

Seminar 3

Factors and trends in logistics development. Strategy and planning in logistics systems

Questions:

1. Paradigms of logistics. Types of paradigms (analytical, technological, marketing, integral) and their characteristics
2. Modern trends in logistics development
3. Basic principles of effective use of logistics
4. The concept of planning strategy in logistics. Types of strategic planning in logistics. Logistics control.
5. Types of logistics strategies.

1. Paradigms of logistics

The evolution of the logistics concept is closely related to the paradigms in logistics. Historically, four main paradigms have developed:

- analytical,
- technological (informational),
- marketing,
- integral.

Around these fundamental paradigms in the West, certain scientific schools, research groups and logistics communities have concentrated.

The analytical paradigm is the original classical approach to logistics as a theoretical science dealing with the problems of managing material flows in production and circulation. An example of the concentration of research around the analytical paradigm are American universities, where logistics is one of the fundamental disciplines. The analytical paradigm of logistics is based on a theoretical framework that uses methods and models of inventory management theory, operations research, economic cybernetics, methods of mathematical statistics, etc. in research. A characteristic feature of the application of the

analytical paradigm is the construction of a sufficiently complex economic and mathematical model reflecting the specifics of the logistics problem being solved. At the same time, the problem must be clearly defined, and the model must be feasible, which is quite difficult to achieve, given the complexity, large dimension and stochasticity of logistics objects (especially integrated logistics systems). In addition, the implementation of such models requires a huge array of initial information and the development of complex decision-making algorithms in logistics management. The above-mentioned features have led to the fact that the area of practical application of logistic models and tasks based on the analytical paradigm has been narrowed mainly to intra-production logistic systems. For most companies interested in an integrated approach to logistic research, the classical, analytical paradigm is of little use.

The technological paradigm is closely connected with the rapid development of information and computer technologies. The philosophy of this paradigm is that, on the one hand, it is possible to formulate the general problem of managing the material flow of a logistics facility, and on the other hand, to build information and computer support for solving the problem. The main emphasis of this paradigm is on the administrative functions of the company: planning, purchasing material resources, production, distribution of finished products, etc. Support for the overall process of managing the material flow is carried out using information and computer systems of accounting, communication (telecommunications), control and decision-making.

The theoretical basis of the technological paradigm is a systems approach, which is used both for modeling the logistics objects themselves and for building information and computer support systems. The main strategies of logistics management are to automate trivial tasks and use information and computer support to solve more complex logistics problems. At the same time, optimization of the material flow management process is not the goal within the framework of this paradigm. A practical example of the use of the technological paradigm are the widespread systems of planning of requirements/resources, applied in internal

planning and management of stocks and purchases of material resources, as well as deliveries of finished products to consumers. Along with this, individual optimization problems are solved, for example, determining the optimal delivery lot (order) or the level of product stocks in elements of logistics systems such as optimal production technologies.

At the same time, logistics systems built on the principles of using the technological paradigm do not have the necessary flexibility and dynamism required at the current stage of development of the market economy, for example, to regulate the relations of producers with suppliers and end consumers of products.

Since the early 1980s and up to the present time, a number of industrially developed Western countries have often used **the marketing paradigm when building corporate** logistics systems . Models using this paradigm are intended to describe and explain the relationship between the logistics system and the company's capabilities in the competitive struggle. The designed logistics system should implement the strategic goal of the company - the strategy of competition in the product sales market, which requires solving such marketing problems as market research, determining the competitive positions of the company, forecasting demand for products, etc. The scientific basis of this paradigm is mainly economic and social disciplines: economics and organization of production, strategy, operations management, personnel and product quality management, marketing, social psychology. The mathematical basis of the paradigm is probability theory, mathematical statistics, and operations research methods. It should be noted that the models of logistics objects using this paradigm are abstract to a certain extent and have a large dimension. Many variables in such models are qualitative in nature, making it difficult to obtain simple analytical solutions.

