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Brief Analysis of Automobile Quality Management Innovation under the Background of Intelligent Manufacturing

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ABSTRACT. *This paper mainly introduces the evolution and expansion of the function of the real-time monitoring mode of production process, and puts forward feasible optimization and improvement strategies. Then it discusses the practical significance of the evolution process of the connotation of data acquisition, and comprehensively analyses the innovation of automobile quality management, in order to provide valuable reference for the industry.*

KEYWORDS: *Real-time monitoring mode; Data acquisition connotation; Quality management innovation*

1. Preface

Fully implementing the strategic guidelines of “Made in China 2025” indicates that China is gradually transforming from a big manufacturing country to a strong manufacturing country. Whether Germany's “Industrial 4.0” or “Made in China 2025” is an industry system reform centered on Intelligent technology.

2. Evolution and Development of the Function of Real-time Monitoring Model for Production Process

In the actual production process, the advantages and functions of the real-time dynamic monitoring mode are embodied in the following three aspects: Firstly, the real-time monitoring mode is not only the core of the intelligent manufacturing industry, but also the essential industrial software. For example, statistical control system, enterprise resource management system, manufacturing execution system and product production cycle management system, etc.; Secondly, industrial electronics, which integrates sensing, computing and communication functions, is the main hardware facility of intelligent manufacturing system, such as two-dimensional code recognition technology, RFID technology, remote sensing technology and numerical control technology. Thirdly, innovative manufacturing technology should take planning and design as the starting point to provide

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necessary conditions for actual production. Obviously, only by promoting the organic integration of these three aspects, can intelligent manufacturing be truly realized.

Chery automobile manages the whole vehicle after off-line production. The ultra-high frequency anti-disassembly RRID tag is used as the data carrier of each vehicle; the RFID handheld terminal is used as the main data acquisition tool, and the front-end data is unified managed by the vehicle traceability system platform. The system can be extended to the production management in the front section, and then to logistics management and after-sales traceability.

Figure. 1 TIGGO8 RFID electronic tag

3. Feasibility Strategies for Improving Real-time Monitoring Level of Production Process

In recent years, it has entered the “industrial 4.0” development cycle, and the manufacturing mode has gradually changed from large-scale production to private customized production mode.

With the change of the structure of the automobile consumption market and the improvement of the level of product manufacturing technology, the production enterprises should adopt the flexible production mode of multi-variety and mixed-line. From the macro point of view, there are essential differences between multi-variety mixed-line production mode and single-variety batch production mode.

Taking the manufacture of Chery white body as an example, it has entered into automatic and flexible production. Automation and flexibility of car body can directly reflect the production capacity of production line. Chery can add corresponding GATE combinations according to the number of models. Taking the company's A3 line as an example, by switching three sets of fixtures, four models can be produced simultaneously, namely M11, M12, A01A and A01B.

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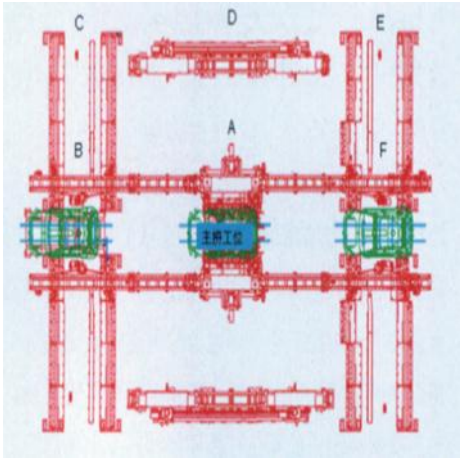
A-B-C-D-E-F-A can be moved by several groups of longitudinal and transverse slides. A-B-A can also be moved by small cycles, so GATE of different models can



be put into welding position. As shown in Figure 2.

Figure. 2 Switching schematic diagram of main the fixture for different vehicle types by cyclic sliding

1. Return position 2. Working position 3. Feature measurement points

Figure. 3 Selecting feature points to measure repetitive positioning accuracy

In this process, the real-time process monitoring and control system should be implemented, the data format of relevant testing equipment should be set up beforehand, and the relevant quality data information should be applied synthetically. As shown in Figure 4.

