Development of logistics and supply chains in freight-generating sectors of economy

Abstract. The article deals with Kazakhstan's freight-generating sectors of the economy. It covers transport and logistics problems with regard to the required criteria of such services. The economic development of production chain is revealed. Recommendations on logistics services improvement as well as efficiency of logistics units in the freight-generating economic sectors are developed.

Keywords: Logistics; Supply Chain; Logistics Services; Freight Industry; Transport and Logistics Hubs

JEL Classification: L6; L7; L8; L9; R4

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1. Introduction. Most of the approved strategies on development of economic sectors in Kazakhstan (industry, construction, agriculture, transport, etc.) do not take into account the intersectoral segment, requirements to suppliers and consumer demand. They do not focus on the formation of the complete logistics chain and product distribution, the effective functioning of which largely determines the success of the measures proposed in the strategy.

The research is based on the presence of a number of gaps in the chain of product promotion (research – implementation – production – sale – use – disposal): fragmentation of research and production; the impact of the gap between basic and applied sciences; disparities of commodity infrastructure.

It is not necessary to create an economic policy based on the development of industrial production (as it was before). One has to take into account the logistics approach aimed at a comprehensive system to ensure the entire material flow chain, including the marketing of goods, production of competitive products and the supply of production.

One of the solutions to the problem of the elimination of these gaps and the development of economy core sectors towards the production of competitive products is to develop logistics systems in manufacturing complexes (holdings, corporations, consortiums, business groups), covering the whole chain of product creation: from the research development and design through production to the sales, servicing and disposal.

An analysis of the current situation in the field of logistics in the transport activity of the enterprises of transport and logistics services, which negatively affects the competitiveness of products. B. U. Syzydykbaeva and J. S. Raimbekov (2012) emphasise that the market of transport and logistics services is underdeveloped, while V. Mozharova (2011) stresses on the poorly developed infrastructure [1; 2].

Solving the problem of sustainable development of the economy is impossible without taking into account logistical factors.


These studies considered problems of logistics services specific to a particular country’s business environment; they assessed the impact of various factors on the activity of the enterprises of transport and logistics services; the authors studied logistics services provided to customer segments, and analysed logistics providers in the domestic market and international logistics networks.

A. Heiko (2010) gives development scenarios of the logistics services industry until 2025 on the basis of statistical analysis where the main factors are as follows: politics, economics, culture, agriculture, transport, etc. Heiko considers the industry status of the economy [7]. It is concluded that the main factor in the development of logistics services is the structure of industries and customer requirements for logistics.

The research [8] deals with the development of effective control mechanisms of production and development of transport potential methods of cooperation of related industries at the stage of the procurement and sales through the use of modern logistic approaches that create a comprehensive and systemic organisation of their operation.

Based on the study of Chinese manufacturers and providers of logistics services to local and foreign customers, Shams Rahman and others (2011) [13] identified the following disadvantages: fierce competition, price pressure, customers are focused on the different types of services compared to local clients. It is suggested to secure expansion of service activities and requirements to them by improving the quality of logistics services based on a study of the needs of the transfer of the functions of logistics outsourcing, as industrial, commercial and service companies prefer to give operational logistics functions to logistics intermediaries (operators, service providers) in the developed world focusing on core competencies and coordinating functions of logistics.

R. O. Large et al. (2013) examine a related question related to the extent the buyers of logistics services take into account the aspects of sustainable development [11]. It was found out that the procurement companies value environmental and social aspects. A fundamental prerequisite for sustainable procurement-oriented logistics services can be seen in the consciousness of the need to incorporate sustainable aspects in economic decision-making. The study on logistics service providers (LSP) by M. Rajahonka (2013) show that LSP must use a modular approach when choosing a service provider of the logistics industry, as customer requirements are becoming more diverse, and services, processes and organisational networks are becoming increasingly complex [14]. L. Li (2011) evaluated the effectiveness of logistics services from the point of view of manufacturers, determining the factors affecting the satisfaction of the manufacturer [12].

The issues of transport and logistics service quality are also relevant for Kazakhstan. Kazakhstan is losing its closest neighbors on the provision of transport and logistics services. The issues of transport and logistics outsourcing are very high and largely exceed the level of developed countries in terms of logistics services, which is well below the global and Russian indicators.

The data in Table 1 indicate that Kazakhstan is far behind the world trends in the development of the logistics management component and the complexity of their provision.

