

EVOLUTIONARY PATTERNS OF LOGISTICS

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ABSTRACT

The article is based on the results of long-standing research conducted by the authors in the field of logistics. It contains provisions and conclusions reflecting the evolution of the development of the concept of logistics in the last 25–30 years, since traditional approaches have radically changed and transformed from the basic concepts associated with

supply chain management to understanding of priority logistics tasks as of managing of consumers' demand chains under market conditions. Today the logistics approach must be implemented through the social purpose of human action. At the same time the engineering aspect of modern logistics, which is based on process-resource and network technologies, is becoming increasingly important.

Keywords: logistics, intralogistics, evolution, logistics methodology, information, services, network technologies, logistics management, integrated process, network-centric management.

Background. Despite all the complexity of today's economic situation, the logistical methodology has developed tremendously in recent decades. This was noted, in particular, at the Moscow international logistic forums held by the coordination council for logistics, the scientific and educational center for innovative technologies in logistics of MADI, the Department of Logistics and Transport Systems Management of MIIT.

Objective. The objective of the authors is to consider evolutionary patterns of logistics.

Methods. The authors use general scientific methods, comparative analysis, statistical method, scientific description.

Results.

I.

The traditional approaches to introducing logistics have changed dramatically. The engineering aspect of logistics, which is based on modern technologies of physical and social objects, is built on a process-resource basis as a universal method of any kind of human activity, provided that the synergy effect in management systems and profit effect in economic systems is identical. In modern conditions, this became possible with sustainable social and economic development, all-round saving of material, energy and labor resources, compliance with regulatory requirements that guarantee the quality of habitat, safety and environmental protection in the operation of technical and social complexes.

At the same time, one should not forget that the current post-industrial society differs from the pre-industrial and industrial by three important aspects: information becomes main productive resource replacing raw materials and energy; nature of productive and social activities is now mainly qualified as a service in contrast to mining, manufacturing or certain activities; science-intensive technologies, whereas the previous societies were characterized by labor-intensive and capital-intensive production and expenditures of non-material production, all other things being equal. It is the services sector that currently belongs to the most important activities related to the functioning of the economy and the satisfaction of vital human needs. Global practices show that the share of value added in the service sector is much higher than in industry and agriculture.

The logistical approach in Russia, in our opinion, should be embodied today mainly through the social development of human activities. Hence, the micro

environment of logistics management should comprise various interactions between managers and specialists of the system aimed at creating its rational organization. Such an organization assumes: the existence of an optimal structure for the selection and placement of personnel focused on continuous improvement of logistics management; control of basic and auxiliary logistical processes, effective use of production capacities; shortening the duration of the order execution cycle; coordination on the principles of logistics of relationships with suppliers, consumers, intermediaries and actors of socially oriented actions; systemic solution of economic problems.

The technological component of the micro environment of logistics management represents various types of interaction between raw materials, unfinished production and finished products and machines and mechanisms, between machines and mechanisms of various phases of logistics processes aimed at improving customer service, especially in the supply chain of commodity products.

The economic component of the micro environment of logistics management is a set of economic relations that determine the system's capabilities to implement the processes of supply and support of production, effective functioning in the market and in the sphere of providing services to population.

Different sectors of science have developed own traditions, own methods, special terminology. Therefore, an interdisciplinary approach based on objectivity is possible only in the case of a direct problem situation, which primarily involves the use of a single vocabulary base, when the underlying essence of any logistic scientific term lies, and the logistics is perceived as the initial organization of the system and the conceptual-process model.

The study of theoretical questions in the sciences presupposes the consideration and description of various points of view on a particular question, since the most varied or even opposite conclusions are brought to the common denominator by the method of complementary assessments to the moderator (transponder) of the scientific problem.

The variety of definitions of logistics led to the effect of the hyperbolization of some of its essential definitions and the underestimation of others. Moreover, it is known that logos as an ideal movement into being is harmony and order in the universe, expressed in the determinism of the movement of the



object of labor. Then the concept of logistics is to formulate a methodology for designing, coordinating and continuously improving its goals and objectives, features, aspects, properties, requirements, principles, elements, forms of manifestation. Through integration, this approach will allow coordinating, regulating and controlling the safety of the movement of resource value, for example, finished products, all along the way from the producer to the consumer [1, 2].

The system from the point of view of logistic management should be described as achieving a certain goal or performing a certain function. The principles used in logistics management are not some kind of discovery, for they are quite natural and simple, but their application becomes a turning point in the practice of management.

The main methodological principle of logistics is to harmonize the interests of participants in the supply chain of goods on the basis of an integrated system approach to achieve the goals set for the scheduled period [9].

