

Analysis of the Intelligent Maturity and Grade Concept of Chinese Patent Medicine Manufacturing

Jing Lingjie

Jiangsu University, Zhenjiang City, China

Abstract: With the development of modern science and technology, Chinese patent medicine manufacturing enterprises began to use intelligent equipment, intelligent system, big data and Internet and other technologies to realize the automation and intelligent management of the production process. This paper mainly starts from the development needs of Chinese patent medicine manufacturing industry, studies the intelligent maturity and grade concept of Chinese patent medicine manufacturing, and can also put forward measures for the development of related industries for its reference.

Keywords: Chinese patent medicine manufacturing; intelligent maturity; intelligent maturity grade

1. Introduction

The manufacturing of proprietary Chinese patent medicine can provide a basis for the application of traditional Chinese medicine, and the focus of the development of this industry is to make the manufacturing and production of drugs in line with the quality of the national regulations. With the development of social science and technology, it is also a challenge for the development of proprietary Chinese medicine manufacturing industry. We should be able to give full play to the value and advantages of proprietary Chinese medicine through advanced manufacturing technology. In particular, the promotion of intelligent manufacturing strategy makes the further development of Chinese patent medicine manufacturing. To enhance its intelligent maturity level is also to enhance its intelligent manufacturing ability.

2. Intelligent development needs of Chinese patent medicine manufacturing

2.1 Requirements for intelligent technology

The continuous development of information technology has put forward a certain demand for the technological development of the manufacturing industry, which is more conducive to the Chinese medicine manufacturing industry to achieve the goal of intelligent development. In the process of development, the effective application of intelligent technology can accelerate the process of its manufacturing development, not only can simplify its manufacturing process, but also make its manufacturing development more convenient, and can effectively make up for the deficiency of traditional production technology.

2.2 Requirements for upgrading and transformation

In recent years, the intelligent development of Chinese patent medicine manufacturing industry is perfect. In order to keep up with the development pace of Chinese manufacturing, it is required to the upgrading and transformation of the industry and accelerate the development process of intelligent manufacturing. The application of intelligent development technology, the construction of Chinese patent medicine manufacturing intelligent production workshop, with the intelligent production line can effectively improve the management level of enterprises.

2.3 Requirements for intelligent control technology

In the current process of intelligent development of Chinese patent medicine, the level of related intelligent control technology is not high enough. The flexible integral control and the industrial intelligent control method based on the conversion control of adaptive equipment are mainly used in

manufacturing industry of Chinese patent medicine. In order to improve the intelligent level of Chinese patent medicine manufacturing, it is necessary to effectively enhance the intelligent control in manufacturing and production.

2.4 Demand for intelligent quality supervision technology

At present, the demand for Chinese patent medicine at home and abroad is still large. At the same time, with the development of The Times, people's demand for health care has gradually increased. However, in the large-scale manufacturing of Chinese patent medicine, the acquisition of raw materials has great risks and uncertainties, and the lack of effective supervision of this link. Secondly, the quality and health and safety problems in the process of production and manufacturing, if the detection is not in place, it will affect its use. In addition, in the storage and management of drugs, it is also necessary to use advanced technology and equipment for effective management, in order to ensure the quality of Chinese patent medicine manufacturing products^[1].

2.5 Demand for intelligent sales technology

Based on the development of intelligent technology, Chinese patent medicine manufacturing enterprises should not only make effective use of intelligent technology for manufacturing activities, but also use the development of digital to change the sales mode by integrating online resources and form their own digital sales mode, which can realize cooperation with medical e-commerce, also can realize with pharmaceutical business online and offline all-round cooperation. In addition, the digital technology can also be used to achieve an effective analysis of customer data.

3. Analysis of the intelligent maturity and grade concept of Chinese patent medicine manufacturing

3.1 The intelligent maturity of Chinese patent medicine manufacturing

Intelligence refers to the use of various advanced technologies and means, so that the traditional industrial process has a certain automatic adjustment function, which can complete the predetermined task according to the predetermined requirements, so as to achieve automation. It can be seen from the definition, the so-called intelligence is the use of certain methods and technologies to transform the traditional process, so that it has the function of automation, so as to realize the optimization of products. Based on modern information technology and computer as the core, intelligence digitized and automated the production and processing process of traditional TCM, so as to realize real-time monitoring and control of the production process of TCM.

3.2 Grade of intelligent maturity of Chinese patent medicine manufacturing

To some extent, the higher the level of intelligent maturity of an enterprise, the higher the ability of its intelligent production and manufacturing. At the same time, it is also the basis for enterprises to take certain management measures to improve their intelligent ability under certain conditions. Its intelligent maturity level mainly has the following five aspects.

3.2.1 Planning level

This level mainly refers to that the enterprise has begun to have the awareness of implementing intelligent manufacturing, and began to plan to implement it. This means that enterprises can realize the importance of database construction in intelligent manufacturing, and at the same time can achieve intelligence in the individual manufacturing links of enterprises. To a certain extent, some enterprises at this stage have intelligent infrastructure, and can record and supervise production data to further build intelligent manufacturing systems. However, enterprises in this stage still stay on the surface of database construction and local intelligent improvement, and do not really start intelligent manufacturing.