First of all, it should be noted that logistics costs in our country are very high and largely exceed the level of developed countries. Today, the share of logistics costs in Kazakhstan can be up to 25% of the cost of the final product [1]. This average figure is 11%, whereas it implies 14% in China, 11% in the EU, 10% in the US and Canada, etc. (Turkensteen, 2012) [20]. At the same time, a significant number of scientific problems concerning the formation of an effective economic mechanism of development of the supply chain logistics, logistics transformation of economic systems and its adaptation to the conditions of Kazakhstan remain unresolved.

3. The purpose of the research is to study transport and logistics problems of the core sectors of the economy; to define the needs of logistics services; to develop recommendations to achieve the required level of development of logistics for freight traffic sectors. To conduct the research we used the following methods: polls among professionals of transport and logistics companies, industry, trade, tourism and agriculture.
We identified transport problems of the key sectors of freight traffic during our interview with 11 experts from different sectors of the economy. The experts were executive managers with over 15 years of experience in the industry.

Based on the analysis of foreign and domestic literature, we selected 6 criteria that, in our opinion, have the greatest influence on the definition of requirements and the need for logistics services: 1) stability (reliable service), and affordability; 2) safety and security of cargo transportation; 3) the speed of delivery; 4) service (quality of service) and convenience (transportation, registration documents); 5) cost (cost of transportation); 6) national priorities (the most important areas of logistics industry, government support).

We used a five-point scale to measure the results. Each question has the scores from 1 to 5. The total mean score for each criterion was calculated as the average of scores for each expert.

4. Results. Below are the main problems in the sectors of freight traffic relating the provision of logistics services.

1. Agriculture: the lack of professional transport of agricultural products; difficulties in exporting products in the southward and westward directions; long processing of freight at the border with Uzbekistan; lack of awareness of agricultural producers of the potential markets for grain and transport routes; competition in the export of grain through the ports of the Black Sea region from Russia and Ukraine.

2. Coal industry: lack of infrastructure for transshipment of coal at the border with China; undeveloped export routes in the direction of China.

3. Oil and petrochemical industry: high railway tariffs on transportation of oil and oil products; no single transport operator.

4. Metals and Mining Industry: insufficient capacity of the transport route to China; low safety of goods during transportation of finished metals (especially ferrous-alloys and non-ferrous metals) by gondola cars; lack of maritime transport.

5. Light industry: lack of 3PL market operators; low speed of delivery (lack of railway communication with a «rigid» schedule); low safety of goods.

6. Food industry: a lack of 3PL market operators; low speed of delivery (lack of railway communication with a «rigid» schedule); low safety of goods.

7. Construction and building materials: high transport costs; lack of awareness of the potential market for concrete products; lack of railway communication with the ports of the Black Sea region.

8. Chemical industry: lack of competence on the transportation of volatile products (particularly organic compounds) by gondola cars; lack of maritime transport.

9. Mechanical engineering: problems of preservation of valuable goods (especially high-quality metals) by gondola cars; lack of maritime transport.

10. Food industry: a lack of railway communication with the «rigid» schedule; low safety of goods.

11. Tourism: low accessibility of key tourist sites (free economic zone «Burabay»); inadequate development of regional and international network of air links; low speed of rail and bus transportation; underdevelopment of the hotel, entertainment infrastructure; poor state of roads; shortage and high wear of the rolling stock (air, rail and road).

12. Trade (wholesale and retail). Logistics Services: lack of 3PL market operators; low speed of delivery (lack of railway communication with a «rigid» schedule); low safety of goods.

13. Construction and building materials: high transport costs; lack of awareness of the potential market for concrete products; lack of railway communication with the ports of the Black Sea region.

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Having applied the expert evaluation method, we determined the aggregated weighted assessment of the impact of each method on the logistics activities of the industry. It is possible to obtain a complete picture of the level of development of key techniques in the form of a cobweb diagram (Figure 1). The study revealed a great impact of speed, quality and preservation (the obtained value is above the threshold of 0.5), as well as a significant influence of stability. The results of the study also showed a slight impact of national priorities and cost. According to the study, these methods are capable of providing a stable positive dynamics of logistic processes.

