and the international manufacturing level. Machinery manufacturing is closely correlated to the industry, which provides the main impetus for enhancing China's international status. At present, the application of automation technology to mechanical engineering has attracted the attention of most manufacturers and these manufacturers have realized how important the research of mechanical engineering and automation technology is to them [2].

The effective application of automation technology to mechanical engineering can improve the production efficiency of China's machinery manufacturing and give an impetus to raise the level of mechanical production in China. A majority of machinery manufacturing enterprises have started integrating the intelligent system with the mechanical engineering and automation system to significantly increase the production capacity of the manufacturing industry, laying a foundation for the development of China's economy.

3 Existing Problems in the Application of Mechanical Engineering and Automation Technology in China

3.1 Lack of environmental awareness

In terms of the design, production, and recovery of mechanical engineering and automation technology, China does not give enough attention to the concept of environmental protection and unduly focuses on economic results. What is more, the use of mechanical engineering and automation technology in industrial production and

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manufacturing vastly improves the productivity of industrial products, but it also has an impact on the environment. Industrial enterprises, especially some local industrial enterprises, only focus on the economic interests of factories and fail to emphasize the harmony of enterprise development with the environment, which has caused severe damage to the environment.

3.2 Lack of independent innovation

The machinery manufacturing industry is the mainstay of China's economy, so its rapid growth helps develop China's economy. In the process of development, the manufacturing industry in China has undergone a slow start. Meanwhile, its development depends on foreign countries while lacking communication with foreign counties. As a result, all of these seriously impede the development of mechanical technology. In a word, China's mechanical manufacturing technology lacks the capability of independent innovation and basic technologies and skills [3]. Currently, many innovations and basic technologies in the field of heavy machinery products are mainly the result of copying and transforming advanced technologies from foreign countries, which has a major impact on the innovative development of China's machinery industry. It hinders the development of manufacturing technologies and causes patent issues in the international community. A shortage of innovation consciousness is another issue existing in the application of mechanical engineering and automation technology. What mechanical engineering requires is an innovative idea of development, but now, most of China's mechanical manufacturing enterprises have an outdated pattern and lack innovation capacity [4]. An outdated idea of development is detrimental to the growth of mechanical manufacturing enterprises. At present, most of China's mechanical manufacturing enterprises fail to improve their mechanical equipment in the process of development, leading to the backwardness of their mechanical equipment and also affecting production efficiency to some extent. In addition, most of the technicians engaging in mechanical engineering in China have a relatively low level of expertise. Despite the abundance of theoretical knowledge, they lack practical experience and encounter some problems in the actual process of mechanical manufacturing, affecting the efficiency of mechanical manufacturing.

3.3 Lack of market research

Fundamentally, the demand for products has a significant impact on the process of research and development in the field of mechanical engineering and automation technology. A shortage of market research in the production process of the manufacturing industry is contradictory to the needs of people. Although the impact of products is desirable, products cannot be sold, which might cause huge losses to enterprises. Furthermore, advanced technologies are blindly introduced from foreign countries and productive applications are applied. Moreover, what makes it worse is that these technologies and applications fail to quickly adapt to the market changes in the production of some machines in China, thus impeding the long-term development of enterprises. In foreign countries, a large number of advanced enterprises using CNC (Computer Numerical Control) machine tool technologies have applied new precision machining techniques in their machining technology, which plays an important role in accelerating the development of enterprises. Due to the blind introduction of these technologies, the dependence of China's enterprises on research and development is reduced, causing the underutilization of these technologies.

3.4 Lack of talent and professional skill education

The talent shortage is another issue existing in the application of mechanical engineering and automation technology. Specialized persons are required to be involved in the development of mechanical engineering and automation technology, but the current development of China's mechanical engineering and automation technology is affected by a shortage of talent to some extent. A shortage of specialized talent results in problems in the actual application of mechanical engineering and automation technology and further causes accidents [5]. The development of China's mechanical engineering and automation technology has a relatively slow start, so the time for development is very limited. In this case, there are very few technicians engaging in mechanical engineering and automation technology, and a shortage of professionals is a key factor restraining the development of China's mechanical engineering and automation technology. In the development of China's machinery manufacturing industry, one of the major problems is that the training of professionals is unavailable, and currently, most of the machinery manufacturing enterprises in China overly focus on the development of automation technology and neglect training for professional skills. In fact, a shortage of talent is a key factor influencing the development of China's mechanical engineering and automation technology.

