Analysis on the New Model of Computerized Production Control MES Tobacco Enterprises under Big Data

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Abstract. In the past 30 years, the rapid development of computers, and derived many high-end technology, in a variety of production hot big data is one of them. Tobacco companies in the 21st century in the endless era of anti-smoking policies stand out, must take action, both with the times, but also close to the status quo of their enterprises. Learning to use the advanced quality management methods used in cigarette production at home and abroad can not only improve the economic benefits of enterprises, but also meet the social benefits, and improve the operation efficiency of enterprises while ensuring the quality of products. Based on the difficulties faced by cigarette factories and the characteristics of the industry, the author expounds the importance MES the new mode of computerized production control under big data to tobacco enterprises in order to improve the quality management of tobacco enterprises.

Keywords: Tobacco Enterprises, MES, Computerized Production

1. Introduction
With the maturing of computer big data technology and the faster and faster pace of global economic integration, the competition faced by tobacco enterprises in China will be global, from domestic to international, the market capacity will expand and the challenges will be more. Although China's tobacco monopoly system, but with the increase of integration, the competition between domestic tobacco enterprises is becoming more and more fierce, and once the monopoly system is liberalized, China's tobacco enterprises will be involved in a global market competition. Practice has proved that enterprises rely on the market, the market depends on products, products rely on quality, and the overall meaning of quality competition has become the key to market competition. Rely on big data, apply MES strengthen quality management, improve product quality, enhance corporate image, the importance of tobacco enterprises is self-evident, combined with the author's work experience in Luoyang cigarette factory in Henan, talk about a little understanding of the new mode of MES computerized production control.

2. Present situation of domestic tobacco industry and development of tobacco production in big data era
China is the world's largest country in tobacco production and consumption, the tobacco industry occupies an important position in the national economy, but in recent years, due to the increasing
saturation of the domestic market, as well as the rise of the world-wide anti-smoking campaign and with the accession of China WTO, the Chinese tobacco industry is facing more serious challenges. The foreign tobacco industry has realized that scientific and technological progress has become the only way to survive and develop the tobacco industry, so it has invested a lot of money in the application of advanced production mode, and has adopted new technology, new equipment and new products in large quantities to seek more market share and living space\[2\]. In recent years, some domestic enterprises have also begun to invest in technological transformation, and some large and medium-sized cigarette production enterprises have begun to introduce advanced equipment abroad on a large scale, and have also reached a high level of production automation. At the same time, the enterprise information construction is in the ascendant.

3. Characteristics and problems of tobacco industry production

3.1. Characteristics of tobacco production

The domestic cigarette market is generally a market with saturated production capacity, so for the tobacco industry, timely collection and processing of a large number of market information, grasp the internal dynamic production, finance, management and other information, is the key for enterprises to make correct decisions\[3\]. At present, the tobacco processing technology of domestic enterprises is basically similar, the level of processing machinery and equipment is similar, and the types of raw materials are basically similar. However, in the use of computer and information technology to assist formulation, improve the level of automation and control of processing, is a major problem facing tobacco enterprises. The production mode of tobacco industry belongs to the process type production, mainly through the processing and packaging of tobacco to complete the whole value-added process. Its production has the following three characteristics :(1) the planned characteristics of production: because the tobacco industry national implementation of special control, the total amount of production by the state to implement unified macro control, tobacco enterprises on the basis of national plans to optimize the control of brands, reduce costs. (2) Characteristics of the production process: Tobacco production is a mass production, less variety production. (3) Production characteristics of automatic assembly line: the production process is more mature, control production automation degree is high. It should be said that the tobacco industry has some advantages over other banks in the accumulation of funds, so the investment in hardware and equipment is more adequate, and the implementation of information engineering in enterprises has a hardware basis.

