An analysis of optimization strategies of intra-logistics systems in production enterprises

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Abstract: The development of China's economy and the globalization of manufacturing industry have witnessed China's edges in production and manufacturing gradually weakens. The current management concept and system fails to fully accommodate the needs of the current development and market changes. In other words, it is difficult for enterprises to control the cost in the course of production and operation; rather, it plays the counterproductive role. In terms of production enterprises, the most prominent issue is intra-logistics, which is directly related to various factors such as production efficiency and costs. As such, this paper analyses the optimization strategy of the internal logistics system of production enterprises.

1. Factors Influencing the Intra-Company Logistics Systems

As far as the current development of all types of enterprises in China is concerned, whether they are production enterprises or process-based enterprises, the requirements for the intra-company logistics systems are constantly changing with the development of the logistics industry in China. In regard of the production enterprises in the new era, the improvement of intra-company logistics systems will not only greatly enhance the production efficiency of enterprises; more importantly, it will play a decisive role in enhancing the core competence of enterprises [1].

Production logistics management is a vital part of the entire supply chain in terms of the whole production system of an enterprise. In particular, it plays a critical role in the overall operation when it comes to optimizing the allocation of resources. For that matter, it will achieve the ultimate goal of optimizing the internal resources of the enterprise on the basis of the integration between resources and the internal capabilities of the enterprise. It will produce high quality products that meet all standards in a short time and at low production and operating costs. On top of that, it will meet the needs of its customers with a fast response and adaptability, constantly improving the variety, quantity and delivery of its products. In the operation of production enterprises, the main factors affecting the intra-company logistics system are as follows [2].

1.1 Type of Production

The core competence of a production enterprise needs to be strengthened to survive and grow in a highly competitive market. And the type of production features in the core competence.

As different production enterprises go, the type of production they choose varies. For this reason, the product variety and structure of different production enterprises differ from each other. Moreover, we see the differences in the complexity of the production process, the classification of the product's precision, the process requirements, and the choice of raw materials [3]. As a result of these differences, the choice of intra-logistics composition and the proportional relationship between production operations varies from one to another.

1.2 Production Size of the Production Enterprise

The size of production is instrumental to the intra-logistics building in production enterprises.

The size of production means the number of products produced in a given unit of time. Therefore, in the actual production process, the larger the production scale, the higher the requirements for equipment and personnel in the production process, the more complete of the production process and the higher the material flows are required. And vice versa, the smaller the production scale, the smaller the components and material flows are required.

1.3 Professionalism and Personnel Collaboration within the Production Enterprises

Technological developments and innovations are constantly mounting the professionalism of the company's production capacity and the collaboration of its employees [4]. If its internal production processes are simple, then its intra-logistics processes can be somewhat compressed. For example, semi-finished products for the basic process stages involved in the production process can be sourced from external companies.

2. China's Current Requirements for Logistics Management in Manufacturing Enterprises

In the process of production and operation, in order to maintain stable production and smooth coordination, enterprises will strive to reduce product consumption on the basis of improving product quality, thereby achieving the goal of low-cost, low-consumption and laying the foundation for sustainable development. As a result, production enterprises need to meet the following requirements in logistics management.

First and foremost is the continuity of production.

Continuous production means ensuring that the production process is uninterrupted in accordance with the company's inherent production process, thus maximizing the use of the company's resources.

Second, the ability to match the productivity of the production enterprises

The various production stages and processes involved in the production process of a manufacturing enterprise are required to maintain a certain proportional relationship between their production capacity within a reasonable range and on the basis of scientific production operations, so as to seek a certain balance in the production process. When there is an imbalance in the production capacity, measures need to be taken to adjust or coordinate.

Third is balanced production.

Rational production, reduction of goods in stock and facilitation of the capital circulation are the top priorities of business operations. Balanced production, on the other hand, for a production enterprise is the precise calculation of the operation of each stage so as to ensure that the same amount of output, or progressively increasing amounts of product, is produced in each stage of the production process. By doing so, various working links is maintained stable or maintained in a relatively stable state.

Fourth, balance in the production process.

On the basis of making full use of the equipment, the labor productivity is greatly increased to create greater production benefits for the enterprise. The intra-logistics management in production enterprises should not only start with standardizing the basic production management data of the enterprise, but also establish and improve the internal production and logistics system, as well as optimize its indicator system of the enterprise. The company's basic data is used as the basis for the development of an exclusive and rational production and management plan that is in line with the company's internal reality. Both production and logistics are controlled in the process of optimizing the planning of production operations. Furthermore, within reasonable limits, the quantity of products and in-plant transport within the company is managed and controlled to improve intra-logistics.

3. Analysis of the Current Situation of Intra-Logistics in Chinese Production Enterprises

As far as the current development in China is concerned, there is a certain lag in the intra-logistics system and related technologies of production enterprises compared to that of the

foreign developing countries, mainly in the following aspects.

3.1 Facility Layout

In regard of production enterprises, the rationalization of the facility layout is directly related to their productivity. From an overall layout perspective, the layout of the process facilities needs to take into account not only the ease of the process, but more importantly, the process facilities, the rationality of the boundaries between departments, employees and other factors involved in the production operation of the enterprise.