3.2.2 Specification level

Enterprises at this stage have initially formed the intelligent manufacturing related plan, began to enter the process of intelligent manufacturing. Enterprises can apply intelligent production equipment

and related technologies in the manufacturing of some core links, to make the quality of the product have further improve, at the same time, can form their own real-time database. The database can timely respond to the market demand of customers, improve the production capacity of the enterprise, and record and supervise the data, so that it can further reduce the production cost of enterprises, and basically realize the information development of the process.

3.2.3 Integration level

If the enterprise has entered this stage, it means that the enterprise focus on intelligent manufacturing has changed. The enterprise began to change from paying attention to the intelligent development of a single link to the development of multiple links, emphasizing the construction of the database of each link, including the digital development of manufacturing business, manufacturing equipment and manufacturing units. And realize the integration of the core business database construction, can realize the sharing of information resources within the enterprise.

3.2.4 Optimization level

Enterprises at this stage can realize the integrated construction of their internal design, production and sales management system^[1]. It realizes the integration between the enterprise and the factory, and can start to analyze the data and data collected in the production process, and each system and business process can be upgraded and optimized, so as to realize the interaction with the development of the external information world. The development from integration level to optimization level is a process of qualitative change, which can rapidly improve the level of enterprise intelligent manufacturing.

3.2.5 Leading level

This stage is the highest level of intelligent maturity level, at this stage of the enterprise its intelligent manufacturing ability is very high, can realize intelligent equipment and artificial effective connection, the construction of data analysis platform has been completed, in each link of intelligent manufacturing information can maximize utilization and optimization. At the same time, enterprises can realize the intelligent production of each link with the help of intelligent equipment, and the equipment can be adjusted by itself to cope with different demand changes. In terms of the delivery speed control, cost control and quality control on the level of intelligence, the enterprises has been at the highest level. At this time, the enterprise can serve as the intelligent manufacturing leader in the industry.

4. Measures to improve the intelligent maturity and grade of Chinese patent medicine manufacturing

4.1 Intelligent production

4.1.1 MES and electronic batch record

In the process of enterprise intelligent production, the application of MES can effectively realize the transfer of the upper ERP management to the lower level of production control information, can schedule the production management of enterprises, and be responsible for the implementation of relevant content, which can play a good communication role. Electronic batch record is an important implementation content in MES, which can effectively replace the traditional paper management, realize the electronic process record in the production of Chinese patent medicine manufacturing, and truly realize the paperless management of each process. Electronic batch recording can improve the quality and efficiency of enterprise manufacturing production, and reduce the cost to a certain extent. More importantly, electronic batch recording can effectively meet the needs of big data management. It can effectively manage the data collection, and then realize the dynamic analysis and processing, so as to facilitate the online monitoring, and can give early warning or timely deal with the related problems. Such a processing method can replace the manual operation of the operator, facilitate the audit of the record documents, and then improve the level of data audit. The MES can regulate the data within the entire process, and you can directly compare it with the pre-set standards and process the abnormal data. Related staff only need to pay attention to abnormal data, which largely simplifies the production process, improves production efficiency, and can have a positive impact on reducing the utilization rate of inventory and capital.

4.1.2 Application of intelligent equipment

Intelligent manufacturing level largely depends on the application of intelligent equipment, in order

to effectively improve the efficiency of proprietary Chinese medicine manufacturing, we can use intelligent manufacturing equipment to replace the traditional artificial, simplify and make production process more efficient, and the application of intelligent equipment can better improve the quality of products, can also reduce the labor cost. In the product sampling inspection, recording and other aspects to improve the level of intelligence, so that compared with manual operation, the efficiency can be higher guaranteed.

4.1.3 Process analysis technology

In the detection of the key information parameters of the product, the main application is the PAT technology^[2]. Among them, the content, hardness, release degree and brittle degree of Chinese patent medicine products were sampled and tested manually. The application of PAT technology can realize intelligent sampling and detection, and can be set regularly. During the monitoring, certain reference standards can also be set, so as to realize online analysis and comparison, and then the results can be directly fed back to the equipment, so as to realize the real-time adjustment of product process parameters. When the production process is finished, the PAT technology can effectively ensure that the product meets the quality standards for release. In addition, PAT technology can also promote the continuous development of quality control technology.

4.1.4 Building a global supply system

In the process of intelligent development of proprietary Chinese medicine manufacturing, enterprises should adapt to the trend of the development of The Times, follow the form of the development of globalization, and to construct their own supply chain globalization system. Thus, it can effectively integrate relevant activity information resources and respond to the needs of market customers in time, so that enterprises can achieve global development in procurement, production and quality control.

4.2 Intelligent supervision

4.2.1 Big Data management

The application of big data technology can provide enterprises with more production information and data, help Chinese patent medicine manufacturing enterprises to obtain product data information that was not available in the past, and can effectively analyze and manage these data, and take this as the basis for enterprises to constantly improve themselves in the manufacturing process.

