

Design of Electric Cable Manufacturing Enterprise Information System based on Workshop Process

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Abstract. With the development of information technology in China, Kingdee management system has won the majority market of small and medium-sized enterprises, but the management system software can only solve the financial, marketing, inventory and other records of general enterprises, lack of information technology for manufacturing process. To solve the problem, this paper proposes a logical design based on workshop process flow, analyzes the idea of workshop information, realizes the control of key processes in manufacturing industry, and improves efficiency and product quality.

1. Introduction

With the promotion of smart manufacturing 2025 plan in China, the previous labor management has increasingly become harder to meet the demands of small and medium-sized factories for improving production efficiency, clarifying enterprise assets, and improving the cooperation ability of various departments. The majority of small and medium-sized enterprises have more and more strong demands for information and automation of factory management. Therefore, many enterprise factory management software have been developed correspondingly, ranging from financial management to workshop production, from customer information to product details. Even though information management has been extended to every corner of production management, the production of each assembly line can still be known in detail without reaching the workshop. The production situation, no longer a large number of paper materials piled up and seriously affect the query efficiency, all the data and information are stored in the computer, which can be easily and quickly queried, so as to greatly improve the operation efficiency of each department, playing an irreplaceable role in promoting the development of enterprises, but how to get through the existing situation of factory information from sales and Finance, factory management, especially the small and medium-sized enterprises pay more attention to the production and manufacturing links. There are still some challenges in how to understand the production process, parts storage management, product progress and other aspects of clear feedback to the enterprise management. Consequently, this paper mainly takes a small and medium-sized communication production enterprise as an example to describe the management process based on the production workshop process, which is of great significance to the efficient management of raw materials, semi-finished products and finished products, improving the real-time data interaction between various processes.

2. Business process analysis

In order to improve the efficiency of workshop production management, the original handmade



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documents are converted into data streams which are generated in a computer and stored in a database to realize real-time sharing. In order to ensure the accuracy of the production process, barcode is adopted to manage the important parts. Barcode management contains five parts: core management, fiber core management, fiber distribution management, certificate printing, assembly process management. The functions are as the following: the core management mainly manages and records the operations of the original fiber in and out of the warehouse, the original fiber coloring, and the colored fiber in and out of the warehouse; the fiber distribution management mainly enables user to carry out the fiber lay-up operation in this module and the addition, deletion and modification of the fiber distribution table; the certificate printing mainly manages the coloring inspection and subsequent certificate printing functions; the process mainly includes all the work in the middle and later stages of the technological process, including the operation of tube bundling, inner sheath operation, outer sheath operation, casing operation and the final cable forming operation. Regarding this, on the basis of system requirements analysis, we design various entities that can meet the requirements, as well as the relationship between them, and put forward the foundation for the later logical structure design. The entities proposed according to the system include sales department, production workshop, warehouse, customer, qualified product, etc. and the entity relation of the system is shown in Figure 1:

