Seminar 13

Topic: Information logistics.

Ways to automate logistics process management

Questions on the topic of the lesson:

1. Information technologies and information flows in logistics

2. Technical means of information support in logistics systems.

3. Information support in supply

4. Information support for inventory management

5. Information support during warehousing

6. Information support during transportation

Information technology in logistics

Delivery of goods in the areas of production and commodity circulation is associated with a constant exchange of information between participants in the logistics process.

At present, it is practically impossible to ensure timely delivery of goods without the use of information systems and special software. Therefore, information technologies are used for analysis, planning and support of commercial decision-making in logistics systems at the macro and micro levels.

In modern logistics, **information systems (IS)** are understood as a set of software and hardware tools and methods for producing, transmitting, processing and consuming information in systems that ensure the movement of material flows.

Information flows (IF) associated with the organization of production and distribution of goods can be divided into flows of an individual enterprise (micro level) and flows of interorganizational, regional and interstate levels (macro level).

The development of information support in logistics systems is associated with the growing role of information in the sphere of circulation of goods and services, as well as with the increase in the volume of information linked to material flows. Consequently, traditional methods no longer succeed in extracting the necessary information from the data flow. Therefore, technical and software tools are used to collect, process and analyze information in logistics systems.

Technical means of information support in logistics systems are:

✓ electronic computing equipment;

✓ personal computers; servers;

- ✓ peripheral equipment;
- ✓ means of communication;
- ✓ automated equipment.

tools **in logistics** include:
- ✓ general-purpose software (corporate enterprise management information system);
- ✓ office applications; database management systems (DBMS);
- ✓ other software;
- ✓ specialized software (components of corporate information systems (CIS) in the form of a Logistics module;
- ✓ independent software tools that implement individual logistics functions.

The use of information technologies in logistics systems is aimed at ensuring the movement of goods and interaction between divisions of the enterprise, as well as between enterprises in the process of supplying and selling goods.

Information support in the functional areas of logistics

Information flows permeate the spheres of production and commodity circulation. At the same time, logistics considers only those information flows that are related to material flows and stocks. These are accompanying documents, orders for goods, information on the movement of stocks in a warehouse or the movement of vehicles, etc.

Let's look at the information-rich areas of logistics - supply, inventory, warehouse and transport.

Supply. Information technologies in procurement are used to automate supply orders, negotiate and conclude contracts, which allows for a reduction in the logistics cycle time from the application to the receipt of goods at the enterprise warehouse.

A particular difficulty in supply is the preparation of accompanying documentation, so electronic data interchange (EDI) is used to automate supply operations. *For example, a company "connects" its information system with the supplier's system, and when the stock in the warehouse reaches a threshold value, a request is automatically sent to the supplier. This option is suitable for small regular orders.*

To improve interaction between suppliers and buyers, the electronic business system is currently used as the implementation of business processes in global computer networks. Electronic business is abbreviated as B2B. The main technologies of electronic business include: electronic commerce (B2C); electronic interaction with government organizations (B2G); electronic interaction with employees (B2E).

Electronic business is abbreviated as **B2B (Business-to-Business)** - "business for business". This is the organization of complex information and trade interaction between

companies through electronic communications (Internet, intranet, mobile and other means of communication).

The main technologies of electronic business also include:

- **B2C (Business-to-Customer)** — "business for the consumer". Electronic trade is conducted for ordinary end customers. Examples of B2C implementation are electronic stores, booking systems and ticket sales.

- **B2G (Business-to-Government)** — "sale from business to government". Electronic trade is conducted between trading companies and government agencies, which often make government purchases by posting them on specialized online services.

- **B2E (Business-to-Employee)** - "business-employee". Use of information technologies in the sphere of relations with personnel.

The main advantages of e-business are:

✓ instant access to suppliers located anywhere in the world;

✓ a transparent market in which goods are easily accessible and the conditions for obtaining them are acceptable;

✓ automation of procurement through standard procedures;

✓ saving time required to make a purchase;

✓ reduction of purchasing costs;

✓ possibility of using outsourcing.

Most software products that automate the supply of industrial enterprises contain the following functions: monitoring contractual relations with suppliers and carriers; control of obligations to pay for deliveries; generation of documents required for acceptance of goods in the warehouse; filing claims with the supplier; automation of all operations on the receipt, expenditure and internal movement of goods in the warehouse.

Supply is the initial part of the general material supply chain in the spheres of production and commodity circulation, therefore the work of the entire macrologistics system in the industry depends on the quality of supply (determination of material needs, selection of supplier, accuracy and timeliness of delivery, simplification and standardization of procedures for submitting and processing orders, etc.). The use of information technologies allows for timely delivery of quality goods and in the ordered quantity.

Inventory management. Inventories are present along the entire path of the material flow. By performing their functions, they ensure reliable operation of the logistics system at both the macro and micro levels. The main tasks of inventory management include analysis and optimization of inventory volumes and selection of locations for their placement.

To determine the level of stock in warehouses, a set of tools is used, including: specialized software; technical identification tools (scanners, readers); barcode or radio frequency coding technologies.

