Application Analysis of Automation Technology in Mechanical Manufacturing

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Abstract: With the development of China's economy and the advancement of science and technology, machinery manufacturing-related industries are becoming increasingly prosperous. At the same time, all sectors of society have put forward higher requirements for production technology and product quality, and traditional machinery manufacturing technology and machining technology can no longer meet The actual needs of modern society, therefore, mechanical processing and manufacturing should combine its own characteristics, continue to carry out technological innovation, introduce high-tech methods, enhance its comprehensive competitiveness, improve product quality, realize intelligent and automated production processes, and better serve the economy. Construction services.

1. Introduction:

Under the influence of contemporary society and economy, technology promotes development and technology promotes economy has gradually become the focus of attention of all walks of life, especially in recent years, the rapid development of Internet and computer technology. The use of information technology and automation technology to realize the transformation of the original domestic traditional industries will become the key to the improvement of productivity in these industries. As a company that focuses on the design and manufacture of mechanical equipment, it should also conform to the background of the times and the needs of consumers, and implant new technologies, including old, traditional and other types of mechanical equipment. This will make the use of these mechanical devices easier, more convenient, more efficient, and more labor-intensive. Therefore, combined with the above-mentioned background, it has become necessary and critical to continuously strengthen the research of automation technology in contemporary mechanical design and manufacturing, which will have an important impact on the future prospects of the industry.

2. The benefits of automation technology

Machine automation improves the quality, accuracy, and repeatability of products. It provides fewer human errors. When the machine is programmed to perform repetitive tasks, machine automation provides higher throughput, and automated equipment can produce more Most manpower is more productive, and it will increase profitability. Automation will speed up production time. People are prone to making mistakes. Machines that perform repetitive tasks are less likely to make mistakes than employees. When automated machines are programmed to perform tasks repeatedly, the accuracy is much higher than that of employees. Machine automation provides less staff costs and fewer human resources. When an automated machine is added to the operation, therefore, fewer staff are required to complete the work, it will lead to fewer safety issues, thereby saving finances and reducing or reduce a lot of costs, such as wages, medical care, benefits, and sick leave. Automation reduces the number of employees performing dangerous and vulnerable tasks. Therefore, it improves safety and the working environment will be safer. Automation reduces the impact of labor shortages in skilled industries. This is a particularly powerful project. Automation eliminates unconscious tasks. A valuable argument is that automation only eliminates unconscious, manual, and clerical daily boring tasks, and ultimately improves the overall level of working conditions. Machine automation improves the safety of workers. If the labor is transferred

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from active and hands-on positions to management positions, overall safety is improved. This is a major selling point of automation. The benefits of automation include saving labor and saving electricity costs. And material costs, and improve quality, accuracy and precision [1].

3. Automation concept and application significance

Automation technology is a modern technology that integrates a variety of modern science and technology. It can effectively realize the continuous and automated production of machinery manufacturing, engineering and other industries. At the same time, automation technology can optimize the production system, effectively manage the production system, and enable manpower It is liberated from many manufacturing processes, which has an irreplaceable effect on improving the engineering transformation and flow of mechanical processing and manufacturing.

Mechanical automation technology combines a variety of modern high and new technologies and has considerable engineering advantages. According to its practical application in the mechanical manufacturing industry, it is mainly reflected in the following aspects: First, mechanical automation can effectively perform production operations in accordance with these procedures, greatly improve the quality of products, shorten the production cycle of products, and improve production efficiency. Second, mechanical automation has made outstanding contributions to liberating productivity, changing the working environment of workers, greatly reducing the labor intensity of workers, and reducing the dependence of the mechanical processing industry on manpower. Third, it reduces production costs. Mechanical automation can ensure productivity, reduce the probability of producing bad products, and achieve low production costs and high production quality. Fourth, the application of mechanical automation production lines provides a broad space for the innovation and development of enterprise manufacturing processes. It is conducive to the improvement of the entire production process, is conducive to the timely introduction of advanced manufacturing technology, and injects new power into the mechanical automation production system. In summary, automation technology has great application significance in the field of mechanical processing and manufacturing, and is worthy of innovation and development.