4 Development Potential of Mechanical Engineering and Automation Technology in China

4.1 Micro energy efficiency

Mechanical engineering and automation technology are still in their infancy, and it is expected that the existing automation technology is gradually developing in the direction of energy-saving miniaturization. The existing automated machinery consumes a lot of resources and brings many problems to the implementation of automation technology, so the research and development shall be scaled down in the future to improve energy efficiency. In recent years, both China and the international community are paying more attention to the issues of environmental protection and energy efficiency.

There has been a trend for China and the international community to develop automation to realize energy efficiency, so more investment will be needed in mechanical engineering and research in miniaturization and energy efficiency.

4.2 Integration of multiple technologies

Currently, great progress has been made in mechanical engineering and automation technology, which is a result of combining technology with remarkable achievements, such as intelligent and flexible technologies [6]. Incorporating multiple technologies into the future development process of mechanization remains an integral part of technological advances and improvements. The integration of electric automatization, the combination of sound and light control technologies, and the combination of new QR codes are always a combination of existing technologies to give the world a new look. Traditional office equipment and technologies can be combined with utility models, thus introducing new products to suit the needs of people and improving the development of automation. For instance, China's manned submersible and deep-sea exploration technologies are a combination of technologies and now have reached the world-leading level [7].

4.3 Management innovation and Improvement in technical precision

In China, mechanical engineering and automation technology are still in the stage of development, and the degree of industrial development is closely linked to mechanical automation. It can be seen from the analysis of relevant data that the following two problems are confronting the current development of China's mechanical engineering and automation: insufficient momentum to development and insufficient technical precision. To solve these two problems, future development of mechanical engineering and automation technology can also be analyzed from the following two perspectives:

Firstly, the main cause of insufficient momentum to development is a shortage of innovation in production and management. If China's mechanized production enterprises desire to change the pattern of insufficient impetus to industrial production, they should timely innovate management ideas and management modes. Combined with the actual production of machinery manufacturing at present, the problems are analyzed and the corresponding measures for improvement are proposed.

Secondly, the precision of automated production processes and technologies is not sufficient. Insufficient precision is one of the important reasons for the failure of the quality of products to meet the specified standards. The ultimate purpose of products is to be put on the market and raise user satisfaction, thus obtaining economic benefits. However, insufficient precision causes the failure of produced products to gain user satisfaction and cannot provide an economic foundation for the growth of the manufacturing industry. The advent of the age of supply-side structural reform makes people pay more attention to the precision of products. In this case, extensive production is becoming difficult to suit the needs of social development, so an increase in the precision of mechanical engineering and automation technology plays an important role in industrial production at present.

The scientific and technological levels of China influence the development orientation of mechanical engineering and automation technology to some degree [6]. Some problems are confronting China's mechanical engineering and automation technology during the application, and how to solve these problems is the main focus of attention of the personnel involved in machinery manufacturing. In China, machinery manufacturing enterprises should innovate automation technology, optimize the technical scheme of mechanical engineering and automation technology on the premise that the efficiency of machinery production is guaranteed, and integrate intelligent technology with automation technology to give impetus to the long-term development of China's mechanical engineering and automation technology. In short, China's mechanical engineering and automation technology should be heading in the direction of intelligence, automation, user-friendliness, scientific modernization, and integration [8].

5 Conclusion

To sum up, the era of science and technology is also an age of developing automation and intelligence. It is one of the reasons for the steady growth of China's economy. The machinery industry must fully adapt to the characteristics of the present age, strengthen its technical capacity, promote the development of automation, change the development pattern of the traditional hand tool industry, and innovate new ideas. From the overview and outlook of mechanical engineering and automation technology in this paper, it can be seen that the problems confronting mechanical engineering and automation technology include a lack of environmental awareness, insufficient innovation consciousness, little comparison with the actual situation, and a shortage of talent. To solve the above-mentioned problems, mechanical engineering and automation technology can focus on the improvement of micro energy efficiency, multi-technology integration, innovative management, and technical precision in the future.

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