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Main Aspects and Directions of an Increase in the Innovative Activity of Logistics Operators

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ABSTRACT

In this article, the authors have considered some aspects and perspectives that have both direct and indirect impact on the innovation activity of companies and firms that operate in the logistics market. The main tasks that have been solved in this article include the following: A study of trends and dynamics of development of the global logistics market; a review of transformations in external environment defining the need to strengthen the innovative activity of logistics operators; systematization of the areas where the innovative activity of logistic operators may be implemented in the present and in the near future.

Keywords: Innovations, Logistics, Material Flow, Freight Traffic, Warehousing, Safekeeping
JEL Classifications: L10, L62, M13

1. INTRODUCTION

In today's world, where the service sector plays an increasingly significant role, the development of the corporate and business sector is also difficult to imagine outside the innovative context (Yeow and Edler, 2012; Dudin et al., 2015). Innovations are an essential factor, which allows companies and enterprises to create high value-added in the final product (goods, works, and services). All this fully applies to the logistics sphere of activity.

The activities of logistics companies, which are constantly competing with each other not only for access to resources and infrastructure, should be characterized by a high or sufficient innovation activity due to the following main reasons (Dudin and Frolova, 2015; Garnov and Kireeva, 2012):

1. The global transport and logistics market has already been formed, but it is constantly developing focusing on systemic and comprehensive customer services;
2. Consumer preferences will be given to the logistics company, which can both find a comprehensive approach to services provided and predict changes in consumer sentiment before consumers are aware of it;
3. The growth of the scope of logistics business should be characterized by both the economic balance and the required level of profitability in order to preserve the capacity for sustainable development.

Logistics companies (they are very often called: Logistics operators and logistics providers) simultaneously operate in two segments: B2B and B2C (business-to-business and business-to-customer) (Bowersox et al., 1991). In each of the segments, there are certain requirements to the quality of services, their pricing, technical-technological and other economic and value indicators. Therefore, activity of logistics operators should be diversified and simultaneously be focused on the needs of each of these segments.

In this article, a set of general scientific and special research methods have been applied. General scientific research methods

(analysis and synthesis) revealed dynamic and structural specifics of the development of the global logistics market, allowed to determine the future direction of development. Special research techniques (forecasting and modeling) allowed to develop a set of recommendations aimed at increasing the level of innovation activity of logistics operators in compliance with global trends and forecasted changes in consumer demand in key market segments.

2. RESULTS

During the period from the last quarter of the twentieth century to the present time, the global logistics market has passed three main stages in its development (Panarina, 2016.):

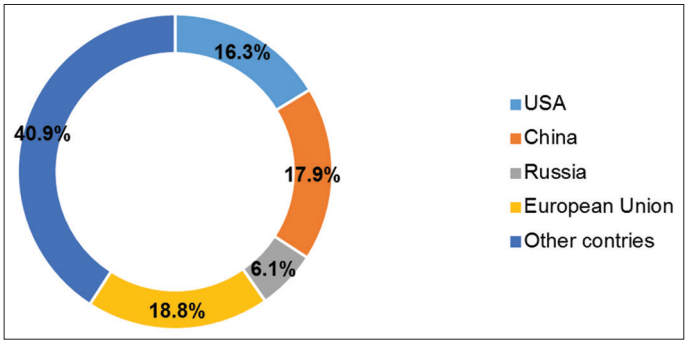
- The first stage was associated with the formation of the market, its key segments of infrastructure (1970-1990);
- The second stage was characterized by the development of the service areas in logistics (1990-2000);
- The third stage was marked by a qualitative upgrading of the market and the transition from fragmented logistics to systemic logistics (from 2000s to the present day).

The total volume of the global logistics market as of 2015 was estimated at the level 7.4-7.7 trillion US dollars, accounting for about 10% of the world GDP. As for the structure, the global logistics market is mainly formed by three countries (USA, China, Russia) and the European Union countries (Figure 1).

About 59% of the total volume of the global logistics market accrue to three countries and the European Union countries. At the same time, if the global logistics market structure is considered by the main customer segments, it may be noted that almost 80% of this market segment is formed by the B2B segment. In terms of types of services, transportation, freight forwarding, warehousing and safekeeping services are the most in-demand services in the logistics market.

