Exploration on the Application of ERP and WMS Integration Technology in Engineering Enterprises

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Abstract. In order to realize the management goal of information resource sharing in manufacturing enterprises, ERP and WMS system integration is very important for the development of enterprises. Break the information island, realize inventory fine management, intelligent operation, reduce the dependence of manual experience. Although engineering enterprises attach great importance to the integration application of the two systems, but in the practical application process, the shortage of talents, the understanding is not in place and other problems, hinder the integration efficiency of ERP into WMS.

Keywords: engineering enterprise · ERP · WMS · Application problems · measure

1 Introduction

Engineering enterprises play an important role in the national economy. The increasingly fierce competitive environment puts forward new requirements for enterprises. How to take the lead in the development of the industry has become the focus of many enterprises ' thinking. In the environment of intelligent manufacturing, the application of an ERP/WMS system is indispensable. The seamless integration of the two systems can help enterprises integrate all aspects of production, manufacturing, warehousing, etc., so that internal documents can be coordinated and transparent so as to realize the lean management of internal control and improve the economic benefits of enterprises. ERP and WMS integration technology, WMS system uses bar code, mobile Internet and other technologies to establish an accurate and efficient warehouse logistics management business platform and combines the requirements of lean management solutions to comprehensively control and manage the warehousing, outbound, mobile, inventory, ingredients, picking, shipping, distribution and other operations of materials. At the same time, it integrates the existing ERP system of the enterprise to ensure that the storage accounts are consistent, provides real-time, accurate and transparent material basic data support for the overall production and operation management of the enterprise, realizes

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the visual management of the warehouse data, accelerates the material flow, reduces the inventory backlog, improves the management level of the logistics organization inside and outside the factory, and provides new opportunities for the development of the enterprise.

2 Brief Introduction of ERP and WMS System

WMS: Warehouse Management System is a warehouse management system. It is a management system that uses mobile Internet technology to comprehensively use batch management, material correspondence, inventory, quality inspection management, and receipt management through functions such as warehousing business, outbound business, warehouse allocation and distribution management. It effectively controls and tracks the whole process of logistics management of warehouse business and realizes or improves the warehouse information management of enterprises. The system can perform inventory operations independently and can also be used in combination with the documents of the ERP system to effectively control and track the logistics of the warehouse and achieve perfect enterprise warehouse information management. The main business function modules of the system: receiving management, warehousing management, outbound management, inventory management, distribution management, report management, and basic data management.

ERP (Enterprise Resource Planning) is a kind of enterprise information management system that is mainly oriented to the integrated management of material resources, capital resources and information resources in the manufacturing industry. The commonly used modules of ERP include the BOM module, procurement module, inventory module, customer module, financial module and production module. The data between each module is transmitted to each other so as to arrange the production, procurement, sales and other activities of the enterprise.

3 Importance of ERP and WMS System Integration

Because ERP and WMS are two independent systems, data information cannot be transmitted to each other. ERP is a result of the operation of the system, can not control the implementation process of warehousing, and ERP has no bar code function; a lot of experience needs to be tested by manual judgment, and there is no fixed and transferable work experience. In order to improve work efficiency, ERP and WMS system integration is imperative. After the integration of the two systems, the specific process of material orders after the receipt of supplier orders in ERP-WMS system quality inspection-inventory storage-feedback to ERP system inventory module-financial settlement in ERP system. There are the following advantages:

3.1 Achieve Effective Internal Control, with Traceability

In the ERP system and WMS system, the job responsibilities of operators in different positions can be defined by setting operation rights, query rights and approval rights

so as to realize different job rights. There are multiple business flows in both systems. Which link is wrong, and the operator's account number is clear at a glance, which is retrospective, avoids shuffle and achieves the purpose of improving the responsibility of the staff.

