LOGISTICS CENTER: INFORMATION SUPPORT POINTS

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ABSTRACT

Justifying the terms of interaction of participants in the process of cargo transportation, the author considers measures of national and local character for increasing the efficiency of transport and logistics centers (TLC). Particular emphasis is placed on information systems, the role of which is defined as the main one, and their participation in the work of TLC – as decisive in the implementation of management actions in servicing clients-customers of railway services. Functions of information support of logistic activity are shown.

Keywords: transport, logistics, TLC, information technologies, navigation systems, cargo transportation, supply chain management.

Background. *The dynamics of development of transport and logistics services in Russia shows that transport-storage and commodity transport complexes (TSC), as well as transport and logistics centers (TLC), which form a single system of interaction, play an increasingly important role in managing the delivery of goods in supply chains of commodity producers. These objects become system control elements and thus the transport infrastructure of a new type develops.*

To increase the effectiveness of TSC, TLC and the quality of information, transportation, warehousing and other logistic services provided with their participation, as practice shows, measures of national and local character are necessary, namely:

- *adoption of unified standards for information transfer;*
- *development of modern navigation systems for efficient monitoring of the commodity flow, including satellite;*
- *creation of a system of information support for cargo transportation using modern data transmission networks, including the Internet;*
- *development and implementation of international standards;*
- *development of information service systems of the transport business and consumers of logistics services.*

The effectiveness of management of any logistics systems depends to a large extent on information support. A feature of most processes, including transportation, is constant expansion of information links, which are being improved and acquire new functions through the use of modern technology. Information systems process incoming data on internal and external business activities and provide management with a continuous flow of information to make operational and reliable decisions.

Objective. *The objective of the author is to consider measures to improve the efficiency of transport and logistics centers through enhancement of information exchange technology.*

Methods. *The author uses general scientific methods, economic assessment, evaluation approach, comparative analysis.*

Results. *In order to increase the competitiveness of rail transport, the most advanced logistics and information technologies are increasingly needed. The role of the basic elements of information support (collection, storage, processing and transfer), taking into account the growing needs of customers, should be fulfilled by:*

- *intermodal and multimodal logistics complexes;*
- *transport and logistics centers of all levels.*

Only TLC will allow the exchange of information through a phased introduction into the control bodies of all participants in the transport process.

The modern transport and logistics center is a complex that provides a whole range of services for cargo servicing. When creating and operating a TLC, the following principles should be considered [1]:

- *openness – accessibility for companies of different forms of ownership (this primarily refers to the location and order of using the services of TLC);*
- *integration – participation of various modes of transport and the use of joint efforts through the creation of active cooperation, including the costs of maintaining warehouses, terminals, information systems and technologies, the development of new services and training of personnel;*
- *multifunctionality of participants of cargo delivery to the consumer (carriers, forwarders, agents, stevedores, customs and other brokers, etc.);*
- *availability of production facilities – buildings, structures, equipment;*
- *information content – maintaining the level of information systems for the purposes of quality customer service (computer network, identification of consignments and routes, automated terminal management system), and maintaining the high market potential of intermodal services and their competitiveness;*
- *intermodality – orientation to transport and logistics services of multimodal transportation in the interaction of various modes of transport (roads and railways, sea and inland waterways, pipelines, airways).*

Multimodality as a structural part of intermodality, we will clarify, provides fast transshipment of goods from one type of vehicle to another. Here a special role is played by the enlarged standard cargo unit (container, trailer, contrailer, etc.). An obligatory condition for logistic management in this case is the operation of technical achievements and innovative technologies, as well as the availability of logistics information networks that unite all participants in the transportation of goods. Logistic services penetrate the activities of the client company at all levels: from providing transportation, warehousing, forwarding to organizing and planning the entire process from door to door.

