Application of Automation Technology in Automobile Machinery Manufacturing

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Abstract—China's science and technology have become increasingly mature in today's society, and various fields of society will actively apply relevant advanced technologies to reshape the original operating model during the development process. In particular, the application range of automation technology has become more extensive, because automation technology itself has more advantages and cannot be replaced by many other traditional technologies. It can fundamentally improve the work efficiency of some manufacturing industries. Thanks to the application of high-precision automation technology, all work can be carried out continuously in accordance with established computer programs. In this way, the number of errors caused by human work is actually reduced, and the pass rate of the product can also take this opportunity to be significantly improved. When performing various tasks, workers in the mechanical manufacturing field will actively apply the most suitable automation technology according to their actual conditions, and organically integrate their valuable work experience with brand-new automation technology. This allows all work to be of higher quality in the implementation process. In the automobile production industry, since many parts are manufactured on the assembly line, if the advanced automation technology is actively applied, the production time of parts can be saved, and the assembly and processing work of the staff will be carried out in an orderly manner. In this way, the profits of the automobile manufacturing industry can be effectively improved and unnecessary cost input can be reduced.

1. INTRODUCTION
As information technology already has a more mature and stable application market in the modern market, many tasks will be actively applied to improve the original work efficiency by using relevant core technologies when implementing them. The widespread application of this technology is an inevitable trend of historical development, and the automotive machinery manufacturing industry can also make great progress under the support of this new technology. Moreover, this can also have higher production efficiency, provide more high-quality automotive products to the market, and provide an inexhaustible source of power for the sustainable development of related industries. Therefore, the popularity of automation technology can represent the country's production effectiveness to a certain extent, and reflect the country's actual development level from the side. It is closely related to the country's economic construction. The use of this new technology can also enable automobile production to have a safe and stable market environment, and provide users with better quality automobile products. This also effectively reduces the probability of car accidents and the probability of potential safety hazards. Under the current situation, the market environment has become more and more complicated, and the application of automation technology is extremely important for auto companies to occupy more market shares. Automation technology can produce more high-quality mechanical parts in a...
limited time, which determines the future development direction of many auto companies. This article analyzes and summarizes the operation mode of the automobile manufacturing industry at this stage, and proposes some practical application modes of automation technology. This will allow more employees of auto machinery manufacturing companies to reshape the working environment and have bright development prospects.

2. THE DEVELOPMENT TREND OF MECHANICAL AUTOMATION TECHNOLOGY

Regarding automation technology, the problem that technicians need to focus on is to enable more mechanical equipment to perform various tasks based on the knowledge of the computer system, so that it can actually replace human resources to complete various production plans. The use of this technology can make the parts production work itself more efficient, effectively reduce the probability of work errors, and avoid the waste of human resources. Not only that, with the support of this technology, the scale of the automobile manufacturing industry can also take this opportunity to expand, and effectively promote the dual improvement of manufacturing quantity and quality. Automation technology also has a very long history of development in China, and many related technologies have become more mature under long-term research and practice. Especially in the current situation where automation technology is widely used, many industries have made great achievements on this basis. It can be known from the automation market survey and analysis report that the economic benefits obtained from the application of automation technology in the automotive manufacturing industry account for 45% of all automated production industries, and the net profit obtained also accounts for as much as 92.70%. The operating income of many related listed companies has increased rapidly, reaching 44.65%. The embodiment of these data information can directly show the important value of the application of automation technology to the development of Chinese society. Not only in China's automobile machinery manufacturing industry, many foreign companies also actively use advanced automation technology when performing production tasks to effectively promote their own economic development. After China has introduced and researched automation technology, each field of work will be able to obtain higher work efficiency, and the production quality will also take this opportunity to significantly improve, which improves the work quality of China's machinery manufacturing industry from all angles[1] . Although the application of mechanical automation technology has effectively improved the pattern of China's manufacturing industry, there are still many problems that need to be solved in the process of application of this technology. Enterprises fail to apply various technologies reasonably according to their own conditions, seriously reducing the actual effects of automation technology. For a long time, China has not paid much attention to the training of relevant technical personnel, although many companies have realized the importance of applying advanced technology. However, there are no internal professionals to analyze the market development trend for the company, nor to keep up with the times and improve the original work procedures in time. This has caused many companies to be unable to keep up with the development trend of the times in the course of development, dynamically adjust their work patterns, and fail to implement new core technology applications. Therefore, in the course of development, relevant companies should take a longer-term perspective on their development and continue to introduce advanced technical talents so that all work can operate in an orderly manner.