An example of the practical use of the marketing paradigm abroad is the LRP system (logistics requirements planning system) — a system for monitoring input, internal and output material flows at the level of a company, territorial production associations and macrologistics structures.

The LRP system is also known as the supply chain management system (supply chain management system). The LRP system provides: a conceptual marketing approach to inventory management in distribution networks and within production units of a facility; forecasting the need for material resources, demand for finished products and the need for vehicles; determining the optimal number of links in the logistics chain, etc. In practical tasks of building logistics systems, these three fundamental paradigms are usually combined.

At the same time, in recent years a new logistics paradigm has taken root in the West and is actively spreading, which most researchers call **integral**. This paradigm essentially develops the marketing one, taking into account the new prerequisites of business at the present stage, which we have already partially considered.

The main prerequisites of the integrated logistics paradigm are the following:

- there is a new understanding of the mechanisms of the market and logistics as a strategic element in the implementation of the competitive capabilities of the company;
- there are quite broad prospects for integration between logistics partners

This model represents the material flow as an integrator, where the integrating function can be spread across several firms, organizations, logistics intermediaries, generalized functions, computer information systems and financial institutions.

The only necessary condition is the interaction of the specified objects (elements of the integrated logistics system) either directly or indirectly with the controlled material flow - through information or financial flows. Thus, the logistics system, according to the new, integral paradigm, is considered as a single whole, as an integrated system that implements business goals in all its links - from the supplier to the end consumer (buyer). The integral paradigm reflects a new understanding of business, where individual firms, organizations, systems are considered as certain centers of logistics activity, directly or indirectly connected

in a single integral process of managing the material flow for the most complete satisfaction of customer requests in accordance with business goals.

The basis of such an integrated approach are: the concept of total quality management, Japanese product quality control systems, integrated product distribution systems, just-in-time concepts, and others.

The integrated paradigm was used, for example, to create a logistics system such as ISCIS (Integrated Supply Chain Information System) — an integrated information system servicing the logistics channel. The ISCIS system implements integral coordination of logistics systems and their links at the micro and macro levels, both for material and information flows, using the on mode line of message processing in telecommunication networks. The information support of the system is unified by the international standard ISO 9735 - EDIFACT.

Thus, in corporate logistics systems, the material flow is considered as an integrating factor that unites the entire life cycle of a product: from idea to design, then production, distribution, sales, after-sales service, after which the cycle is resumed in accordance with changing customer demands.

According to the new, integral paradigm, the definition of logistics is as follows: Logistics represents a common point of view: strategic, tactical, operational on the company and its business partners with the material flow as an integrator.

Summarizing the above, we can say that **logistics** is a meta -discipline, the object of research and optimization of which is the material flow. The new, integral paradigm represents a situational and combinational perspective in organizing business both at the intra-company (micro level) and at various macro levels, such as regional, international, etc.

The development of logistics, in addition to the desire of companies to reduce time and money costs associated with the movement of goods, has determined the following two factors: the complication of the system of market relations and increased requirements for the quality characteristics of the distribution process; the creation of flexible production systems.

The factors were accompanied by the following impacts: a transition from a seller's market to a buyer's market took place, accompanied by significant changes in production strategy and distribution systems. Previously, sales were adjusted to production, now production depends on demand; the quality of service has improved, order fulfillment time has decreased, and the delivery schedule has been met. Thus, the time factor, along with the price and quality of products, has come to determine the success of an enterprise in the modern market; sales problems have become more complex with a simultaneous increase in requirements for distribution quality. This has caused a similar reaction in manufacturing companies regarding their suppliers of raw materials and supplies.