3.2. Current issues

Combined with the new international and domestic policy situation, market situation and production situation, we sum up the following problems and devote ourselves to solving these problems, meeting challenges, grasping opportunities, turning passivity into initiative, and taking a road of innovation and development, leading the trend\[4\]. At present, we need to recognize these points to resolve the adverse factors at home and abroad. (1)The MES of the tobacco industry has changed from traditional management to digital and intelligent, and the MES of Luoyang factory will be transformed from traditional MES to new intelligent and intelligent. (2) Weak production process control means lack of process data, resulting in a single process control link. (3) Analysis and evaluation of post-accounting production process and production quality analysis are carried out after the event, resulting in the problem is not timely, analysis and evaluation can only be post-accounting. (4) Continuous improvement is not supported by data analysis and evaluation after the event, production process data, quality data are after the completion of production results data, lack of intermediate process data for continuous improvement support\[5\].

Looking at the characteristics and present situation of tobacco industry, we still have many problems. (1) The production plan is controlled and the autonomy is weak. (2) Lack of effective cost control in the production process. (3) The quality data collection automation degree is low. The quality control mode uses the original result control. (4) Advanced equipment, relatively backward equipment management.
(5) Data sharing is poor and more information islands are formed within enterprises.

4. MES framework
With the development of computer technology and the expansion of application field, the complexity and scale of operating software increase. The first problem to be solved in software enterprises is the improvement of the applicability of software in enterprises, and the development of customization has become the most effective solution. However, the development of customization is time-consuming, so the design of standard modules to a certain extent, and then reuse of standard modules, customized development for some special needs has become a major way. The definition of software standardization has many forms, among which the common function points are reused in two or more different software development projects, which solves the problem of repeated work in the process of software development[6]. To some extent, it can effectively improve the efficiency of software development, but also ensure the quality of software development. MES three-layer frame structure is shown in Figure 1.

![MES Structure of the three-tier frame](image)

**Figure 1. MES Structure of the three-tier frame**

5. Computerized production control and management of MES based on big data era
"Golden Leaf Manufacturing Platform" is the control application platform of Henan Zhongyan Industrial Company in production execution management and subordinate tobacco factory. As one of the supporting plants of "Jinye manufacturing platform" in the future, in order to realize the seamless connection between enterprise system business, function and technology and Jinye Manufacturing Platform, the construction of MES system of Luoyang Factory adopts the unified interface standard, unified production management standard, unified data management standard and unified R & D technical standard, which are as follows : (1) simple, appropriate and professional operation interface; (2) synchronous scheduling mode with Henan Zhongyan Industrial Company; (3) standardized integrated system; (4) advanced and stable superior products. Figure 2 shows MES system support for the integrated quality control platform -- the gold leaf manufacturing platform.
5.1. **MES application layer**

The application layer will be directly aimed at the specific implementation process of a certain business, is an abstraction of the business, the specific business reflected to the actual code or module, through the application layer to effectively and reasonably schedule the production resources, complete the production process management and control, at the same time can collect the production data and status of the first line. Also includes other applications such as interfaces with PCS, BPS.

5.2. ** MES module layer**

MES module layer is abstracted for the existing basic business and encapsulates the common modules involved in it to form common components with unified interfaces. They complete the same functions in different application layers[7]. The module layer can also provide the basis for the relationship definition of each component module in the manufacturing execution system. It forms the whole system infrastructure according to the mutual dependence or logic relation.

5.3. **MES infrastructure role**

MES basic layer software architecture is the foundation of the whole software part, which mainly covers the distributed environment, network communication interface, database and various servers involved in the operation of the system.

6. **Conclusion**

Bringing in big data with the times and using the new production model MES computerized production control to comprehensively improve the ability of tobacco enterprises to control total quality will not only have a vital significance for the development of enterprises, but will also have a profound impact on society. It is the most critical factor in the competition for the market. Whoever can provide products or services satisfactory to users in a flexible and fast way will win the competitive advantage of the market. In short, the 21st century is the century of quality. Under the current economic situation, enterprises should understand the connotation of total quality control more deeply and comprehensively, and then, guided by the correct direction, dare to innovate themselves, creatively apply new technologies to open up new production and control models, and raise the quality management level and product quality level of enterprises to a leading level in the industry.
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