

Problems and countermeasures in mechanical automation design and manufacturing

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Abstract: In view of the problems existing in the development process of mechanical automation design and manufacture, this paper analyzes the limitations of design and manufacture in the market environment of mechanical automation from the practical point of view, and puts forward some countermeasures. The results show that the combination with the actual development needs of the industry, the introduction of foreign advanced technology "localization" and the improvement of personnel quality level are several effective measures to improve the current development of the industry.

1. Introduction

The promotion of industrialization construction level needs the support of mechanical automation design and manufacture. However, in the process of application of design and manufacturing automation, the unbalanced development and backward automation equipment have led to some production and construction enterprises still use manpower to complete the operation. This hinders the healthy and stable development of the design industry. In order to further realize the goal of all-round development of modern economic construction, researchers should analyze the causes of the problems in the application of mechanical automation design and manufacturing technology so as to grasp the measures available for control. Then realizes the industrial modernization construction anti.

2. The practical significance of studying the existing problems and countermeasures in the design and manufacture of mechanical automation

As a complex technology, mechanical automation design and manufacturing technology, as the name suggests, is a combination of a variety of application-oriented technology with a variety of characteristics of application-oriented technology. At present, the industrial production is in the rapid development stage, and the application level of mechanical automation design and manufacturing technology needs to be higher and higher. In some fields, the level of mechanical automation design and manufacturing technology can't keep up with the actual development and construction needs, which hinders the healthy and stable development of the whole industry. In order to make industrial production move steadily towards the all-round development, the builders in the industry should analyze the problems of mechanical automation design and manufacture. In

order to find out the future design and manufacturing technology application and construction direction, and then meet the industry development needs.^[1]

3. Problems in mechanical automation design and manufacturing

Through the analysis of the practical application of mechanical automation design and manufacture technology, it is found that although the technology is developing rapidly, it is still in the operation stage of automation, and there is much room for improvement with the anticipated automation. Specifically, there are many limitations in the industrial-level construction of mechanical automation design and manufacturing engineering, which mainly focus on two aspects: On the one hand, the development of mechanical manufacturing is not balanced enough and there is a lack of enterprises with independent research and development of mechanical automation technology. Under these conditions, a large number of enterprises and equipment manufacturers of automation backward, more rely on manual operation. On the other hand, the automatic equipment used by machinery manufacturing enterprises and manufacturers lags behind the equipment operation level in developed countries. For example, the diversity of equipment and processing accuracy is far lower than the level of machinery manufacturing in developed countries.^[2]

For mechanical automation technology, due to the characteristics of research and development, its technological upgrading is a slow and long-term process. As long as the builders concerned improve the above problems as the direction and focus of industry technology development, it will quickly and western developed countries with the level of mechanical automation design and manufacturing technology, and even beyond. Therefore, researchers should formulate specific mechanical automation design and manufacturing technology research and promotion measures to use strategies to effectively promote the development of the industry.

4. Countermeasures in mechanical automation design and manufacturing

4.1 Develop core industries in an all-round way

As one of the important signs of China's industrial strength, the machinery manufacturing industry is not only the foundation of the national economic construction, but also the power source of deepening the modernization of all walks of life.^[3] In the application of mechanical automation design and manufacturing to solve the problem, it is necessary to take the production equipment of the original mechanical enterprise as the basis, and gradually add automation equipment, so as to make the full use of the value of the operation of automation equipment. In other words, the automation of the machine-building industry as the main line, and the use of equipment control to achieve the automation of production lines. While making efforts to develop the industrial core, we should also integrate the sustainable use of energy and environmental protection into the overall development process in order to avoid the defective construction path of "development first, then governance" in developed countries. In this way, the cost of mechanical design and manufacture can be effectively controlled. In order to practice the sustainable way of development and construction, it is necessary to increase scientific innovation and develop environment-friendly production equipment in the process of machinery manufacturing design. It is worth noting that the research and development of mechanical automation design and manufacturing technology should be directed towards the direction of independent innovation -- combining with foreign advanced technology and improving the effectiveness of technological level through localization construction.

4.2 Realize the modernization of automation technology

The automation of mechanical design and manufacture is a process from simple to easy, from manual operation to operation automation.^[4] Therefore, the construction of machinery automation is the key to promote the development level of human society, enhance production efficiency and save labor. In order to improve the current situation of machinery automation design and manufacturing enterprises, such as backward equipment, low level of automation and manual operation, relevant builders should speed up the realization of modern technology. Starting from the work of science education, through continuous innovation, efforts to achieve industry development expectations. The scientific research and education personnel should add the training contents of advanced mechanical manufacturing technology in foreign countries, so that the level of automation in mechanical processing, the level of automation in digital processing and the level of automation in computer control can meet the needs of industry construction.

4.3 Develop “localization” of automation design

At present, there is a big gap between China and foreign countries because of the backward technical level of mechanical automation design. Therefore, in order to make digital control automation and computer control automation, we need to carry out "localization" transformation of advanced technology from a practical point of view to realize the modernization construction needs of China's machinery industry. Taking the most commonly used computer integrated design system for mechanical automation design as an example, its application control features include: low technical requirements, low cost, easy to form a production process, simple operation and to meet the needs of large-scale mechanical products. In order to improve the level of automation in mechanical design, we should start with the analysis of the process of machining and production, from the types of equipment such as semi-automatic machine tools, automatic machine tools and modular machine tools concentrate on mass production the rigid automation. In addition, the combination of machine tools and composite machine tools to meet the batch production of mechanical processing equipment used to run control needs. For digital machine tools and machining centers, small batches or single piece of mode of production should be adopted to achieve the goal of "localization" of mechanical automation design.^[5]

4.4 Concurrent development of automatic design to improve professional quality of personnel

First of all, the personnel of mechanical automation design and manufacture should combine the theory and practice under the condition of good preparation, in order to realize the parallel development goal of the main engine and the auxiliary automation components. Secondly, due to the development of theoretical control, the single mechanical technology can't meet the requirements of system operation. Therefore, designers should incorporate the physical characteristics of system structure, part quality, part stiffness and volume into the design of mechanical equipment products. The concrete concurrent development designer, must take the programmable controller, the computer control system, the sensor technology, the new cutting tool as well as the system simulation software and so on, as the mechanical automation design and the manufacture level promotion Foundation, in order to achieve the industry automation development anticipated. Finally, in terms of personnel, the builders of mechanical automation design and Development should organize training and study new theories and concepts related to the discipline so as to enable them to implement the process of upgrading the level of automation design and manufacturing technology modernization. In addition, it should be transferred to the workers involved in the machinery manufacturing industry, so that they can improve and advance the

existing products according to the actual situation, and then form an industry chain with the advantage of virtuous circle. To improve the professional quality of personnel, we should learn new knowledge, new theory and new operating method in the market environment, so that it can be applied to the actual mechanical automation design work.^[6]

5. Conclusion

To sum up, the effect of mechanical automation design and manufacture should start from the angle of market environment. That is, on the basis of clarifying the present situation of development and construction needs and problems, we should develop the core industry in an all-round way, practice the modernization of automation, and develop the "localization" of automatic design and develop automatic design in parallel. By improving the professional quality of personnel to ensure that equipment backward, market demand and uneven development and other issues will not bring too much impact on the development of the industry. Therefore, the builders in the industry should apply the above analysis and research results more to the mechanical automation design and manufacture engineering with different construction requirements and development directions, so as to achieve the work expectation.

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