3. APPLICATION OF MACHINERY MANUFACTURING AUTOMATION TECHNOLOGY IN AUTOMOBILE INDUSTRY

The application of automation technology is very comprehensive, and you still need to think about many aspects when implementing it. Its core technology value is not limited to the application of information technology to replace manual production methods, but actively absorbs valuable experience in traditional craftsmanship, and integrates the required intelligent technology according to the actual needs of the automobile manufacturing industry. This can significantly reduce the probability of errors while ensuring production quality. In addition, this technology still requires professionals to strictly control the entire operating procedures when it is implemented. Only in this way can it be
ensured that all work can be carried out smoothly within the established procedures. The automation technology used in China is divided into multiple categories, such as the application of numerical control technology, the implementation of integrated technology, and the implementation of flexible automation concepts. Especially in the important period of economic construction, the trend of application of automation technology in various industries in China is shown in Figure 1. The number of industries applying automation technology is showing an increasing trend, and the gap rate of automation technology is becoming lower and lower with the support of more and more complete automated production lines.

![China's automated Production Line Supply and Demand Quantity](image)

3.1. Application of Integrated Technology in Automobile Machinery Manufacturing Industry

In recent years, China's science and technology have been continuously improved, which has effectively helped various industries to obtain higher work efficiency in the complex market environment, and also achieved more obvious achievements. In particular, automation technology has played an important role in various fields, which has had an extremely important positive impact on various industries and promoted the smooth development of each work field. This also allows the automobile manufacturing industry to take a step forward on the original basis and achieve more technological breakthroughs. In many automobile manufacturing companies, factories will actively apply advanced automation technology to unify the operation of various production equipment, and integrated technology has emerged in this production mode. Integration technology mainly relies on the centralized control system to perform various tasks. It can finely classify each link in automobile production through the application of various production technologies, and provide suitable control technologies for different types of work. In this way, the management and operation of each production link can be effectively done. It has also played an extremely important role in the automobile manufacturing industry, and its application rate will also increase significantly [2]. Due to the increase in the number of manufacturing tasks and the increase in scale, many production tasks are more difficult. When the cloud technology is properly applied, the management subsystem is born. Many centralized control tasks can be more targeted and efficient, and effectively improve the efficiency of each work link.

Through the past operation methods of the automobile manufacturing industry, it is obvious that each type of mechanical equipment cannot form a good cooperation when it is operating. However, in today's society where the manufacturing industry is becoming more and more perfect and supported by various new technologies and scientific and reasonable provisions, various jobs in the automotive manufacturing industry can be of higher quality. Especially in the process of continuous application of integrated technology, different equipment can operate efficiently in their respective positions, and the cohesion of various production processes can also be guaranteed by this opportunity. This not only
reduces construction time, but also allows work efficiency to be significantly improved by this opportunity.

3.2. Application of Numerical Control Technology in Automobile Machinery Manufacturing Industry

Analyzing from the perspective of numerical control technology, auto parts need to apply various automation technologies in the manufacturing process. It not only needs to actively apply advanced automation control skills according to the actual situation, but also needs to integrate various computer systems. Only in this way can the wasteful work generated in the manufacturing process be effectively reduced, production efficiency can be significantly improved, and all work can be completed efficiently and conveniently. Through the use of numerical control technology, technicians can get the help they deserve when operating in various work links. The efficiency of automation technology is promoted to the best state, and the production process also has stronger safety features. However, compared with other types of automation technology, CNC technology itself has stronger complexity, and its application program is more comprehensive. When the automobile machinery manufacturing industry is in operation, the operators should have a stronger professionalism and a thorough understanding of the automobile machinery manufacturing process, and they also need to have a stronger sense of responsibility. Only in this way can I concentrate all my energy on each work link, so that there is no error in the implementation of CNC technology.

Under the current situation, automobile manufacturing still needs to conduct more in-depth research when applying numerical control technology in various industries, and there will inevitably be some problems in the application of high-precision technology. In addition, many more advanced technologies have actually been monopolized by foreign markets. If many automobile manufacturers do not have strong strength, they will not be able to fully tap the maximum value of CNC technology [3]. For this reason, relevant staff need to consider many aspects when performing functions and tasks, and research various CNC technologies with targeted functions according to the actual needs of the domestic market. Only in this way can the problem of technological monopoly be better solved, the domestic numerical control technology has a stronger comprehensiveness, and the various problems existing in the numerical control technology can be effectively improved.