According to various assessments, logistics outsourcing currently forms from 20% to 40% of the global logistics market (Schmitt et al., 2015). Such variation in the expert assessments is associated with different understanding of the nature of logistics outsourcing (full transfer to a third party of the right to fulfill logistics functions or logistic business processes and the elimination of these functions or processes from the business model of the client of the logistics operator). Some researchers rather often include contract services

Figure 1: Structure of the world logistics market by countries (as of 2015) (Panarina, 2016)



in logistics outsourcing provided by the logistics operator to its client on a conditional-permanent basis.

From the organizational and economic point of view, the modern logistics market can be represented as follows (Figure 2).

Thus, the logistics market comprises two main segments, which have already been mentioned above (business-to-business and business-to-customer segments), and each of these segments is characterized by its own specific nature of services provided.

The segment B2C is generally characterized by the demand for temporary, periodically provided logistics services (transportation of tangible assets, as well as transportation and forwarding of documents, safekeeping of valuables and documents).

In turn, in the segment B2B three areas of logistics services are in demand:

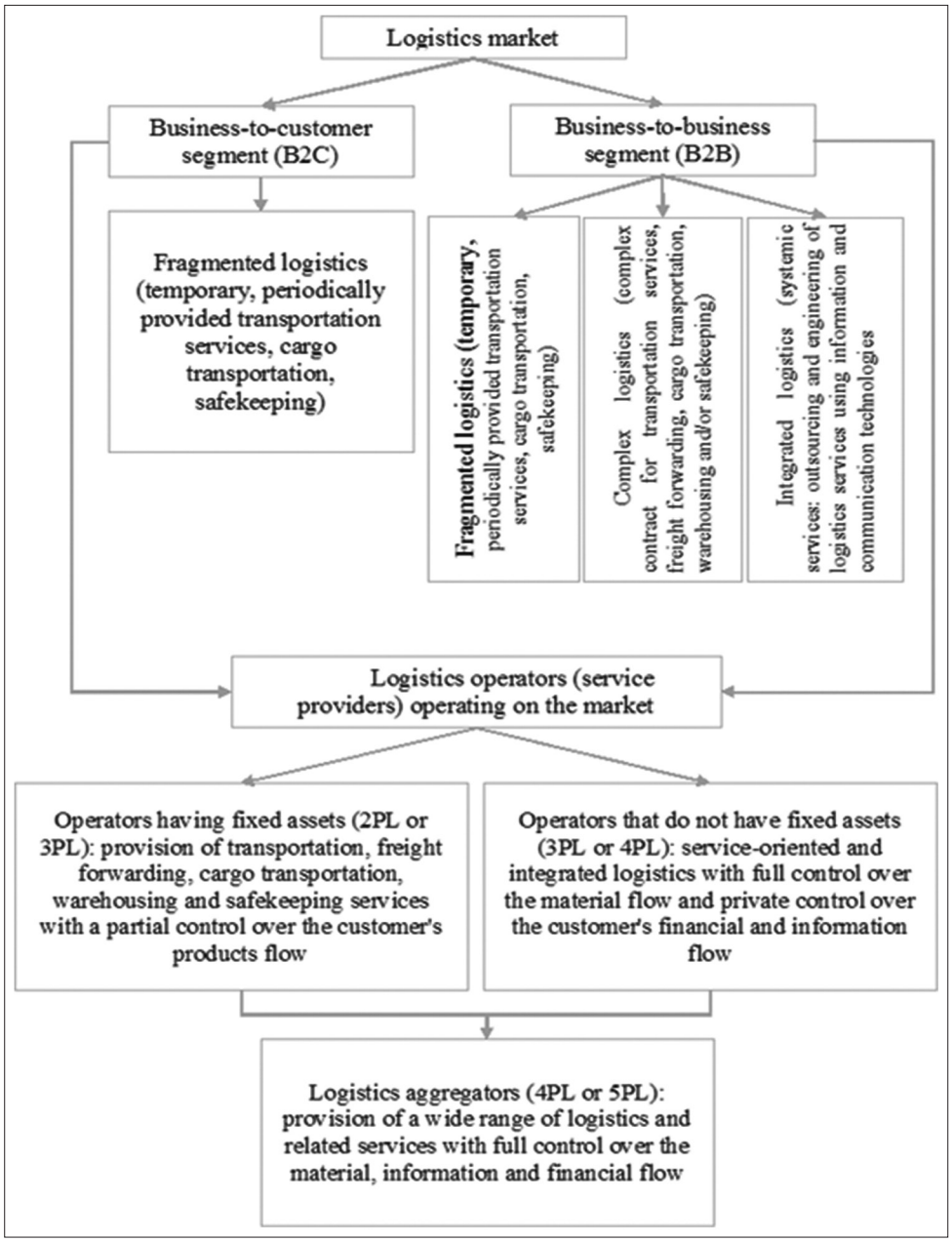
1. Fragmented logistics: Temporary, periodically rendered services (transportation of tangible assets, as well as transportation and forwarding of documents, safekeeping of valuables and documents) on the basis of contractual relations between the logistics operator and its customer;
2. Complex logistics, which involves including all of the above-mentioned services, as well as possible additional services provided to the customer of the logistics operator upon a set of contractual arrangements;
3. Integrated logistics, which suggests that the logistics operator takes the customer's logistics business processes on outsourcing and manages these processes based on modern information and communication technologies.

