REGULATION OF LOGISTICS OF INFORMATION AND MATERIAL FLOWS IN DISTRIBUTED TRANSPORT SYSTEMS

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ABSTRACT

System analysis indicates that the implementation of logistics processes and operations needs centralized management, and management in periodic optimization under changing conditions of the enterprise or the environment.

Keywords: logistics, means of transport, computer systems, management system.

INTRODUCTION

To optimize logistics management, it is advisable to provide for the integration of:- planning logistics operations with planning the activities of the entire enterprise;

- logistics operations with other operations carried out by the enterprise;

- information technology used in the field of logistics, with information technology of the entire enterprise;

- information technology with partner companies.

The priority tasks of optimizing logistics management are control, analysis and reduction of distribution costs, including:

- the cost of transportation by various means of transport;

- the cost of loading from senders, unloading from recipients and possible transhipments along the route;

- storage costs that are directly related to transportation in connection with the transshipment, assembly or processing of cargo along the line;

- the costs associated with finding the goods and goods in transit, their unproductive storage in the delivery process (interest on capital, damage, loss, theft of goods);

- the costs of the formation and maintenance of stocks at trade intermediary companies;

- “deficit costs” associated with a shortage at certain points in some parts of the distribution network of certain goods, with inability to manage stocks, with crisis phenomena in the economy;

- expenses for packaging, labeling, documentation;

- expenses for cargo insurance, freight forwarding operations, icebreaking assistance, freight charges;

- labor costs for the amount of goods received per shift, etc .;

- administrative expenses and some other types of costs.

Quality control of the organization of unloading and acceptance:

- assessment of accuracy and accuracy in the performance of operations;

- assessment of the nature and typicality of errors in work.

MAIN PART

The acceleration of the movement of goods flows in the warehouse is determined by the acceleration of the processing of goods and documents at all technological stages. For example, they try to “straighten” the ways of moving goods in the horizontal and vertical directions - this reduces the time of movement.

Administrators and managers provide operational regulation of all operations - unloading, registration of receiving documents. Technological maps - a detailed description of the sequence and methods of performing operations and a list of documents drawn up in the course of work on the basis of relevant instructions and

regulatory documents. They are intended for the efficient use of labor and labor, eliminating errors in operations. Technological processes need to be clearly organized - they plan the timing and volume of receipt and dispensing of goods, the use of working time, storage space and funds. Schedules of loading and unloading mechanisms, schedules for the arrival of goods, schedules for expedition work, etc., help to plan the loading of people and operations during certain periods. Network planning using network models and graphs, which are a graphical sequential image of operations with calculated parameters and deadlines, helps to link the pace of execution of many operations to obtain the desired result in the desired time - for example, selecting and packing a large batch of goods for loading a whole train.

The terms of the movement of goods and workflow are proportional to the number of stock items in the inventory and the number of accounting transactions between different structural units that are necessary to track the movement of goods and the preparation of the necessary documentation. Logistics audit, process modeling, business process reengineering, staff training, lean technologies, process standardization, scheduling, technological maps, network schedules, operational planning, as well as technical means: computer systems, systems are used as means of optimizing technological processes in warehouses. radio communications, in-store television and other office equipment.

In the process of conducting a logistics audit, a model for assessing uncertainties in the supply chain of goods is used. Analysis of the three sources of uncertainty allows you to accurately determine the direction of optimization of logistics.

Uncertainties in the supply system. Problems in this area usually arise due to the irregular work of suppliers or due to the inability of the company to effectively plan orders for goods. The analysis includes verification of all stages of delivery - from filling out applications for spare parts to suppliers to placing goods in a warehouse.

Uncertainties in the sales support system. The sales support system analyzes how well customers' requirements are met: speed of order execution for goods, availability of the necessary stock of goods to fulfill customer requests, timely delivery of goods from the main warehouse, etc.

Uncertainties in the logistics management system. Diagnostics of the enterprise’s ability to manage inventory, modify supply plans in accordance with applications, and effectively work with suppliers is carried out. The time spent on the execution of customer orders and delivery of goods to the point of sale is analyzed.