3.3. Application of Assembly Automation Technology in Automobile Machinery Manufacturing Industry

In the process of implementation of automobile machinery manufacturing work, according to the nature of the assembly work itself, it can be understood that it needs to be actively applied to assembly line production work, so that the ultimate performance of the car can be fundamentally guaranteed. When the assembly work is implemented, if advanced science and technology are not applied, a lot of human resources will inevitably be utilized. This also requires a lot of working time. This will not only make the error rate in the composition work also extremely high, but also may cause obvious safety accidents after the finished car is put into use. However, if the assembly work can actively apply more advanced automation technology in the implementation process, it can effectively solve the various problems that existed in the past. Technicians need to design the assembly line operation form according to the actual production needs of the enterprise, so that all assembly work can be smoothly connected and higher efficiency [4]. We can use the assembly line as the main body of the implementation of automation technology, and use this as the center to carry out various new work areas and apply the most suitable equipment. Enterprises should regard production parts as the main object of automation technology knowledge, so that the applied computer system can determine various parameters of production parts. Only in this way can the assembly work be implemented with higher efficiency, effectively reduce the time required for assembly of parts, and reduce various errors caused by manual operations. When the assembly work is over, the automation technology can also use the sensor technology to obtain the data information of the production car, including the temperature and humidity of the environment. Moreover, companies can do a good job of feedback based on actual conditions, which can effectively reduce the formation of parts assembly errors.
3.4. Application of Flexible Automation Technology in Automobile Machinery Manufacturing Industry

The birthplace of flexible automation, a new type of operation technology, is located in the UK. It is an extremely basic automation technology that uses the basic data information of the product as an important reference basis for the implementation of various tasks. It can carry out a detailed analysis of every piece of data and information contained therein, so that all production lines can meet the established standards when they are in operation [5]. The implementation of this technology mainly relies on three components. The first is the application of computer systems, the second is the use of the most advanced numerical control technology, and finally, the appropriate information technology should be applied according to the actual needs of the production work. When applying computer technology, we should regard various instructions as objects and complete corresponding input operations. In addition, we should use relevant equipment to carry out output work on this basis, and actively combine the actual situation of the processing machine tool to enable the equipment to perform various tasks according to instructions. In this way, various tasks can be carried out smoothly with the support of automation technology to produce the most suitable mechanical raw materials. When carrying out automobile machinery manufacturing work, flexible application of flexible automation technology is extremely important for the entire production chain, which can effectively reduce labor costs.

Compared with the composition technology, the flexible automation technology itself also has a lot in common with it. When the composition technology is implemented, the product category is generally used as an important basis for work. It can finely classify its types after the production work is completed, and the management work will also have distinct streamline characteristics when it is implemented. For the flexible automation technology applied at this stage, CNC technology occupies an extremely important position. When the manufacturing work is officially launched, product quality testing needs to be completed in the first time. Workers should reasonably control the production process according to actual needs, and operators also need to report on the production status in real time, so that they can dynamically adjust the work procedures [6]. Taking production workpieces as objects, the use of this advanced technology not only allows computer programs to play an important role, but also enables higher efficiency in protection and transportation. Not only that, the use of CNC technology can also help improve production efficiency.

3.5. Application of Automation Control Technology in Automobile Machinery Manufacturing Industry

In the automobile manufacturing industry, the application of automation control technology is extremely important, and it has an irreplaceable important position. When the mechanical manufacturing work is officially started, if there is a need to apply the stamping operation, it is necessary to apply the control technology flexibly. In this way, the status of the production line can be modified in time to make various operations more efficient during implementation, and the safety of production can be significantly improved by this opportunity [7]. Among them, the use of emergency devices in the control system is extremely important. Especially in automobile machinery manufacturing where the production process is relatively complex, the application of this device can enable problems in the automobile manufacturing process to be discovered in time. Once a variety of fault problems occur, the system can also promptly report the existing problems to the staff, and at the same time remind the staff to stop work in time, and immediately implement maintenance work. This can significantly reduce the life threat of safety accidents to staff. When implementing safety protection measures, the control system should also be taken as an important part. This safety protection system should be set in the man-machine operation page. Moreover, it needs to fully integrate the core connotation of the fault diagnosis system and the neuron control system. Only in this way can the entire automobile production process be more scientifically rational.

4. Conclusion

In summary, in recent years, China's science and technology have achieved great achievements in the world. Moreover, it has played an important value in the automobile manufacturing industry. In particular, the use and
promotion of automation technology not only effectively reduces the operating costs of related work, but also enables production work to have higher quality. Not only that, compared with the previous production technology, the application of this new technology can minimize the probability of work error, so that the overall quality of production work can be significantly improved. Automobile companies can also occupy a higher market share in a complex market environment and strengthen their competitiveness [8]. As far as the current situation is concerned, although China has made certain achievements in the field of automation technology, it still needs relevant professional and technical personnel to continue to innovate in all aspects. Only in this way can it promote the smooth development of the automobile machinery manufacturing industry and make it have bright development prospects.

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