As a result, a complex system of connections between market entities was formed, which required modification of the models of organization in the sphere of supply and sales; problems of optimal placement of warehouses, determination of the optimal size of a batch of goods, optimal schemes of transportation routes, etc. were solved; replacement of traditional conveyors with robots led to significant savings in human labor and creation of flexible production structures, which made work on manufacturing small batches of products profitable; transition from mass production to small-scale production with minimal costs increased flexibility and competitiveness; production in small batches entailed changes in the system of providing production with material resources and sales of finished products; there was no longer a need to have large warehouses and there was a need to transport products in small batches, but within stricter deadlines. Transportation costs were covered by reducing warehouse costs.

In addition to the above factors that directly determined the development of logistics, it is necessary to note the factors that contributed to the creation of opportunities for this:

- ✓ using systems theory and trade-offs to solve economic problems;
- ✓ acceleration of scientific and technological progress in communications, introduction into the business practices of companies of the latest generation of computers used in the field of goods distribution;

✓ unification of rules and regulations for the supply of goods in foreign economic activity, elimination of various types of import and export restrictions, standardization of technical parameters of transport routes, rolling stock and loading and unloading equipment in countries that have intensive international economic relations with each other.

2. Modern trends in logistics include the following:

1. Expanding the range of **logistics services offered** : deferment, which consists in the fact that almost finished products are transferred to the distribution system, while their modification or consideration of the latest consumer requirements is postponed until the very last possible moment, which significantly reduces the level of stocks;

✓ transshipment, the use of direct shipments, which reduces inventory and associated costs in distribution centers to zero;

✓ mass production of custom products, combining the benefits of mass production with the flexibility of custom (B2C) products;

✓ direct delivery via electronic data transmission networks, via courier services, express parcel delivery services;

✓ Vendor inventory management service, where suppliers manage both their own inventory and inventory stored downstream in the supply chain, reducing overall costs;

✓ synchronized movement of materials, in which information about the movement of material flows is communicated to all participants in the supply chain simultaneously, which allows for the prompt coordination of the movement of material resources.

2. **Outsourcing** is the transfer of control functions over the distribution of finished products from manufacturers to specialized firms. This allows them to use the greater experience of specialized logistics firms in the distribution of products, and to a greater extent to focus on their core business - production,

development and promotion of their products to the market, and, thirdly, to reduce their overhead costs.

3. **Reducing the number of suppliers and forming long-term cooperation with logistics companies** . In the past, companies had a large number of suppliers who competed with each other, which helped to conclude profitable deals. Nowadays, logistics companies are increasingly involved in the management of all processes in the supply chain, and client companies are increasingly familiarizing them with their long-term goals in order to jointly develop mutually acceptable solutions. Clients increasingly value their time and increasingly trust the logistics professionals with whom they cooperate, they strive to limit their number, but develop long-term cooperation with those they have chosen as partners.

4. **Improving logistics process management methods**. New logistics process management methods are being developed and existing ones are being improved, designed to solve known logistics goals: reducing warehouse stocks, promptly responding to changes in demand, reducing production costs, optimizing transport flows, coordinating the activities of all elements of logistics chains, etc.

2. **Basic principles of effective use of logistics:**

The principle of a systems approach . The approach to objects of research as systems is one of the main features of logistics. The maximum effect can be achieved only when the MP is optimized throughout the entire length from the primary source of raw materials to the end consumer, and not within a separate enterprise or division. At the same time, all links of the logistics chains must work as a single, well-coordinated mechanism. Therefore, they must be considered as a holistic system in order to coordinate the economic interests of its individual elements, technical issues, technological processes, etc.

The principle of total costs . One of the main tasks of logistics is to minimize total logistics costs throughout the entire logistics chain from the primary source of raw materials to the end consumer. A necessary condition for the effective solution of this problem is the ability to accurately measure logistics costs, but this is only possible if the system of accounting for production and

distribution costs allows for the allocation of logistics costs. Therefore, it is necessary to separately identify and analyze sales costs, determine the most significant costs, identify their interdependence, etc.

The principle of global optimization. In the process of optimization of the structure or management of a logistics system, it is necessary to coordinate the private goals of the functioning of individual elements of the system in order to achieve a global optimum.