4.2.2 Quality supervision technology

For the development of Chinese patent medicine manufacturing enterprises, the quality and safety of drugs is the key content. The application of intelligent supervision technology can improve the efficiency of drug quality management, and replace the traditional paper and on-site inspection methods with intelligent supervision technology. Standardized quality supervision interface Settings, can make the regulatory task more efficiently, and can real-time access to related product data, the quality and the relevant data of drug production process regulation, at the same time, through the big data information technology, data analysis mining, can realize the manufacturing each process regulation, also can guarantee the comprehensive and real-time regulation. The efficiency, level and quality of supervision can be guaranteed.

4.2.3 Supervision of production materials

The supervision of the production materials needed in the manufacturing of Chinese patent medicine can ensure the quality of the products from the source. In the manufacturing process of enterprises, the technology of material traceability management can be further upgraded, and the bar code technology can be effectively played to achieve the effective supervision of the source of materials. It can not only guarantee the quality of the manufactured products, but also be conducive to the effective supervision of the regulatory authorities. Among them, the application of QR code technology is the most convenient and efficient.

4.3 Intelligent packaging

The development of intelligent technology can also be further applied to the packaging of products. With advanced intelligent means instead of the traditional manual operation, we can achieve the transformation of product packaging^[3]. For the application of intelligent packaging machine, three

aspects are mainly emphasized: the first is the arm end operation tool, the material delivery device, and the identification control system. This can improve the efficiency of product packaging, so that in every process of product packaging, the automatic packaging machine, auxiliary equipment and delivery device can achieve an orderly collection and combination. In the whole process, through the use of various device technologies, we can ensure that the specific device combination can play the maximum efficiency. When one end of the device starts to work and the product is delivered, the packaging materials can work to realize an orderly packaging process, improve the intelligent level of the product's own operation, and further realize the development of automation. It mainly emphasizes the main six aspects of the content. Firstly, the packaged product is set as the input focus to ensure the input of the automation target and the sequence of the input content, so as to achieve the target process. Secondly, the weight and weighing of the product are strictly controlled, so that the product that does not meet the requirements can be automatically cleared. Thirdly, realize the operation of the monitoring equipment, and improve the comprehensiveness. Fourthly, realize the effective control of the relevant working parameters, detect the problems and effectively grasp the function of automatic alarm. Fifthly, form automatic supervision to realize online supervision of drugs. Sixth, it can realize the collection of specific data and related development trends, and improve the comprehensiveness of data collection, improve the efficiency of packaging, so as to effectively control the labor cost, and effectively improve the economic benefits of manufacturing enterprises.

4.4 Intelligent storage management

The application of intelligent technology to the storage management of products can improve the intelligent development level of Chinese patent medicine manufacturing. With the continuous development of Chinese patent medicine manufacturing, the warehousing management process mainly includes five links, namely, warehousing, warehousing, inventory, and selection and distribution. The process contains a lot of content. If the whole process depends on manual operation and paper records, the efficiency of warehouse management will be very low, at the same time, it is easy to cause problems in manual operation, management mistakes, and requires a lot of manpower, which will increase the management cost of the enterprise. Therefore, under the continuous development of intelligent technology, enterprises can adopt advanced RFID technology, code the unused products to facilitate management. At the same time, network operation can be carried out to find the specific information of specific products, so as to realize the tracking and management of product information, and improve the monitoring ability of warehouse management and achieve the purpose of remote control. In the establishment of multiple warehouse management subsystems, it mainly includes four aspects. First, for the establishment of the warehouse subsystem, including the management of the warehouse list, barcode management, product standardization, location allocation and adjustment, etc., the specific warehousing situation can be confirmed, and the content of the documents can be managed. Second, the establishment of the storage management subsystem should include the storage list, picking list and delivery documents and other management contents. Third, the establishment of the data management subsystem should include the management content of the inventory and data. Fourth, for the establishment of the system management subsystem, it must be able to backup the database information, at the same time, the system communication and use should be managed. And the network system is used to realize the real-time supervision of the warehouse location.

4.5 Intelligent experimental management and control

In the development of intelligent Chinese patent medicine manufacturing, the development of intelligent technology can be used to realize the application of ^[4] to data storage and processing technologies. For experimental testing personnel, it is more convenient to use the system to query data information. The enterprise can form the final report by entering the results of the detection and analysis, query the equipment and improve the working status of the monitoring personnel by applying the data upload function, and can find the problems, and effective coordination and processing by using the intelligent experimental management and control system, so as to reduce the waste of resources. At the same time, it can also improve the efficiency of detection, reduce the cost input in the process, and then can effectively make up for the disadvantages of traditional methods.

5. Conclusion

To sum up, the intelligent development of Chinese patent medicine manufacturing is not only an

opportunity, but also a challenge for the Chinese patent medicine manufacturing industry. A clear division of the intelligent maturity grades and standards of Chinese patent medicine manufacturing is conducive to further taking effective measures to further enhance the level of its intelligent maturity, and then improve the value and practicability of the intelligent development of Chinese patent medicine manufacturing.

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