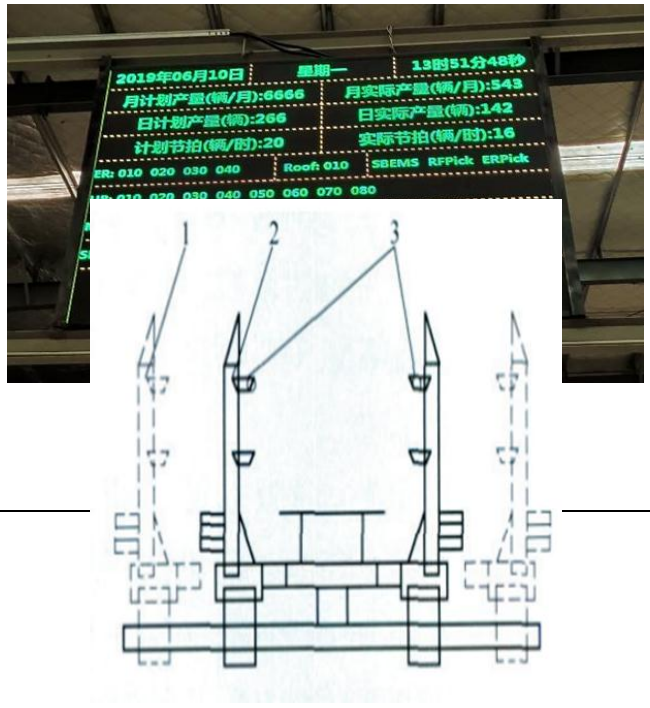


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Figure. 4 Real-time monitoring of the welding process of the white body of Chery Commercial Vehicle

4. The Practical Significance of Data Acquisition Process Evolution

Usually, the data modules involved in production enterprises mainly include the following two types: one is the information related to the production status of enterprises, and the data related to production plans, sales plans and inventory management plans; the other is the data collected by sensors and related to real-time feedback information. These state information includes not only the information related to production process, but also the operation state information of mechanical equipment. If the processing information can not be refined, such as equipment status information, fixture status information, power head status information, etc., it will make the processing mode mismatch with flexible working environment and affect the quality of product manufacturing.

For this reason, the automobile industry should apply statistical process control system, and pay more attention to information collection and processing. In addition, the full implementation of the automobile recall system in China also urges enterprises to take the above measures. In order to promote the development of the automobile industry and enhance the level of production informatization, integration and intelligence, automobile manufacturing enterprises can take the following measures.

(1) By continuously optimizing and improving the monitoring system, such as q_STAT and other analysis software, the production efficiency can be further improved.

(2) Relying on automatic identification technology, remote sensing technology, information acquisition technology and communication technology, the bar code of products on the production line is gradually transformed into electronic chip technology.

As a result, the informationization level of enterprise production process has been effectively improved, and the comprehensive benefits of the enterprise have been guaranteed.

5. Innovation of Automobile Quality Management

5.1 Quality Management Visualization

Quality management visualization is to improve the level of automobile quality management through the construction of electronic information system. In the process of using this management mode, managers can manage and control the manpower, production process and customers in production by means of remote monitoring, so as to reduce the problems and ensure the efficiency of management.

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In automobile quality management, the application of visual management mode not only improves the quality of automobile production, but also reduces the problems existing in traditional management and enhances the safety of automobile use.

5.2 Quality Management Processing

This kind of management mode is mainly a way to improve the quality of automobile management through the improvement and innovation of business process. In automobile manufacturing, because of many factors, there are some complications and uncertainties in production, which increases the difficulty of automobile quality management. Through the application of process management mode, we can sort out all links of automobile production, such as raw material processing, workshop management, quality inspection, transportation and so on, which avoids danger, and improves the linkages of all links, and strengthens the production effect. At the same time, the effective application of process management also reduces the restriction of adverse factors on automobile production process, and further improves the efficiency of production operations, so as to thoroughly improve the quality of automobiles and promote the further development of enterprises.

5.3 Quality Management Integration

The core of this management mode is electronic information technology, which collects, collates and analyses the quality information of automobile production process, and comprehensively manages the behavior of relevant departments. In this management mode, information is the key. The integration of information can accelerate the process of information construction and help enterprises integrate information resources. Optimizing and improving production activities and business processes, realizing high integration and sharing of information, improving the efficiency of quality information utilization will ultimately improving the overall quality of automobiles.

6. Conclusion

To sum up, in the context of intelligent era, automobile manufacturing enterprises should change the concept of quality management and apply various diversified production technologies and equipment. In order to improve production efficiency and product quality, we should promote the stable development of enterprises and the continuous progress of manufacturing industry.

References

[1] Feng Xingyuan (2018). Research on Innovation and Practical Significance of Automobile Quality Management. Science & Technology Vision, vol.236,

ISSN 2616-7433 Vol. 1, Issue 6: 38-43, DOI: 10.25236/FSST.2019.010608

no.14, pp.12-13.
[2] Li Ming (2018). Analysis of Present Situation, Technical Equipment and Quality Management of Modern Automobile Maintenance. Internal Combustion Engine & Parts.
[3] Cai Jiaohua (2011). Application of COMAU Robot Laser Online Detection in Chery A3 Welding Line. MW Metal Forming.