In accordance with Figure 2, some types of logistics operators can be distinguished depending on possession of assets and the degree of control over material, information and financial flows that are generated in the customer's activity:

a. Logistics operators (2PL and 3PL[1] providers) having fixed assets that provide such services as cargo transportation, warehousing, freight forwarding and safekeeping. As a rule, these operators, as part of their obligations, implement only partial control over the products flow formed in the client's activity;
b. Logistics operators (3PL and 4PL providers) that do not have real assets and provide service-oriented and integrated logistics services. Thus, as part of their obligations, operators provide full control over material, partly financial and information flows generated in the client's activity;
c. Logistics aggregators (4PL and 5PL providers), which may or may not have fixed assets, but, at the same time, such operators provide full control over material, financial and information flows generated in the client's activity. This control is usually provided on the basis of the network information and communication technologies.

As for the future directions of development of the global logistics market, the following key trends can be distinguished (Andreev, 2011; Apostol, 2012; Akintoye et al., 2000; Guana et al., 2006):

Figure 2: Organizational-economic structure of the global logistics market



- Firstly, rates of economic growth of the service sphere will outpace the rates of growth of material production due to the higher value added of services, including this will be due to the preferential choice of the consumer upon the "make or buy" principle in favor of the purchase of services, characterized by high quality, manufacturability and the price level corresponding to the quality and manufacturability. The main direction in the geographical and territorial understanding of prospects of the global logistics market development will shift from the US and European direction towards the Eurasian direction;
- Secondly, the B2C segment will be characterized by a modification of the demand (temporary, periodically provided services will be replaced by complex services). This is due to the popularization of group or joint purchases, purchase directly from the manufacturer, purchases in online stores around the world. This means that freight forwarding and safekeeping services supplemented by a variety of services (e.g., financial control of operations, disposal of obsolete material assets, tracking of material values and documents) will be constantly in demand in the B2C segment;
- Third, the B2B segment will systematically turn to the use of integrated logistics and logistics outsourcing in order to reduce the cost of activities of corporate and business entities. In this segment, there will be a steady growth of demand for traditional logistics services, additional services, as well as for engineering services, which will include physical protection and insurance of high-value goods and documents, cash flow control, inventory control, monitoring of the effectiveness of procurement activities, the use of resources, as well as the sale of finished products by means of those or other distribution channels.

3. DISCUSSION

The innovative activity of all economic entities, including logistics operators, is a special kind of activity aimed at practical efficient and effective application of scientific fundamental and applied research in primary and secondary business processes. The use of high technology solutions is the main difference between innovations and local enhancements (Clark et al., 2012; Bei, 2003; Conner, 1991).

The basic idea of increasing the innovation activity by logistics operators is to increase the value added in the price of services and simultaneously provide a stable growing demand for these services.

Modern research shows that logistics is 90% of information technologies and 10% of works and services associated with the material flow organization (transportation, forwarding, cargo transportation, warehousing and safekeeping) (Gunasekarana et al., 2004). Respectively, further innovation-based development of logistics operators will be primarily due to the use of new information and technological solutions.

From this point of view, two directions of information and technological innovations, which can be used in the activities of logistic operators, are the most promising ones:

- The first direction can be described as a strategic level of logistics, which is aimed at the automation of material flow management processes in the provision of logistics services;
- The second direction may be regarded as an application level of logistics, which is linked to the automation of the material flow to a greater extent.