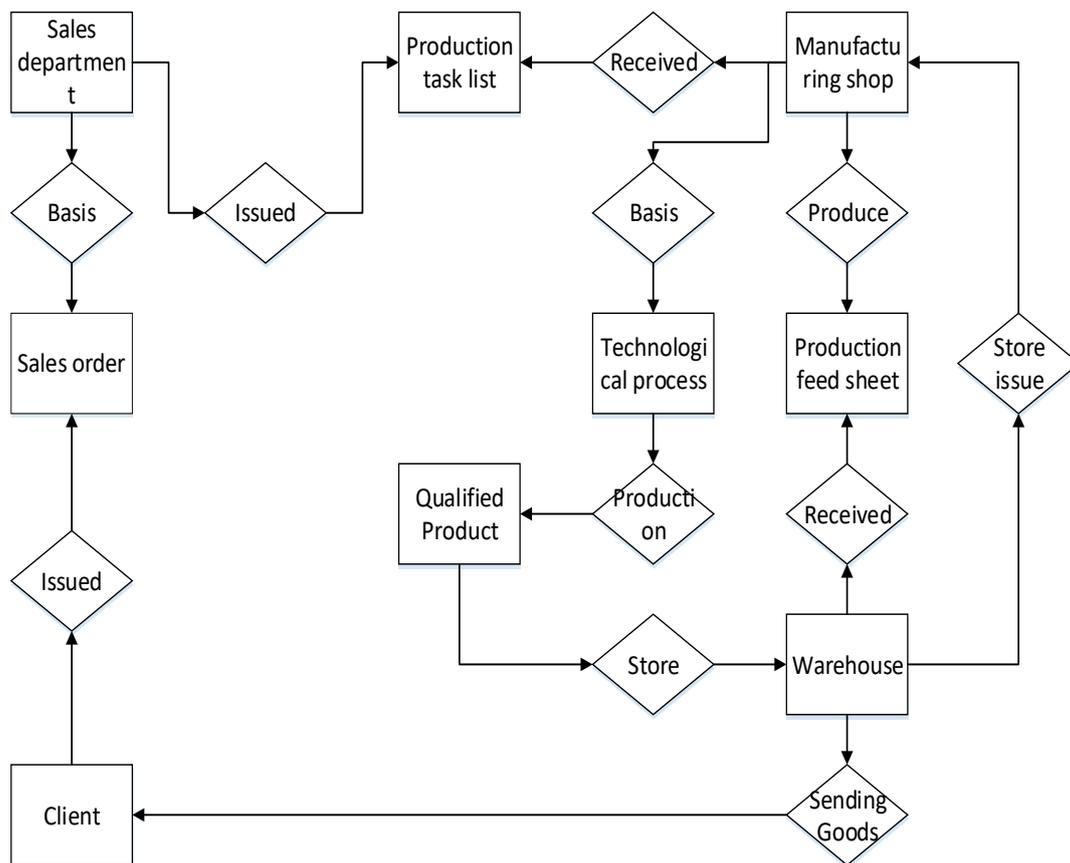


Figure 1 Business flow process

3. Business process of product manufacturing

The business process steps of manufacturing optical fiber in an optical fiber production enterprise are as follows:

- 1) Before put into storage, the original fiber needs to be inspected by the inspector and put into storage as qualified.
- 2) Coloring personnel may color all inspected original fibers.

3)The team leader of the fiber warehouse receives the production task list from the workshop director, splits the production task list into section lengths according to the customer's requirements, and then makes the fiber distribution table.

4)Judging whether the optical fiber needs to be combined according to the customer's requirements. If the optical fiber needs to be combined, take out the colored fiber according to the distribution table for the optical fiber belt distribution.

5) Carrying out the inspection on the optical fiber and the inspection center.

6) The personnel of fiber warehouse may make the tape matching table according to the production task list and carry out the tape matching work.

7) If it is not necessary to carry out fiber blending, the fiber warehouse personnel may carry out fiber blending according to the common fiber blending table.

8)The plastic sleeve personnel may lead the optical fiber or optical fiber belt to the fiber library for plastic sleeve work.

9)The distribution personnel may make the distribution table of optical cable according to the technical parameters.

10)If the central plastic tube type optical cable is used, after the panel matching operation, the panel matching personnel need to determine whether the cable needs to be completed. If so, follow the cable forming process, and if not, conduct sheath operation.

11)The cable forming personnel may take out the plastic pipe according to the distribution table, conduct the cable forming operation and the inspection center.

12)According to the order parameters, the layer stranding type and the central plastic pipe type need to be selected for internal protection, steel armor and external protection.

13)The personnel of the testing center may inspect the finished optical cable. If it is qualified, it should be put into the finished product warehouse. Otherwise, it may be reworked and repaired before the finished product is put into the warehouse.

14)Sales personnel issue according to the order.

The following diagram contains the overall business flow chart, as well as the flow chart of each process flow.

