Application of Computer Information Processing Technology in Industrial Automation

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Abstract: With the continuous progress and development of China's socialist market economy in recent years, the competition in various industries has become increasingly fierce, and all kinds of enterprises are constantly improving their comprehensive competitiveness. Only in this way can we ensure a firm foothold in the market, especially in the field of industrial production, and the higher production efficiency and intensity brought about by technological innovation and progress. The introduction of computer technology has strengthened the competition in the industrial field, and has also provided a strong impetus for the progress of industrial production. Computer technology is also the core of automation technology, so strengthening the research of computer information processing technology in industrial automation is to provide better guarantee for industrial production. This paper mainly analyzes and discusses the computer information processing technology used in industrialization at present, in order to provide reference and help for the development of related industries.

Since the beginning of China's reform and opening up, the national economy has shown a rapid upward trend, and the development of the industrial field is also making progress. One of the most important reasons is the demographic dividend, which has enabled our economy to develop rapidly. However, with the decrease of the demographic dividend effect in recent years and the transformation of our market economy, the pace of economic development has gradually slowed down, which has led to a gradual increase in the cost of labor now, many traditional industrial projects no longer have advantages, and enterprise benefits are decreasing. This background has brought opportunities and space for the introduction and development of computer technology. With the continuous breakthrough of network technology and the continuous improvement of network coverage, the introduction of computer technology into the field of industrial production will inevitably lead to a huge increase in production efficiency and industrial efficiency.[1].

1. Industrial automation technology

With the rapid progress and development of the times, the industrialization process of our country is also developing towards the direction of automation. In the field of industrial production, automation technology has become the symbol of productivity and production benefit, which is of great significance to the promotion and guarantee of industrial benefit. Is to ensure the reduction of the entire production process may occur all kinds of errors and improve the entire production process production efficiency and enterprise efficiency. In addition, in the whole field of industrial production, there are various kinds of commodities and different enterprises have different requirements for different products. Therefore, enterprises should choose the most suitable computer information processing technology according to the characteristics of their own products and various technical requirements when choosing computer information processing technology, so as to realize the...
automatic control of enterprise production process and enhance the comprehensive strength of enterprises\cite{2}.

2. Importance of computer information processing technology in the application of industrial automation production

In the process of industrial production, computer information processing technology, because of its own characteristics of simple operation and convenience, can make production enterprises have the advantages of improving production efficiency, product quality, enterprise benefit and so on, which can be greatly improved compared with traditional manual production. At the same time, the application of computer information processing technology has improved the automation level of production, and will also have better guarantee in the stability and safety of production process, enhance the comprehensive competitiveness of enterprises, bring better economic benefits to enterprises, and provide a better foundation for the development and progress of enterprises. At present, with the continuous improvement and rapid development of social informatization in China, computer information processing technology is also becoming more and more mature in the continuous development, and has been widely used in all aspects of the production field. For the automation of industrial production, the application of computer information processing technology has epoch-making significance. In the current market competition, the acquisition and analysis of information is of great significance to the development of enterprises, and the ability of computer information processing is far better than that of manual. Therefore, the development and application of computer information processing technology in market competition can create a good competitive environment for enterprises and enhance their competitive strength. Besides, with the continuous technological breakthrough and progress of sensing technology in China in recent years, combining it with computer technology and Internet technology organically, it can produce a new technology ---- network intelligent sensing technology which has a great effect on industrial development. This technology can effectively improve the speed of information transmission, can better output all kinds of problems in the process of industrial production, and can also deal with all kinds of feedback messages for the outside world in a timely manner, which can effectively guarantee the stability and security of production and ensure the effective solution of production problems to the maximum extent\cite{3}. As shown in Figure 1 below:

![Figure 1: Working diagram of network intelligent sensing technology](image-url)
3. Development of Computer Information Processing Technology in Industrial Production