The degree of demand for logistics depends on the level of socialization of people in society (understanding the commensurability of costs and labor results), the nature of the productive forces, technologies, social and legal situation and market relations in the country.

II.

The leitmotif of the development of logistics abroad was the transformation of the nature of consumer demand, i.e. its individualization. Then the logistics concept becomes the need to ensure the adequacy of logistical arrangements to the demand, and the structure of the logistics system in the form of a supply chain is a means of reconciling demand and targets through impact on the level of revenues and costs of functioning by financial, economic,

organizational and administrative measures. The sum of selectively involved links in the chain links is perceived by the environment as a whole. Such systems should cover demand planning based on the identified demand, provide process quality management, and make decisions taking into account the acceptable risks [7].

The integrated logistics process of an enterprise is designed to promote the emergence of use value with metric (normative) total costs (expenditures). The integrated value of any enterprise is created by the coordinated linear functioning of a set of individual processes. That is, the conclusion arises that it is necessary to replace the widely used concept of «supply chain management» in logistics with the notion of «demand chain management» which is more significant in terms of market forces, when linearity, determinism, normality, flexibility, complexity and timeliness of problem solving imply a rational combination of changing of production structure with changes in its management, since the most accurate and complete information on the market is consolidated within demand chain [3].

The main properties of logistics are as follow: systemic nature of management decisions, their safety, environmental friendliness, adaptability, synchronization over resource-cost flows with the achievement of synergy effect, operational reliability, financial management solutions, real-time regulation, information protection and information flow structuring, forecasting development strategy. For the appearance of the effect of synergy at the enterprise level, a clear description of functions, processes, procedures, understanding of the permanent essence of resources and the direction of their movement is needed [4].

The goals of integrated logistical support of the life cycles of products (systems) are: to influence



their development / design in order to ensure future optimal operation, to determine and refine the resources, and to deliver them with economically justified costs throughout the life of the product (system). The reasons for changing such support are serious market competition, forcing enterprises to strive for leadership in terms of costs and deepen their specialization in the key area of market competence for each of them, as well as globalization and product differentiation. Theoretically, the existence of a single integrated logistic chain of the enterprise presupposes the availability of the product of the whole chain of labor for its commercialization to the consumer.

Logistics as one of the components of the core of the sixth technological order of the development of the economy serves as an instrument for accelerated social evolution, since an introduction of a logistic concept to the society results in increased attention to it, makes us once again think about choosing the course, the correctness of the declared goals and objectives.

This is because the human psyche manifests itself in the perception of reality through its perception of the imaginary, symbolic and objective. The imaginary is a complex of illusory representations, the symbolic is the sphere of social and cultural norms and representations, the objective is what is given to man directly by experience of being. Only in the case when the concept of logistics has already been tried, one can judge what is primary in it (how?), and what is secondary (what?), i.e. it gets its interactive, evolutionary and spiral development. And it is here that it is necessary to show the importance of logistics as a universal mechanism for organizing production and management, to evaluate the prospects for its application under the sign of social efficiency.

Now the key problems are the availability of mobile devices and sensors, the development of profitable business models and safety [6, 8]. All this is built on scientific theories, architectures and models of network-centric control technology. A number of models have already been created (expanding logistic interaction, management of the life cycle of logistics systems, integrated security of supply chains). The development of means of logistical support of network-centric technology is continuing.

The following advantages can be distinguished when implementing the network-centric control technology in the PBL-system [5]:

- preparation by the supplier of raw data for the supply of spare parts and materials in standard formats;
- decrease of stocks within total costs (by 3–5 % for each unit of equipment), general increase in the productivity of the operating system;
- formation of a single database of the supplier enterprise and the consumer for servicing units of equipment by the ERP system;
- automated filling of the form for assignment of the identification code of the supplier and spare parts;

- lowering the cost of operating machinery by 2–3 % (increasing the index of organizational and technical readiness for use);

- creation of an effective system of service maintenance of machinery, focused on high productivity and cost reduction.

It should be noted that the «intralogistics» (operational logistics) appeared, which significantly promotes closed logistics systems inside firms and enterprises. It is a critical link in the fast-growing global transport chain, which is necessary in terms of an actively globalizing world. Intralogistics provides an opportunity for significant time, cost and energy saving, which makes it a key competitive factor both within a country and in the international transport services market.

Conclusion. Let us emphasize the main thing: the logistic approach reflects the needs of social development and should be implemented taking into account the social and life-supporting activity of a person. At the same time engineering aspect based on process-resource and network technology becomes more and more important for modern logistics.

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