The principle of logistics coordination and integration. In the process of logistics management, it is necessary to achieve coordinated, integral participation of all links of the logistics system or logistics chains from its beginning to the end in the management of all types of flows during the implementation of the target function.

The principle of development of logistics service. Compared to improving the quality of goods or releasing a new product, there is a much less expensive way to increase the competitiveness of an enterprise, namely: achieving a modern level of logistics service and its development (ensuring flexibility, reliability and high quality: timely delivery, convenient packaging, acceptable batches, selected assortment, etc.).

The principle of modeling and information and computer support. In the analysis, synthesis and optimization of objects and processes in LS, various models are widely used: mathematical, graphic, physical, simulation, etc. The implementation of logistics management is currently impossible without the appropriate information and computer support.

The principle of developing the necessary set of subsystems that ensure the process of logistics management: technical, economic, organizational, legal, personnel, environmental, etc.

The TQM principle (total quality management) – total quality management. Ensuring the reliability of operation and high quality of work of each element of the logistics system to ensure the overall quality of goods and services supplied to end consumers.

The principle of humanization of all functions and technological solutions in the LS. All solutions must comply with environmental requirements for environmental protection, ergonomic, social, ethical requirements for the work of personnel, etc. For example, one of the most important elements of the LS is personnel capable of performing their functions with the necessary degree of responsibility. In order to attract disciplined, qualified personnel to the field of MP management, modern working conditions, career growth prospects, increasing the prestige of such work, etc. are necessary.

The principle of sustainability and adaptability. The external environment of enterprises is characterized by a high degree of uncertainty and fluctuations in market demand for goods and services, sharp fluctuations in prices for raw materials, transportation services, fluctuations in the qualitative and quantitative characteristics of material flows, changes in the terms of supply and purchases, etc. In these conditions, logistics chains must be able to restructure, changing goals, parameters, optimization criteria, the operating program, i.e. adapt to new conditions of the external environment . This is an essential factor in a stable position on the market.

3. **The concept of planning strategy in logistics**

Logistics strategy is a direction of long-term development of the logistics system, concerning the forms and means of its implementation at the enterprise, interfunctional and interorganizational coordination and integration, formed by top management in accordance with corporate goals.

Among the large number of logistics strategies used by enterprises, one can distinguish between basic and additional strategies.

The main areas of logistics strategies include the following :

- minimization of logistics costs;
- improving the level of customer service;
- primary attention is paid to time parameters: minimizing the time of delivery of goods or delivery exactly at the time specified by the customer;

- the main focus is on providing services of very high quality;
- flexibility of the offered products implies the provision of specialized services or services taking into account the requirements of specific customers;
- flexibility of the volume of products offered requires special attention to be paid to prompt response to changing demand;
- technology – the desire to develop and use the most modern technologies in the field of communications, cargo tracking, package sorting, product identification, inventory control, etc.;
- location – the desire to provide services by being located in the most advantageous places, for example, at bus stops in city centers.

4.Types of strategic planning in logistics

Planning is a general management function that is part of the management ring. Planning of logistics activities is a systematic process of searching for opportunities to act, forecasting the consequences of these actions, developing a logistics project, forming management decisions, specific activities and deadlines for their implementation to achieve the set goals in the future.

To organize effective planning, an enterprise must have a planning system, i.e. an ordered structure of individual types of planning.