4. Application analysis of automation technology in mechanical design and manufacturing

Integrated application: With the rapid development of the Internet and computer technology, mobile communication terminals are becoming household names, and the demand for these electronic mechanical devices in people’s lives and work has rapidly increased, making it more convenient for people to use these products in their lives and work, and integrate Play an important role in meeting this demand. For new electronic products, it has become impossible to use more traditional manual production technology. The use of automation technology in the production process of electromechanical equipment will meet the needs of integration. Use the characteristics of automation technology to improve operation accuracy and improve production quality. It can achieve more precise production management of precision components, so that the final product has a higher technical content, and meets the needs of the modern public [2].

Intelligent application: Automation technology occupies an important position in intelligent production. Through the use of more scientific testing instruments, monitoring equipment and monitoring methods, automation technology can realize area detection and area monitoring that cannot be achieved manually. For example, for the excavation of underground roadways, it is difficult for traditional technical means to accurately detect faults and enrichment areas in the rock formations, while mechanical equipment using automation technology will be able to use computer technology to achieve artificial effects in special areas. In addition, the development of intelligent machinery has more and more extensive influences on human-computer interaction. In the mechanical design, automation technology is integrated into modern electronic products to better meet different needs. For example, for color blind patients, modern mobile phones can adjust the primary colors to Meet the needs of these customer groups.

Flexible application: Traditional mechanical processing and manufacturing lack the ability to

respond to business needs, and mainly lack the support of automation, intelligence and other technologies. Under the new situation, with the continuous development of human society, customers' needs for mechanical manufacturing are constantly changing This has brought a huge test to the mechanical design manufacturing industry, and also promoted the development of flexible application of automation technology. The flexible application of automation technology is mainly achieved by strengthening the effective combination of automation technology and mechanical manufacturing technology, building a scientific development view and intelligent modern production system to meet customer requirements for manufacturing capabilities. The combination of manual, automation and intelligence can improve automation the flexible application level of technology in the manufacturing industry and the whole process of mechanical processing and manufacturing are connected in series to form a chain reaction, which is conducive to the upgrade and improvement of the entire automation system. Under the new situation, the social and economic development is changing with each passing day. If you want to develop mechanical processing and manufacturing in the long-term, you must keep up with the pace of the technological age, pay attention to innovation, development and improvement, actively introduce advanced automation technology and production equipment, and at the same time promote automation technology The flexible application in the mechanical design and manufacturing industry will ultimately guarantee the development of my country's mechanical processing and manufacturing [3].

Virtualization application: The application of numerical control and virtualization technology is an important result of the development of modern automation technology in the field of machining and manufacturing. For some things and areas that are not suitable for human survival and human observation, the mechanical equipment produced by automation technology will to achieve the purpose of using numerical control technology for observation and production. For example, in areas where the environment is extremely harsh, it is impossible to contact people, and through numerical control equipment, efficient production and testing can be achieved to meet the needs. For the analysis of large databases, the use of automation technology to design and produce mechanical equipment, on the basis of man-machine programming and logic control, realizes the rapid processing of large data. In addition, the use of automation technology can also simulate certain scenarios to achieve the desired goals. For example, automation technology can be used to design mechanical equipment that simulates the space environment, achieve the purpose of training astronauts, and verify the results of an important technical experiment.

5. Conclusion

With the further development of the market economy, mechanical processing and manufacturing are facing fierce market competition. In order to comprehensively enhance market competitiveness and better adapt to changes in the market situation, relevant companies are required to continuously improve product quality and production efficiency, improve the working environment, and improve Safety production performance, eliminate backward technology and equipment, adopt advanced production equipment and technology, increase the application of modern machinery manufacturing automation technology, and realize its comprehensive development. To realize the modernization of China's mechanical processing and manufacturing, and to promote the rapid development of China's industry, in order to adapt to social changes and development, automation technology should develop in the direction of sustainability, scale, and greenness.

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