Inventory management software may have three modules: a forecast module; a supply module (current control of warehouse stocks and generation of requests based on the "order point"); a pricing module (price adjustment based on the compliance of the medium-term forecast of the current liquidity of stock balances and the supply situation).

Inventory management tasks with dependent demand are successfully solved by MRP (Material Recourse Planning) class software. Inventory management modules are also available in all ERP systems (Enterprise Resource Planning) - this is a comprehensive software for simplifying, automating and effectively managing business processes in an organization.

In most Western ERP systems, inventory management is implemented using SIC (statistical inventory control) technologies. **SIC (Statistical Inventory Control) technologies** use statistical methods to model demand and inventory replenishment time (for production stocks - taking into account the time for their production). With the help of SIC, a purchasing decision is made based on statistical observations of changes in stocks, which allows for a significant increase in the accuracy of forecasted sales volumes in the short term. They use statistical methods to model demand and inventory replenishment times (for manufacturing inventory, taking into account lead times).

In addition to inventory accounting, information technologies are used to analyze inventory status by implementing ABC and XYZ classification methods in software solutions, calculating seasonality coefficients, assessing the need for irregularly demanded goods, etc.

ABC analysis shows how profitable a product is. It divides the product range into three groups:

- A - leaders: 20% of products that bring 80% of profit;
- B - average: 30% of products that bring 15% of profit;
- C - Outsiders: the remaining 50% of goods, which make up 5% of profits.
- **XYZ analysis** divides products by sales regularity (**Group X** — stable products that are bought regularly in approximately equal volumes, **Group Y** — conditionally stable demand that changes, but not significantly, **Group Z** — unstable sales with sharp fluctuations). It helps to calculate how much product should be in stock so that it does not lie around and brings profit. This analysis requires statistics on product sales for several months.

ABC and XYZ analyses complement each other and provide a more complete picture.

ABC/XYZ analysis combines these two analyses. Objects are divided into nine groups instead of three:

- ✓ AX - large share of profit, stable demand.
- ✓ AY - high profit margin, fluctuating demand.
- ✓ AZ - high profit margin, unpredictable demand.
- ✓ BX - average profit volumes, stable demand.
- ✓ BY - average profit volumes, fluctuating demand.
- ✓ BZ - average profit volumes, unpredictable demand.
- ✓ CX - low profit, stable demand.
- ✓ CY - low profit, fluctuating demand.
- ✓ CZ - low profit, unpredictable demand.

This classification allows you to understand which products are the most valuable to the company and which ones are performing the worst.

In this case, specialized software is created or Excel is used. Internet technologies are currently gaining great importance in managing enterprise inventories.

Warehousing. Warehousing and processing of consignments of goods are important components of the activities of manufacturing and trading enterprises. Warehousing costs absorb from 12 to 40% of the enterprise's expenses for organizing the movement of material flows.

The transformation of material flows in a warehouse is associated with a change in the parameters of received and issued consignments of goods by the composition of cargo units and the time of their dispatch. In the end-to-end management of material flows in a warehouse, information technologies provide invaluable assistance, as they allow tracking all processes in the warehouse in real time. Such an operation as "Accounting for the movement of goods" is significantly simplified. Thanks to the use of the information system, it becomes possible to determine the presence or absence of stock for each product item in the warehouse at any time.

Transportation. Transport industry, in the broad sense of the term, is one of the logistics subsystems that ensures the movement of material flows between suppliers and consumers in macrologistics systems. In addition, non-public transport carries out the movement of components and materials within enterprises (micrologistics level). To improve the efficiency of transportation, appropriate information technologies are used.

On-board computers and tachographs are installed in motor transport , so electronic data exchange allows to significantly increase the information turnover, to refuse travel documents and thus to save significant financial resources. *With the help of these devices and navigation systems the route of movement of cars, the level of fuel consumption, travel time, etc. are tracked.*

Satellite navigation systems are used in intercontinental cargo transportation .

geographic information systems are used , which are widely used in route planning.

Thus, modern software and hardware are widely used throughout the world and are being introduced into the practice of domestic enterprises.

The use of information technologies is a necessary condition for the effective functioning of logistics systems. To implement information systems and technologies at an enterprise, it is necessary to reengineer the material flow management systems.

Thus:

1. **Logistics information** is purposefully collected information necessary to ensure the process of managing the enterprise's logistics system.

2. **A logistics information system** is a specifically organized set of interconnected computer technology tools, various reference books and necessary programming tools that ensures the solution of certain problems in managing the movement of material flows.

3. **The use of information technologies** is a necessary **condition for the effective functioning of logistics systems** . Information technologies are used for analysis, planning and support of commercial decision-making in logistics systems at the macro and micro levels.

4. **Information support of logistics at the enterprise is the activity of collecting, recording, processing and analyzing information, forecasting.** Information support is a tool for integrating elements of the logistics management system.

5. **The most information-rich functional areas** of logistics are supply, inventory, warehouse and transport.