3.2 Barcode, Materials, Receiving, Warehouse and Other Details of Management

Bar code management: through the implementation of bar code applications such as purchasing materials and warehousing documents, the transparent management of purchasing materials in the factory logistics process is realized to ensure the accuracy and real-time tracking of materials. Material management: Integrate the basic material data of ERP system and establish a real-time refresh mechanism. According to the material category, batch management is enabled to realize the first in, first out, accurate tracking and traceability management of warehouse materials. Receiving management: In the ERP system, the purchase order is obtained and released to the supplier through the system, and a business platform for real-time communication with the supplier is established to monitor the procurement and supply status in real-time, and the abnormal situation is solved in time. Warehouse management: integrated ERP system, with the help of material bar code, to achieve the material of the scan code outbound and inbound business operations while supporting the transfer, transfer, inventory and other needs to solve the manual inbound and outbound inefficient, error-prone issues, greatly improving the efficiency and accuracy of warehouse data. Distribution management: Based on the daily assembly plan of the assembly workshop (calling the vehicle BOM in the integrated ERP system), the material distribution plan is generated, and the warehouse operation is driven by the distribution plan. According to the distribution requirements of the production line, the picking, distribution and reception of materials are realized, and the timeliness of material distribution and transfer between warehouse and workshop is solved.

4 The Specific Application of ERP and WMS System Integration in Engineering Enterprises

4.1 Production Planning Stage

Production planning is a very important part of the enterprise production module. Accurate production planning is very important for the orderly development of production. Manufacturing enterprises use the WMS system in the production planning stage, which can not only realize the electronic management of monthly plans and daily assembly plans but also query the reasons for the change of plan. It can also provide the complete set of material analyses (material occupation information, material inventory information, material procurement in-transit information) to ensure the orderly development of production.

4.2 Acquisition Phase

In general, the larger the scale of enterprise production, the more types and quantities of materials used in the production process, such as product parts (self-made parts, purchased parts), raw materials, accessories, etc. Once there is a shortage of material supply, it not only affects work efficiency but also seriously affects the timely delivery of products once the material supply with a long supply cycle is insufficient. The procurement phase uses ERP and WMS system integration. The purchaser creates an order in the ERP system. Through the integrated interface, the purchaser obtains the created purchase order in the WMS system. After the purchase order is released through the WMS system, the supplier can log in to the system to view and receive its own purchase order. Then purchase order execution and material receiving. The use of two systems can realize the automatic replenishment warning of safety inventory and ensure that the information can be transmitted to the purchasing personnel in time. Through the system, the procurement demand calculation is automatically carried out, the procurement efficiency and the accuracy of procurement data are improved, and the data analysis can be carried out to quickly correct the error of material supply.

4.3 Quality Inspection Stage

Quality inspection is an indispensable work of quality management. It carries out comprehensive and standardized management of the incoming inspection business of materials, covering the functions of the inspection base database, inspection tasks, unqualified processing flow and so on. Through purchasing the quality section, the quality personnel cooperate with the mobile terminal to carry out daily external inspection work, realize online processing and networked collaborative office, and improve the reporting and processing efficiency of quality problems.

4.4 Warehouse Management Stage

Warehouse management mainly includes the warehousing process, return process, outbound process, inventory allocation, inventory and other processes. Through the data-driven business, the data flow is transmitted in real-time in the system, the accurate binding relationship between the material and the storage location is realized, the material position is grasped in real-time, and the material batch is managed to ensure first in first out, refine the material tracking node and assist management. Subject category synchronization management, according to the subject category table provided to make the material application business adjustment, WMS synchronization ERP material subject information.

Using integrated systems and inventory control to reduce material inventory backlog, improve inventory turnover, reduce inventory costs, and bring benefits to enterprises. Enterprises use ERP systems to supervise inventory. All kinds of data are fed back in the form of reports. Through the analysis of various data, it provides a reliable quantitative basis for the business decision-making of enterprises.