The main requirements for such a system are:

- *Documentation.* To coordinate planned calculations and control the implementation of plans, it is important that their main parts are documented.
- *standardization.* Documentation must be compiled in accordance with certain standards.
- *organization.* An organizational regime is needed that, on the one hand, would organize the activity of developing plans, and on the other hand, would ensure the flexibility of the planning system, the possibility of improvisation and adaptation to changing conditions;
- *accuracy.* It is necessary to clearly and reasonably determine the accuracy of measuring the characteristics of planning objects;

· *Coordination* . All private plans of the planning system must be coordinated both between different planning levels (plan integration) and within one level (plan coordination). It is necessary to coordinate goals, forecasts, events, means, actions of responsible persons, degree of necessity, urgency, hierarchy, sequence, flexibility, etc.;

· *continuity, flexibility and cyclicality*. Continuity is that when some plans have already been developed and are being implemented, others are being developed or refined, some plans are being developed in parallel. Flexibility is that the possibility of ambiguous conditions arising and the revision of plans taking them into account is taken into account. Cyclicality is the *systematic* revision, refinement, adjustment taking into account changed circumstances of the goals, objectives, and activities of the same plans as they approach the time periods of their implementation;

· *completeness*, i.e. coverage of all aspects of the enterprise's activities, including logistics activities.

Before you start planning, you need to clearly define:

- planning object (what is planned);
- subject of planning (who plans);
- planning horizon (for what period);
- planning tools (what to use for planning: financial resources, computing equipment);
- planning methodology (how to plan);
- coordination of plans (what, with whom and under what conditions).

The most common methods used to develop plans include the following: negotiations, adjustment of previous plans, various intuitive methods, graphical methods, calculations using spreadsheets, simulation modeling, expert systems, mathematical models (mathematical programming, network planning, etc.).

The results of the implementation of plans must be controlled. **Logistics control** is an orderly and ideally continuous process of processing logistics data to

identify discrepancies between planned and actual values of logistics indicators, as well as an analysis of these discrepancies in order to identify their causes.

5. Types of logistics strategies.

The most common logistics strategies include the "lean" strategy, the dynamic strategy, and the strategy based on strategic alliances. Let's look at them in more detail.

"Skinny" strategy

The "lean" strategy is based on the principle of cost management, i.e. producing the same or comparable products as competitors, but cheaper.

The goal of lean logistics is to perform each operation using less of each type of resource: people, space, inventory, equipment, time, etc. To achieve this, the lean strategy seeks to find ways to eliminate wasteful resource expenditure.

- *The quality of supplied resources* (raw materials, materials) may be too low to satisfy consumer demands.

- *Incorrect production or capacity levels* . There is production of products or capacity that is not currently needed.

- *Poorly streamlined process* . The presence of unnecessary operations that are too complex or too time-consuming.

- *Waiting* . Operations have to wait to be started or completed, materials – to be received, equipment – to be repaired.

- *Movement* : Products are forced to make unnecessary, excessively long or inconvenient movements during operations.

- *Stock* . Having too much stock leads to unnecessary complications and increased costs.

A typical approach to implementing a lean strategy is to: conduct a detailed analysis of current operations and then eliminate operations that do not add value; eliminate stops, simplify movements; use better technology to increase efficiency; locate facilities closer to customers to reduce transportation costs; look for opportunities to achieve economies of scale; and eliminate unnecessary links in the supply chain.

It should be noted that lean operations may not work in very dynamic or uncertain environments. In these cases, a more flexible strategy based on agility can be used.

Dynamic strategy

The goal of a dynamic strategy is to provide high quality customer service by promptly responding to new or changing conditions. There are two aspects of dynamism:

- *speed of response* to external conditions: dynamic organizations closely and constantly monitor consumer requests and respond to them promptly;
- *the ability to adjust logistics characteristics* taking into account the needs of individual consumers.

Organizations using a dynamic strategy are customer focused:

- strive to achieve complete satisfaction of consumer needs;
- create convenient access for consumers to their organization;
- respond flexibly and promptly to changing requests;
- design logistics so that it meets and even exceeds consumer demands;
- Conduct post-sales checks to ensure that consumers remain satisfied after their purchase;
- take care of preparing future transactions, always maintaining contacts with their consumers, potential buyers, etc.

Organizations that have satisfied customers reap important benefits - repeat business and positive word of mouth to other people and organizations.