The information technologies that allow the logistics operator and its customer to interact remotely without performing a plurality of agreed operations and actions may be used within the first direction. Among such technologies we distinguished solutions related to (Essig and Arnold, 2001; Junga et al., 2008; Van Hoek, 1998):

a. The consolidation of shipments of similar goods from a variety of clients of the logistics operator in the framework of one-type transport corridors that allows to optimize transaction costs of the operator and its clients;
b. The provision of information and mediation services of a customs broker and insurance agent, which allows the logistics operator to add value to its services by creating new package proposals;
c. The development of information systems used for supporting clients' logistics business processes and firstly it is necessary to pay attention to mobile applications and light versions of software applications;
d. The implementation of integrated information systems, in which a mutual access of the logistics operator and its clients to internal databases is allowed. This eliminates duplication of logistics functions;
e. The use of new software optimization solutions for the organization of warehousing and safekeeping of material assets of the logistics operator.

Application solutions in the sphere of information logistics innovation may be aimed at (Essig and Arnold, 2001; Junga et al., 2008; Van Hoek, 1998):

a. Advanced use of multimodal transport, which significantly increases the speed of cargo delivery and increases turnover of inventory and customer assets. In this direction technologies of unmanned delivery of small cargo (mail and similar unmanned flying vehicles) can be used;
b. The use of electronic markers or chips for goods with tangible assets (an electronic marker or a chip through satellite monitoring informs of the cargo condition, its safety and integrity, location) that allows to provide double control of cargo condition (both by the logistics operator and its client) during transportation;
c. The use of cycle-independent and mobile stations of warehousing and storage of goods (tangible assets), an access to which a customer receives with an electronic or digital code provided by the logistics operator;
d. The use of multi-agent networks of logistics operators by creating a single universal geographically distributed transport and warehousing infrastructure, an access to which is provided to all logistics operators included in the multi-agent network, as well as to their customers;
e. The use of diversified solutions, in which logistic operators consolidate the movement of material flow with quality, marketing and innovation management processes carried out on the client's side.

4. CONCLUSIONS

Innovations in the logistics sphere cover not only all the processes ensuring the formation of the logistics flow (the logistic flow includes material, financial and information flows mediated by the physical movement of goods in time and space), but, at the same time, innovations in logistics may cover all the functions performed by logistics operators within the framework of commitments to their customers (both in B2B and B2C segments). Innovations in logistics are such scientific application solutions that allow both to improve and modernize the material management processes, as well as interrelated information and financial flow both on the side of the logistics operator and its customers. But this is only one of the aspects of the innovation activity of logistics operators. The second important aspect of the innovation activity of logistics operators should be aimed at the modernization and improvement of the physical organization of cargo transportation (transportation and freight forwarding), as well as the organization of warehousing and storage of tangible assets.

The use of innovations allows logistics operators to increase the value added to their services, as well as to increase the value of their services for customers. An increase in the value of logistics services is that the customer's time, resource and other economic costs are reduced due to the fact that the logistics operator has qualitatively updated and modernized service processes with the use of new high-tech solutions. In other words, the innovation activity of logistics operators can be considered as a form and method of obtaining new competitive advantages (Lin and Jerry, 2011; Songa and Parola, 2015).

It is noteworthy that the interaction of logistics operators with their customers of the B2B segment is transformed and goes from hierarchical subordinate forms (when the logistics operator adjusts to the particular client's business or, conversely, clients adjust to the specifics of the logistics operator's business) to partnership (when both the logistics operator and its clients optimize and unify business processes in order to maximize economic and other benefits for all cooperating parties through full co-operation).

Partnership between logistics operators and their clients in the B2B segment provides a synergy of economic benefits multiplying the positive effects of cooperation. But, in addition, intense and full partnership of logistics operators and their clients of the B2B segment allows to increase direct and indirect benefits at the macroeconomic level (ensuring intensive GDP growth and an increase in the contribution to the national welfare of the logistics market, creation of new workplaces and an increase in the social responsibility of business, the development of transport and logistics infrastructure). Innovations in logistics are obviously not only essential for the sustainable development of logistics operators, but also one of the most important incentives for the balanced economic growth at the national and global level.

The authors of this article have reviewed the most important aspects of an increase of the innovative activity of logistics operators, the main directions for the implementation of innovations in logistics processes and functions, as well as the main advantages that the logistics operators can obtain from innovation studies. It should be understood objectively that innovations and innovative activity of logistics operators always present a certain risk, which is that the introduction of high-tech solutions cannot provide necessary and planned positive effects. Therefore, in the following articles on this topic the authors will refer to the methodological aspects of the comprehensive assessment of benefits and risks associated with the innovative activity of logistics operators.

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