The development of computer technology in China has experienced a long time and complex process, which can be divided into the following four stages according to the characteristics: first, the pioneering period, the computer in this period can be simply regarded as a simple advanced calculator, only through the computer to carry out some complex operation process, there is no practical application in the industrial field; second, the digital control period, in this stage can be carried out by computer to control and debug some simple industrial production process; Third, in the era of minicomputers, the applications of computers are mainly to produce some small computer models, such as desktop computers and laptops. These computers also mainly play some civil roles: fourth, in the era of minicomputers, with the rapid development of modern chip technology and the deepening of research progress of electronic components, chips begin to develop towards integration, and computer development has entered a new era. In the current information age, the development of computer processing technology has been enriched and expanded, the main development direction is the standardization of computer information processing technology, the network of computer control and the intelligence of computer control. Standardization mainly refers to the application of computer in various fields, which should be combined with the development characteristics of each field to formulate and optimize and upgrade computer information processing standards, so that computer information processing technology in the actual production process can better achieve the collection and processing of all kinds of production information, but also more stable and safe control of industrial production. Network mainly means that in the actual industrial production process, operators can carry out remote information processing and control of the production process through the network, which can greatly expand the scope of application of computers in the industrial field. For some environments which are not conducive to human operation, the application of computer technology can improve the stability and safety of production and greatly improve the management efficiency of industrial production. Intelligent is the application of computer information processing technology to the automatic control system, can monitor the production process 24 hours a day, once there are some problems in the production process, the system can timely identify and carry out effective transmission of information, timely transmission of emergency information through the network to duty or management personnel, so that they can send relevant technical personnel to solve the problem in time, to ensure the normal production and production stability and safety\textsuperscript{[4]}. 

4. Application of Computer Information Processing Technology in Industrial Automation Control

The computer information processing technology mainly combines the modern computer processing technology with the industrial automation control technology organically, and the advantages complement each other, forming a kind of control and control technology for the industrial production field. Computer control mainly refers to the pre-setting and control of each step in the industrial production process through programming language in industrial production, so as to ensure that all kinds of data in the production process can be collected and effectively processed in time, and improve the production efficiency and the comprehensive benefit of the enterprise.

4.1. Digital information processing technology

In the automation production of modern industrial production, digital information processing system belongs to a common system, which is mainly by pre-programming the whole industrial production process, so that the enterprise production personnel can monitor the production process in real time through wireless network, collect all kinds of production process parameters, process information and so on, and then realize automatic control. In the process of industrial production, the digital information processing technology needs the support of all kinds of hardware of the corresponding computer equipment. Through the hardware of the computer equipment, the pre-set work target can be transmitted to the parameter setting system of the production equipment in digital form. After receiving the digital signal, the production equipment can automatically carry out a series of
production operations according to the programming language. In the whole system, software technology is the core part, which plays a decisive role in the normal operation of the equipment. In order to maintain production smoothly and correctly, it is necessary to optimize the efficiency of computer technology in the development and upgrading of software and hardware systems. In addition, the digital information processing system can realize the monitoring of all kinds of equipment in the whole production process, and the work and management personnel can monitor whether the system is in normal operation state through the network, and carry out all kinds of inspection work, so as to ensure that the fault information can be solved and processed in time.

4.2. Distributed control systems
Distributed control system is also a common and frequently used system in modern industrial production automation control system. Using the distributed control system to control industrial production, the running computer can collect the data of various parameters in industrial production according to the preset programming, combine with the actual data parameters, and then analyze a series of data in controlling industrial production. Throughout the research and development process of computer information processing technology, one of the important milestones is the successful development of distributed control technology. After the application of distributed control system in industrial production, production and manufacturing are more reliable and stable. Computer distributed control system, mainly through the analysis and collation of industrial production automation control data parameters and other information, and combined with the calculation formula, computer managers feedback information and other data. Compared with other control systems, the central computer only needs to transfer data to other devices to process, and does not undertake the task of data processing, which makes the automatic control system more stable to some extent.

4.3. Fieldbus
In general, fieldbus is an automatic control system based on control system and digital communication technology. For the current industrial automation control system, the field bus has been widely used in industrial production, which has played a strong role in promoting the development of industrial automation control. Fieldbus has a special operation processing system, in the application process, so that the controller and the operation processor can be combined to maximize data communication, and in addition, in the modern industrial production process, usually twisted-pair wire as the transmission medium, through the computer network to achieve the controller and calculator connection. In addition, in the process of industrial automation production, fieldbus can promote the efficient transmission of information data, and because of the special operation processing system, it also has its own unique advantages in analyzing and processing data and information. From the point of view of the present situation, compared with other control technologies, bus technology not only has stronger data processing efficiency, but also the operation process is more simple and convenient. is the key technology to become the future development of industrial automation.

5. Conclusion
To sum up, computer has a wide application prospect and practical effect in current industrial production. Through the promotion and optimization of computer information processing technology, the core competitive ability of enterprises in China's industrial field can be further improved. It also has good practical effect for ensuring the normal operation of production and real-time monitoring, which is worth studying by relevant enterprises and departments.

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