4.5 Financial Stage

The financial module in the ERP system can be integrated with the production planning module and inventory module of the WMS system, which greatly improves the data flow information. It can not only automatically transmit the data information of the procurement module to the financial module system but also arrange the enterprise operation according to the content of procurement and production and improve the profitability of the enterprise. The financial module in the ERP system mainly includes a receivable module, payable module, asset module, cost module and general ledger module, which can provide accurate and real data reports for enterprises, improve the level of enterprise cost management, and provide data support for enterprise performance evaluation.

5 The Main Problems Existing in the Integration of ERP and MWS System in Engineering Enterprises

5.1 Incomplete Understanding of the Importance of ERP and WMS System Integration

The application of an ERP system in many large manufacturing enterprises is gradually maturing, and ERP operators are becoming more and more skilled. Most enterprises do not realize the impact of ERP system defects on enterprise development from top to bottom. For example, in terms of warehouse management: an ERP system is more like financial management software; for the warehouse site, operation process control is not specific. The WMS system can not only make up for the shortcomings of ERP system inventory management but also automatically collect data and update it to the background of the system so that the inventory data can be dynamically updated in real-time. Through bar code and batch management, strict control and traceability of goods in the library can be realized. The integration of the ERP system and WMS system can not only give full play to their respective advantages but also make the data of the ERP system more timely and effective, work more efficiently, and promote the process of enterprise industry 4.0 construction.

5.2 Lack of Professionals, Over-Reliance on Suppliers

The normal operation of the two systems requires strong working ability and experienced technical personnel to maintain and operate. Due to the loss of talent in the enterprise, the existing personnel does not have a comprehensive understanding of the logic of the ERP and WNS systems, and the system errors cannot be analyzed and solved in time. This not only does not reflect the value of the two systems in the development of the enterprise but also reduces the cost and increases the efficiency. To a certain extent, it will also cause cumbersome work procedures and a waste of resources.

6 Improvement Action

6.1 Do the Basic Work Related to the System Well

On the one hand, enterprises should organize professionals to investigate ERP and WMS system suppliers, communicate closely with large experienced suppliers, fully understand the functions of the system, and determine whether it can meet the needs of the current and future development of enterprises in the next five years, whether the system has stability and other key information, and choose suppliers with a good reputation in the industry. On the other hand, the management does a good job in the publicity of ERP and WMS integration, emphasizes the necessity and importance, drives all departments to attach importance to the role of system integration in the development of enterprises, organizes professional and technical personnel to boldly put forward business needs, and focuses on the discussion of the existing business flow of the enterprise to form a practical business process.

6.2 Organize Irregular Training for Personnel and Guarantee Training Hours

First, enterprises do not regularly invite supplier consultants to enter the enterprise, carry out professional training in modules, effectively improve the overall cognitive level of professional and technical personnel on the system, master the operation methods and system logic of the two systems, and provide high-level talent guarantee for the smooth operation of ERP and WMS systems.

6.3 Establish an Optimized Reward and Punishment System

In order to make the system rooted in the enterprise, the establishment of incentive mechanism and supervision system construction, in order to fully mobilize the subjective initiative of the personnel of all departments of the enterprise, outstanding work performance in a timely manner to reward, work progress obvious timely to encourage, only to mobilize everyone's subjective initiative, the enterprise can tell the operation.

7 Conclusions

With the increasingly fierce competition in the world economy, more and more engineering enterprises attach importance to the integration of ERP and WMS systems, which has long-term significance for promoting their own long-term development. However, due to the internal and external influence of the enterprise, the function of the two-system integration is hindered. Therefore, enterprises should do a good job in infrastructure construction, such as the Internet and computers, and promote the system integration system to take root in enterprises based on their own business processes and development. In addition, manufacturing enterprises should increase publicity, regularly carry out training, establish and improve the ERP application system, and strengthen the supervision and management of system applications so as to realize the effective integration of data information resources and improve the sustainable development of manufacturing enterprises.

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