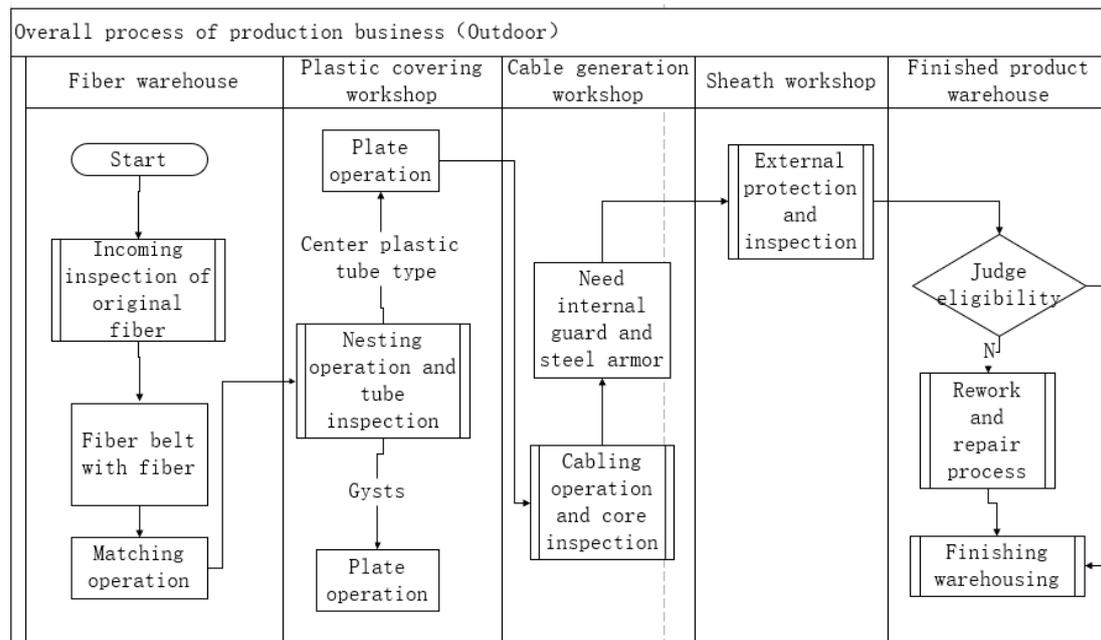


Figure 2. Data flow based on workshop

4. summary

This paper mainly introduces the design process of the ordinary small and medium-sized enterprises, and from the aspect of technological process to carry out the logical design of enterprise information. It is also necessary to ensure the correctness of the data entered before the system is enabled. The process flow module is mainly to carry out the production task management after the maintenance of the basic data, so as to strictly monitor every step of product production, and realize the information storage of product data. Inventory management is the most important module for the accounting system. Warehouse material counting can meet the material demand of production, and purchase order and inventory query need to be issued in the system. In inventory management, the production department enters and modifies the receipt / issue documents. The inventory accounting module is mainly used by the financial department to perform the accounting at the end of the month. Through the management of these modules, the production tasks can be monitored, the monthly production situation can be easily queried, the financial accounting at the end of the month can be done, and the corresponding vouchers can be completed.

Acknowledgments

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References

- [1]. Yun Zhi Li..Study on the Quantitative Vulnerability Model of Information System Based on Mathematical Modeling[J]. Techniques. Applied Mechanics and Materials,2014.
- [2]. Pei Feng Cheng, Qian Qian Zhao.VB on the Highway Pavement Performance Prediction and Optimization of Maintenance Programs. [J].Applied Mechanics and Materials,2011.
- [3]. Jian Ping Tan,Yun Long Liu,Heng Tuo Liu,et al.Study on Acceleration Control Algorithm of Blood Pump Driven by Large Gap Magnetic Force.[J].Advanced Materials Research,2011.
- [4]. Guo Ying Wang.Research on Designing the Information Management Platform of Physical Education Based on B/S Model.[J].Advanced Materials Research, 2014
- [5]. Juan Xi,Wei Li.Database System of Business Case Based on Network Perspective. [J]. Applied Mechanics and Materials, 2014.