The common facility layout problems in most Chinese manufacturing companies today are mainly focused on the site, where cross-logistics are too severe. This significantly raises production costs and results in inefficient use of resources. For that matter, it increases the complexity of the production process and its logistics costs. However, if the facilities are laid out properly, not only can the profitability of the enterprise be improved, but more importantly, it can regulate the rationality of the transport routes during the operation of the enterprise. And on the basis of satisfying the rationality of the production process, a rational layout not only shortens the time as well as the consumption of internal logistics, but also greatly increases the flexibility of internal logistics.

Companies have to respond quickly to the needs of the market and their customers in a short period of time in the process of development. The development potential in the production process can be greatly increased in a rational and efficient working environment. For a production enterprise in particular, the pursuit of production is just one objective; it is more important to rely on production for development and efficiency. Therefore, a rational layout will provide a right space for the development of the enterprise and play an important role in improving the overall logistics.

3.2 Production Logistics Management

From a production logistics management point of view, the execution rate of data and planned forecast information from production logistics planning systems is relatively low. Enterprise production planning is the basis of enterprise production and operation, and also the core content of production logistics management. Under the guidance of the company's production planning strategy, the production tasks are determined on the basis of production forecasts and optimization decisions, and a comprehensive balance is struck between work tasks and various repetitive production factors. Production tasks are arranged in time and space, and then further broken down into workshop tasks and shift tasks to ensure the execution of project tasks at every level.

A scientific production plan has to be drawn up. In addition to mastering national macroeconomic policies and the business environment, enterprises should make greater use of basic information related to production activities, such as production process capabilities, process operational efficiency and productivity, product output, major fuel and energy consumption, and by-product quantities. Adequate and accurate information is the basis for production planning. It is therefore necessary to have a good production plan in place before all information can be collected and collated.

Zero inventory is currently the ultimate goal of inventory management pursued by modern companies. The aim of inventory management is to lay the foundations for sustainable development while meeting the needs of customers. This leads to a reduction in stock and an increase in the efficiency of intra-logistics, thus strengthening the core competence of the company. However, it is noted to prevent incidents such as supply shortages and late deliveries that affect the business reputation in the course of production and operation. The ultimate aim of optimizing the intra-logistics system is to maintain stable and sustainable production and to achieve greater flexibility in the supply of goods within the production company. And while adapting to changes in the market as well as in customer demand, enterprises seek to survive and develop.

In terms of production scheduling, the scheduling organization is relatively bloated, the scheduling methods are relatively outdated and the information feedback is not immediate enough. When it comes to process capacity matching, most of the production enterprises have serious mismatch of various process capacities, either insufficient capacity or overcapacity. As for the construction of

information systems, most Chinese enterprises are trailing behind in terms of overall information systems. The phenomenon of internal information silos within enterprises is serious.

Logistics and information are inseparable. To be more specific, logistics is the carrier of the information flow while the information flow reflects the content. As such, the basic requirement of modern enterprise production and logistics management is to tap network-based information technology to build an enterprise information platform for transparent, timely information transfer and data exchange in the field of logistics.

4. Analysis of Strategies to Optimize the Integration of Intra-Logistics in Production Enterprises

According to the current production logistics in some Chinese enterprises, the core of logistics integration and optimization is how to rationalize the allocation of resources from the global level of the entire production system so as to achieve balanced production, inventory reduction, timely delivery and cost reduction.

The main issues to be addressed for production enterprises in the process of intra-logistics integration and optimization are as follows: optimize the production planning to the production process and strengthen the control in the production logistics process, thus indirectly solving the prevailing production planning priority, lack of logistics tracking and untimely production scheduling in production enterprises.

In terms of current production logistics control, the main tendency is to control the production plan as well as the raw materials, semi-finished products and goods in stock, which covers the management of the human and material resources of the enterprise. In the actual management process, especially for production companies, it is necessary to have a real-time overview of the dynamic and static situation in the factory so that managers can make timely and accurate decisions. In this way, while ensuring the quality of the product, production can be increased, deliveries can be made on time and customer needs can be met to the best.

When it comes to the optimization strategy of the intra-logistics system of a production company, production planning optimization is the basis, logistics tracking and rational scheduling is the means, and accurate and real-time information is the guarantee. Logistics tracking from raw materials to finished products, dynamic collection and recording of production, storage and transport processes, real-time data to control the flow and changes in production logistics. Logistics tracking and production logistics control are the basis for controlled production and logistics. Adopt methods and principles of actual inventory management to establish an integrated management system for material supply. Through rebuilding business process, improving logistics management system, establishing an independent professional logistics management department and standardizing the management of the entire production logistics process, it will not only solve the bloating of the dispatching staff, but also accelerate the pace of enterprise information construction as well as establish a logistics management information system for the enterprise.

5. Conclusion

As far as a production enterprise is concerned, the development of an intra-logistics system takes into account the company's basic data and the relevant information that has been forecast. The production plan and the logistics system are closely related and complementary to each other. The intra-logistics of a production enterprise is directly related to the profitability and the efficiency of its production. It is therefore crucial to optimize the intra-logistics of the enterprise; more importantly, it is a top priority in the production and operation process.

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