Research on Application of Electronic Technology in Intelligent Manufacturing

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Abstract: Science and technology are making continuous progress, and electronic technology is also developing rapidly, and its application scope is getting wider and wider. In the current production process of industrial enterprises, intelligent manufacturing has become the mainstream of the manufacturing industry. Intelligent manufacturing simulates the human brain through computers to analyze, reason, judge and make production decisions in every link of the manufacturing process. Computer simulation of human brain has become the most simple way in the current production process. Through computer control, precise control of mechanical production process has been realized. Electronic technology has a very important influence on the main structure of mechanical engineering technology, product structure, product function, management system and production method. This paper discusses and understands the specific application of electronic technology in intelligent manufacturing from four aspects: sensing technology, industrial robot, numerical control processing technology and three-dimensional computer simulation technology.

1. Introduction

With the continuous improvement of science and technology, China has gradually entered the era of intelligent manufacturing. Intelligent manufacturing requires effective integration and penetration among various disciplines, which also accelerates the reform and development of engineering in our country. Electronic technology successfully combines electronics and machinery, realizing the informatization and intelligent management of mechanical equipment, and making people realize that the development of science and technology has brought good benefits [1]. Therefore, the intelligent management of mechanical equipment has been realized. The manufacturing in the new century must be intelligent manufacturing. Intelligent manufacturing system is to turn human intelligence activities into intelligent activities for manufacturing machines. With the artificial intelligence technology, intelligent manufacturing has added the functions of decision-making, information processing, simulation and automatic detection, which really realizes the intelligent control of manufacturing process [2]. No matter how the electronic technology develops and progresses, its service targets are all human beings, so it is necessary to ensure that the humanization of electronic technology can be maintained. In the new era of the development of modern society, it is of great significance for the development of intelligent manufacturing industry to strengthen the exploration of the application of electronic technology in intelligent manufacturing.

2. The Meaning and Development of Intelligent Manufacturing Technology

Intelligent manufacturing mainly consists of two parts: intelligent manufacturing technology and intelligent manufacturing system. Intelligent manufacturing technology is called IMT for short, which is based on computer simulation system to carry out analysis, research and decision making [3]. Through the cooperation between human and intelligent machines, it will expand, extend and partially replace the mental work of human experts in the manufacturing process. IM applies advanced technologies such as neural network technology and fuzzy control technology to the manufacturing industry to make the manufacturing process intelligent. Intelligent manufacturing technology is the mainstream of current mechanical manufacturing technology. Intelligent manufacturing technology enables mechanical equipment to drive and control components of

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mechanical equipment autonomously, thus realizing intelligent control of mechanical equipment system. The current intelligent manufacturing technology is more and more advanced, especially the development of three-dimensional dynamic simulation technology. Computer programming technology has also begun to evolve to multi-dimensional view direction, just like on the drawing on the computer [4]. At the same time, with the wide application of intelligent robots, valuable data information can be automatically identified and acquired, thus completing complicated work flow in a short time. Intelligent manufacturing technology can carry out reasonable and effective control in product design and multiple links of production, which to a great extent reduces the labor force, which reduces the labor force with high cost for enterprises. This has reduced the labor force to a great extent. For enterprises, it has reduced the labor force with high cost and improved the survival and development of enterprises [5].

Nowadays, the intelligent manufacturing technology has been developing towards the direction of science and technology and information. Intelligent manufacturing technology stores a large amount of information. Intelligent manufacturing can store a large amount of information, can effectively obtain the information in the production process, and can deal with the problems in the production process in a timely manner. Intelligent manufacturing system is a man-machine integrated intelligent system, which adopts a technology line of taking people as the center and integrating people and machines. The two are on equal footing and form a system to perform their own good work. For example, in the production process of a certain product, entering a link that requires the use of a drill bit, when the use time of the drill bit is not reasonably controlled, a long time will lead to a smaller aperture of the product, and the problem will be reflected in the detection system before entering the next process. When applied to the construction of sensor network system in intelligent manufacturing, the information in each system in intelligent manufacturing can be connected together, at the same time, information transmission can be realized, and the intelligent manufacturing effect is more effective.