We can achieve the necessary level of criteria for the freight sectors of the economy by: increasing the accessibility and speed of delivery in agriculture; increasing national priorities and the availability of transport in the coal industry; increasing national priorities and security in oil and petroleum industries; increasing national priorities, availability and security of transport in mining and metallurgical industry; increasing production of steel products, which will increase the demand for transport services; increasing the safety and speed (5 points) in light industry; increasing national priorities and availability (4 points) in production of building materials; improving transport safety (5 points), national priorities and availability (5 points) in production of building materials; improving transport safety (5 points), national priorities and availability (5 points) in production of building materials; increasing national priorities and security in oil and petroleum industries; increasing national priorities, availability and security of transport in mining and metallurgical industry; increasing national priorities and availability (4 points) in production of building materials; improving transport safety (5 points), national priorities and availability (5 points) in production of building materials; increasing national priorities and security in oil and petroleum industries; increasing national priorities, availability and security of transport in mining and metallurgical industry; increasing safety and speed of delivery (5 points), convenience in trade (wholesale and retail); increasing the availability, safety, speed, convenience in tourism.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Agriculture</th>
<th>Coal industry</th>
<th>Oil and petroleum industries</th>
<th>Mining (except for mining energy and metallurgical industry)</th>
<th>Light industry</th>
<th>Food Industry</th>
<th>Building and construction materials</th>
<th>Chemical industry</th>
<th>Mechanical engineering</th>
<th>Trade (wholesale and retail)</th>
<th>Tourism</th>
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<tbody>
<tr>
<td>Stability and availability</td>
<td>2.1</td>
<td>2.1</td>
<td>3</td>
<td>1.7</td>
<td>3.6</td>
<td>3.3</td>
<td>2.5</td>
<td>2.5</td>
<td>2.9</td>
<td>3.8</td>
<td>2.3</td>
</tr>
<tr>
<td>Safety and security</td>
<td>1.6</td>
<td>2.9</td>
<td>1.7</td>
<td>2.7</td>
<td>3.7</td>
<td>2.3</td>
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<td>2.7</td>
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<tr>
<td>Service and convenience</td>
<td>1.8</td>
<td>2.2</td>
<td>3</td>
<td>2.8</td>
<td>2.1</td>
<td>4</td>
<td>2.9</td>
<td>2</td>
<td>3.5</td>
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<td>National priorities</td>
<td>1.5</td>
<td>2.3</td>
<td>2.3</td>
<td>2.3</td>
<td>2.9</td>
<td>1.2</td>
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<tr>
<td>Cost</td>
<td>2.3</td>
<td>2.3</td>
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Fig. 2: Assessment of the impact of methods to promote logistics activity authoring (CL – current level; RL – required level)

Source: Composed by the authors
It is clear that the most important actors in the goods movement is wholesale and transport links, as well as logistics in the sectors under consideration.

Wholesale businesses in the process of sale of goods may perform work on the logistics services: storage of goods, transport, freight forwarding, packing, processing, sorting, marking, readable codes marking products. According to foreign sources, the first place belongs to the transportation, followed by storage services, labeling, sorting and packing of goods among the paid services provided by the wholesale enterprises in the developed market [3, 452-468]. As for Kazakhstan, these services, except for storage, have not been widely developed until now.

A significant impact on the cost of the promotion of goods to the end user has the organisation of transport in the distribution process. In countries with developed transportation logistics, specialised transport companies are generally involved in it. At the beginning of market reforms in Kazakhstan, transport was carried out mainly by specialised transport companies. Currently, there is a widespread practice of self-fulfilment which is not typical to wholesale transport operations. As a result, the majority of transportation path utilization ratio is not more than 0.6, i.e. it does not provide full capacity utilization of transportation.

5. Conclusions. Effective operation of enterprises in various sectors of economy (industry, trade, construction and agriculture) is no longer sufficient for extensive development without taking into account logistics. The essence of the company’s specialisation is to focus on customer service group with similar needs and technological conditions for performing transport, handling loads with similar transport and processing properties, to use the same type of rolling stock and other technical facilities.

Each of the surveyed industries has its own characteristics and requirements for the organisation of supply. This sectoral approach to the management is to work together with customers to optimise the quotation depending on the unique characteristics of each sector of the economy.

Such an approach is impossible without specialised infrastructure and centers of competence in SCM (Supply Chain Management), which can provide specific expertise necessary for a specific sector.

It is necessary to develop new innovative logistics technology, to introduce new solutions, clearly defining the terms of business growth. The main trend in the world is the transfer of the companies of the whole complex of logistics services in the management of a single professional operator. This is a good opportunity to optimize costs and ensure high quality and efficiency of logistics. Kazakhstani enterprises feel the apparent lack of such proposals.

There is a need to conduct further studies on the subject and apply the obtained results to optimise capacities of industrial enterprises, so that non-core freight logistics services are transferred to the logistics companies. To achieve this goal, it is advisable to create logistics organisations in transport enterprises, centred cleared of non-core capacity, which is capable of conducting strategic planning of the development, designing and implementing business projects to date, using a rich experience of developed market economies.

References