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Analysis on the Development of Mechanical Design, Manufacture and Automation in Modern Enterprises

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Abstract: With the acceleration of the digital process, in order to solve the hidden danger of data security, this paper takes data management as an example for in-depth research. In the data collection stage, detailed data collection policies are formulated to clarify business needs and reduce information risks. Advanced encryption technology and secure communication channels are adopted to ensure data transmission confidentiality. In the data storage stage, establish a permission management system to limit access and reduce the risk of internal abuse. Conduct regular safety audit and risk assessment to timely identify and correct potential safety risks. The research results aim to provide effective reference for data security management.

Keywords: Mechanical Design; Manufacturing; Automation; Modern Enterprise; Development Analysis

Introduction

Mechanical design and manufacturing and its automation play a key role in modern enterprises, promoting the improvement of production efficiency and product quality. However, it faces problems such as fast technology update and lack of staff skills. By discussing innovative technology integration and staff training plan, the bottleneck of technology update speed and employee collaboration is solved, and the sustainable development of enterprise automation production is realized.

1. Mechanical design, manufacturing and automation problems existing in the current enterprise

1.1 Technology update speed is too fast for enterprises to keep up with

The rapid progress of technology has brought about the continuous update of mechanical design, manufacturing and automation technology, which is not only an opportunity, but also a challenge. In order to maintain competitiveness in the competitive market, enterprises urgently need to follow the pace of science and technology, constantly upgrade the existing equipment and adopt new technologies. However, the speed of this technology iteration often leaves companies in a struggle, making it difficult for them to keep up in time. In the pursuit of leading technology, the enterprise is facing a huge investment pressure. Buying the latest mechanical equipment, implementing advanced automation systems, and providing relevant training for employees will undoubtedly require a huge investment. For some small and medium-sized enterprises, such an investment scale may be beyond their financial tolerance range, resulting in the lack of resources, unable to effectively cope with the market competition, thus affecting the position of enterprises in the industry[1]. In addition to financial considerations, companies also need to face the management and organizational changes brought about by technological upgrades. The introduction of new technologies may require reorganizing production processes, restructuring personnel structure, or even reshaping corporate culture.

1.2 The dilemma of man-machine collaboration

As automation increases, some employees may face a lack of skills to interact with advanced technologies. Modern automation systems usually involve complex hardware and software operations, and employees need to have the corresponding digital skills and system management knowledge. However, in some enterprises, the training level of employees may not be able to keep up with the rapid development of technology, leading to their relative inability to manage the use and management of automation equipment. This may not only lead to reduced operational efficiency, but may also limit the ability of enterprises to reach the full potential of automation. Communication to staff and equipment may be challenged due to the high integration of automation systems. Complex technical architectures and improved automation make employees more dependent on equipment operational data and feedback. However, the lack of effective communication channels

and a comprehensive understanding of the system, employees may have an insufficient understanding of the equipment status, troubleshooting and other aspects, making the problem can not be solved in time, thus affecting the continuity of the production process. Human-machine collaboration problems may lead to work safety risks. The lack of necessary skills and deep understanding of the system when dealing with highly automated mechanical equipment may increase the risk of accidents[2]. Improper operation and untimely response to equipment failure may cause potential safety risks in the workplace, and pose potential threats to the health of employees and enterprise property.

1.3 Data security and privacy issues

The collection of production data involves collecting information from multiple data sources, which may include sensors for mechanical equipment, monitoring systems on the production line, etc. Such data flow paths are complex, putting it at risk of potential data leakage and unauthorized access. Therefore, enterprises need to implement strong encryption measures and access rights management in the early stages of data collection, ensuring that only authorized people can access, process, and share this sensitive information. The process of data transmission also becomes a potential security vulnerability. During the transmission of information from the collection point to the data center or cloud platform, the data may be threatened by network attacks or theft. In order to ensure the security of data transmission, enterprises should adopt secure communication protocols, such as SSL / TLS, to ensure that the data is not disturbed, viewed or tampered with during the transmission process. With the continuous accumulation of production data, enterprises also need to pay attention to the reasonable protection of personal privacy[3]. This includes personally identifiable information about employees, customers and other related parties, as well as other sensitive data. Companies need to establish a sound privacy policy that specifies which information is collected and how to be used, and obtain consent from relevant parties if necessary.

2. Development and measures of mechanical design and manufacturing automation in modern enterprises

2.1 Strategic planning and resource allocation

Enterprises should formulate a comprehensive long-term technical plan to clearly define the priority direction and objectives of technology upgrading. This requires enterprises to carefully evaluate the current technology level, market trends and the trends of competitors, so as to select the most critical and the most potential to enhance the competitiveness of the technology field. This precise planning helps to avoid blind investment and ensure that resources are used in areas that really drive businesses. In addition to internal planning, companies should also consider building strategic partnerships with external partners. Technical cooperation is an effective way. Through cooperation with professional technology companies or research institutions, enterprises can acquire new technologies more quickly, share innovation results, and improve innovation efficiency. In addition, enterprises can also actively seek government subsidies and support, and participate in science and technology innovation funds or industrial development plans to obtain additional financial support. The introduction of government resources helps to reduce the financial pressure of enterprises, promote technology research and development and application, and improve the competitiveness of enterprises. Strategic planning and resource allocation require enterprises to consider internal and external factors, and invest in key technology fields through clear technical planning guidance[4]. The introduction of cooperation and external support helps to quickly access cutting-edge technologies and promote innovation. Through such a comprehensive strategy, enterprises can better adapt to the rapid development of science and technology, to ensure that they maintain competitiveness in the competitive market.

2.2 Staff training and development

Employee training and development is one of the important strategies for enterprises to cope with the challenges of the rapid development of automation technology. To ensure that employees have the necessary skills needed to interact with advanced technologies, companies need to invest in extensive training programs, including digital skills and systems management. First, training programs should focus on improving digital skills, including but not limited to data analysis, programming, and virtual technology. This helps employees to better

understand and apply the technologies involved in the automated systems, improve their digital literacy, and thus more flexibly adapt to the digital changes in the work environment. Training in systems management is also crucial part. Since automated systems often involve complex hardware and software operations, employees need to have a good knowledge of system management to be able to effectively monitor, maintain, and optimize the operation of automated equipment. System management training covers equipment troubleshooting, performance monitoring, and system optimization, enabling employees to use automated systems more skillfully to ensure competence in a highly automated production environment[5]. In order to make training programs more effective, enterprises can adopt a variety of training methods, such as online training, workshops and practical operations, to meet different employee learning styles and needs. The establishment of an internal tutorial system and knowledge sharing platform is also an effective means to promote the inheritance and promotion of skills through mutual teaching and experience sharing among employees.

Conclusion

In modern enterprises, the vigorous development of mechanical design, manufacturing and automation has significantly improved the production efficiency and product quality. However, challenges and opportunities coexist. Through technological innovation and staff training, enterprises can better adapt to the rapidly changing market demand. In the future, with the in-depth integration of artificial intelligence, big data and other technologies, mechanical automation will present a more intelligent trend. Enterprises can deepen digital transformation by strengthening data security and other measures. The courage to innovate and continuously improve the technical level will make enterprises achieve greater success in the fiercely competitive market.

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