3. Characteristics of Electronic Technology

3.1. Intelligence

With the continuous development of science and technology, the traditional production mode of mechanical manufacturing has become obsolete. Due to the continuous development of science and technology, mechanical manufacturing technology has also injected new vitality and integrated the functions of various technologies. These intelligent science and technology have been widely used in various fields [6]. The electronic technology in the future will develop towards more intelligence, modularization and networking. The combination with computer can realize the integration and analysis of information to realize the intelligent control of production process and reduce the occurrence of error rate in production. In the development of intelligent manufacturing industry, intelligent manufacturing technology can be regarded as the premise and foundation of intelligent manufacturing system, and intelligent manufacturing system can be regarded as the extension and future of intelligent manufacturing technology.

3.2. Full control

As one of the most prominent features of electronic technology, full control replaces the traditional electronic technology to some extent, especially in some electronic devices with self-turn-off function. In order to reduce the number of connecting wires, bus technology is used instead of some connecting wires. For example, if networking is adopted, the layout of connecting wires will be simplified. In some special industries, micro-intelligent manufacturing has obvious advantages in product production, especially for those devices with small volume, low energy consumption and flexible height setting, which can easily achieve the goal that ordinary people cannot achieve. Intelligent manufacturing system is a very complex large-scale system. It is a multi-factor, high-order and non-linear system. Traditional modeling methods are very difficult. It is used to coordinate the intelligent manufacturing design to reduce the design difficulty and standard, so as

to effectively improve the efficiency of intelligent manufacturing, thus saving the cost of intelligent manufacturing [7]. The replacement of human brain by computer can greatly improve the work efficiency and reduce the burden of people in the whole process. Therefore, it has received great attention from mechanical and electrical workers.

3.3. Network

At present, the most advanced mechanical manufacturing technology is to use computer-aided technology and intelligent control technology together, gradually moving towards the direction of intelligent machinery. The application of intelligent robot technology can effectively improve the production efficiency and product quality, and plays an extremely important role in the innovation and reform of products and the improvement of working conditions. Applying flexible electronics technology to intelligent manufacturing can better conform to the production of multiple batches of products, and can automatically scientifically adjust the production plan according to market demand [8]. The basic idea is to start from the essential characteristics of intelligent manufacturing system, in the distributed manufacturing network environment, according to the basic idea of distributed integration. Although numerical control machine tools cannot run as intelligently as human behavior or thinking, they have some human intelligence performance, which greatly promotes the performance improvement of intelligent manufacturing products.

4. Application of Electronic Technology in Intelligent Manufacturing

4.1. Sensing technology

With the continuous development of science and technology, the traditional production mode of mechanical manufacturing has become obsolete. Due to the continuous development of science and technology, mechanical manufacturing technology has also injected new vitality. The ultimate purpose of the application of intelligent manufacturing technology in the process of mechanical manufacturing is to use advanced computer technology instead of manpower to carry out production and labor, mainly to simulate the production mode of human beings to carry out mechanical manufacturing. Sensing technology can make use of the advantages of information technology to a great extent to ensure the sensitivity of the whole manufacturing process and avoid unexpected information from interfering with the manufacturing process. In order to meet the production needs of diversified industrial enterprises, the organic combination of the two technologies also provides a broader development space for the development of the two. The maturity of sensing technology is the key to the smooth realization of high-efficiency automatic production mode. At present, photoelectric sensing technology is the most effective and widely used technology, which combines electrical and optical principles and can simultaneously detect and record multiple factors that cause light quantity changes [9]. The application of model data fitting and information processing can simulate and process the data and information in intelligent manufacturing to ensure the accuracy and efficiency of intelligent manufacturing. It plays an important role in machinery production. The realization of intelligent manufacturing has injected new strength into the whole machinery industry.