Information flows are the nervous system of the economy. Without communication, the material flow cannot be established. The flows of information materials do not have to be identical in content, in time. Distinguish between leading and related information and its systems. The leading data flow is initiated by the customer in the direction of the supplier, and the supporting flow goes in the opposite direction. Using leading information, they try to avoid the accumulation of materials in unintended places or unprofitable reserves. The use of a single information standard in the logistics chain can reduce the cost of collecting information and subsequent complaints. The implementation of measures to accelerate and improve the information flow gives a gain not only to the supplier and customer, but also to the logistics company. A noticeable increase in the speed of movement of goods in distribution channels is achieved through the use of electronic data exchange in real time. Such an exchange involves computer communications (direct or via the Internet) between channel members - manufacturers, distributors, dealers and service companies - banks, carriers, forwarding companies, insurance companies. Electronic exchange participants place or confirm orders, pay for deliveries, order vehicles, exchange information regarding customers, goods in transit, financing, payments, insurance, etc.

Information exchange allows partners to act quickly and in a coordinated manner, information is used to reduce costs and improve client service.

Information flows during the movement of goods include:

- orders, order confirmations, contracts, claims, correspondence;
- warehouse and forwarding documents;
- shipping documents (shipping specifications, packing lists, certificates of conformity, certificates of origin of goods, etc.);
- transport documents;
- insurance documents;
- customs documents;
- transit documents;
- sanitary and other permits;
- port documents, bills of lading, charters, airborne documents;
- settlement, payment, credit documents, guarantees;
- notifications of shipments, transshipments, cargo arrival, payment, etc.

Today, everyone understands that only with the help of well-established information can competitive advantages be achieved. Without modern hardware and software, it is impossible to achieve compliance with information requirements such as its relevance, speed, coverage of a fairly wide array of data and their reliability, as well as cost reduction. The costs of collecting and processing information should be in a certain proportion with the benefits received from it. Standardization of information and the components of the process steps is required. In the world of information, this means, first and foremost, the establishment of common concepts and organizational structures. It requires synchronization of material and information flows using standardized appropriate interfaces.

The points of contact between information and material flows constantly occur, because when moving material flows you have to collect data from various invoices, read them using a bar code or transmit them using electronic telecommunications. When processing information related to the movement of materials, their identification is crucial. It is not allowed to enter data into a computer in the absence of a material identification catalog. The minimum standard of information for each movement should include, along with the part number, the date, quantity and address data of the supplier and client, as well as under certain conditions and indications of a forwarder or an external service institution.

The loader management system receives order data for creating transport tasks from a higher-level system (warehouse management system). It processes this data and sends it to the loaders in an optimized way (using a number of criteria). This takes into account the priorities of movements, as well as the type of load, means of transportation of cargo, type of loader and the permitted area of movement of individual loaders.

The priority of transport tasks is calculated dynamically in accordance with the principles of fuzzy logic, taking into account data received from the user, warehouse topology and system parameters. The priority level controls the sequence of transport tasks. Since information about all movements is transferred to the warehouse management system (central system), data on inventories always correspond to the real situation.

Application of the system provides significant advantages in the management of warehouse flows:

- minimization of errors through the use of check digits and operational checks;
- direct connection between material and information flows (operational registration of movements);
- a clear distribution of tasks for individual loaders;

- route optimization;
- double cycles;
- quick replenishment of stocks at picking places;
- management of priority levels and tight response times;
- transparency of stock reporting;
- effective working methods and cost reduction.

In practice, the optimization of order management processes using the system leads to a significant increase in productivity at warehouse complexes. According to information received from customers, the number of errors in the picking process is reduced from 2-3% to 0.2-0.3%. In other words, labor productivity when picking orders grows by 20% and the percentage of errors decreases by the same amount.

After distributing loaders and workers with terminals to various storage areas and job types, the system prioritizes transport tasks in accordance with the following four criteria: Empty run between two loads. The system optimizes the runs by minimizing the time spent moving empty, optimization with a double cycle. Using the previously entered distance matrix, upon completion of the transport task, the system searches for the next task, the starting point of which is located next to the end point of the previous task.Waiting time. Waiting times are taken into account in order to enable remote load modules. Over time, the priority level of such cargo modules increases. Priority levels are assigned to specific types of tasks (goods receipt, goods release, redistribution, etc.). So, for example, replenishment may receive a higher priority than other types of tasks, so that replenishment tasks for picking places are always processed first.

The priority of the transport task was obtained from the warehouse management system. Using transport tasks, the warehouse management system can transfer priorities to the loader management system. This function allows the user to transfer urgent tasks from the warehouse management system to the job bank of the loader management system so that immediate action is taken on these tasks.

CONCLUSION

The overall dynamic priority of a job is a combination of all the criteria mentioned. This is a decisive factor in the distribution of transport tasks. Each of the criteria described above has a specific weight, which is set when configuring the system. Due to this, precise tuning of optimization processes is achieved in accordance with specific conditions and with the current situation.

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