4.2. Industrial robot

In the new era of social development, intelligent manufacturing technologies are developing in a variety of ways. Among them, industrial intelligent robots have advanced characteristics and are a new type of results composed of a variety of advanced technologies such as artificial intelligence technology, bionics, computer system technology, etc. In intelligent manufacturing, this is the most advanced application embodiment of electronic technology. Besides, there are high-performance servo motors, high-precision speed reducers and controllers. Through the analysis and processing of the information collected by the computer, the control of the whole production process is finally achieved. Through artificial intelligence, remote sensing technology and communication technology, various disciplines are mixed together, such as bionics, mechanics, art and so on. Through the

processing of these information, mechanical manufacturing plays an important role. In this way, an intelligent information database can be built in the numerical control technology, and intelligent monitoring and programming can also be realized. However, automated production is mainly through computer networking, which effectively combines automated warehouses, computers and numerical control machine tools to realize networked and dynamic production. It can be used in combination with computer technology and functional software technology to form a three-dimensional simulation dynamic picture, which makes the production process and information more clear and improves the accuracy, effectiveness and safety of intelligent manufacturing.

4.3. Numerical control machining technology

One of the earliest applied and intelligent manufacturing technologies is numerical control processing technology. The level of mechanical manufacturing and industrial production are affected to some extent. It is applied to intelligent manufacturing management and control, because NC production technology also includes information processing technology, data simulation technology, induction technology, etc. It can analyze abnormal data in intelligent manufacturing to find out manufacturing problems and process them so that intelligent manufacturing can continue to operate normally. The application of electronic technology in intelligent manufacturing is convenient to strengthen the control of mechanical manufacturing precision and improve the mechanical production efficiency, and has good application value. The application of electronic technology in numerical control machine tools is coordinated by CPU and main line mode. Through scientific control and configuration of flexible manufacturing system, compared with traditional single machine operation, the output is greatly improved. It not only involves the relevant simulation information covered in the system, analyzes and processes the information data, but also plays a positive role in promoting the control and management in the production process. The intelligent system can scientifically and accurately analyze some complicated calculations and structural calculations in the field of numerical control, and make inferences according to relevant principles. In this way, an intelligent information database can be built in the numerical control technology, and intelligent monitoring and programming can also be realized.

4.4. Three-dimensional computer simulation technology

With the improvement and development of science and technology, many intelligent, information and data technologies have been developed and applied in various fields, especially in the industrial field. Automation machinery mainly controls the production process through electronic technologies such as man-machine interface control equipment. It has a wide range of applications, such as beverage automatic production line, printing and packaging production line, etc. Before manufacturing, the appearance and structure of the processed objects are designed through the three-dimensional simulation technology, and the quality of the whole manufactured object can be seen through the three-dimensional view. It is a technical type of computer networking, which mainly integrates the elements of automated warehouse, computer, numerical control machine tool and so on into a whole. It is necessary to simulate the production mode of human beings to make machinery. Intelligent control technology can simulate the state of mechanical manufacturing through fuzzy calculation method of network. Use professional technology to process and proofread data and prepare inspection reports, which can only be approved after being approved. Intelligent manufacturing has become the mainstream of mechanical manufacturing. Intelligent manufacturing technology has been able to realize autonomous driving of machinery and intelligent automatic control of machinery.

5. Conclusion

Electronic technology plays an increasingly important role in intelligent manufacturing, which greatly improves the previous production efficiency and has been widely used. Innovating the traditional production mode, the wide application of electronic technology in intelligent manufacturing is the result of economic development and is also the need of industrial production.

It has raised the level of intelligence in manufacturing, improved social productivity and promoted all-round development of social economy, which will have a beneficial impact on China's future economy, politics and culture. For enterprise development, it not only reduces enterprise consumption, but also improves product production efficiency and quality. Therefore, actively exploring the application of electronic technology in intelligent manufacturing is of great significance to the intelligent manufacturing of enterprises. Therefore, it is necessary to strengthen the development of mechatronics and the application of intelligent technology in manufacturing so as to promote the improvement of production in the enterprise intelligent manufacturing industry.

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