The establishment of TLC network is a complex solution that allows not only to optimize cargo operations in transport hubs, but also to realize the potential of containerization of cargo flows, to create unique conditions for development of new types of transport activity, the market of logistics services, generation of new business relations through the emergence of a modern multi-functional terminal-storage infrastructure. It is assumed that based on a wide range, price attractiveness and uniqueness of some types of logistics services provided by TLC facilities, a significant part of cargo owners and operators in the formation of supply chains will prefer to take advantage of the new capabilities of their partner.

A special role in the functional structure of TLC is played by an information block that performs a parallel analytical function. Logistic functions of the modern type can be classified according to the following characteristics:

- ***basic*** *– reflect the links of the logistics chain from door to door in the relevant spheres (for example, production, trade, regions, transport, warehouses, ports, stations, terminals, customs and border area, etc.);*
- ***operational*** *– reflect specific production and technological actions in all parts of logistics delivery of cargo (for example, reception / delivery of cargo, loading / unloading, routing, etc.).*

Typically, these functions are performed at all levels in three directions – planning, monitoring and information.

At the same time, the functions of information support include:

- *participation in development and implementation of new information products in accordance with international standards and requirements;*
- *information interaction with all participants in the transportation process;*
- *information support for clients in various fields: cost, range of services, terms of transportation, transfer of information about the location of cargo in real time;*
- *monitoring of rolling stock state and movement of goods.*

The presence of integrated information and automated systems is an indispensable condition for conducting logistic activities, efficient functioning of TLC (TSC) and creating a single information and logistics space. For information support of TLC (TSC), electronic technologies such as EDI-technologies, cargo and rolling stock monitoring systems, navigation systems are used. All of these means are a kind of tool base for formation of automated management systems in TLC, which allow for implementation of everyday organizational and managerial functions.

In Russia rail transport uses a set of interconnected information and control IT systems and technologies of JSC Russian Railways. They include:

- *network integrated information management system SIRIUS;*
- *automated system of centralized preparation and registration of transport documents ETRAN;*
- *«Cargo express», «Dispark», «Discon», ASOUP, etc. systems.*

One of the systems used in the Central Directorate for management of the terminal-warehouse complex of JSC Russian Railways became the information-analytical automated system AS TESKAD.

In the AS TESKAD system, automation takes place in three directions [2, 3]:

- *operational control and accounting of production activities;*
- *inventory of infrastructure facilities;*
- *analysis of production activities.*

The technological process of terminal-warehouse handling of cargoes at TSC and TLC provides for the possibility to maintain a static (electronic warehouse passport) and dynamic models (operational control and accounting of warehouse operations) and is tied to the main logistics procedures of JSC Russian Railways.

In the electronic passport of TSC on the basis of the characteristics of the storage complex the following data are provided:

- *summary data on the technical equipment of the complex;*
- *volumes of cargo handling and commercial operations;*
- *a warehouse map with marked zones and cells of storage;*
- *staff and actual number of employees.*

Data on the placement of goods in cells are formed automatically on the basis of information from primary documents on admission and delivery of inventory items for storage.

In addition, AS TESKAD registers a client's order for execution of works and services. The order information can be entered:

- *in the personal account of the client at the information portal on the Internet;*
- *as an electronic file in Microsoft Excel format by e-mail.*

The order is issued by the receiver of the cargo and baggage directly in AS TESCAD in the case of the first or one-time call of the client, as well as in case of data transfer on paper.

When filling out the «Order» form, the following fields must be filled in: customer; contract number; the period of order fulfillment; service station; name of works and services; name of cargo; address of delivery / export of goods; date of delivery / export of goods; measurement units; volume.

Since TSC and TLC are a logistic system, the principles of logistics are fully applicable to them. From the point of view of the system approach, logistics methods provide technical and technological unity of the transport-warehouse process and allow to influence the management object so that the tasks of the warehouse complex are effectively and efficiently achieved. In addition, logistic methods allow to predict the parameters of cargo and goods flows, create flexible systems for managing the movement of goods and other valuables, optimize the stock of goods in warehouses, plan the transport process in conjunction with warehouse and production, and determine rational shipping routes.

At the same time, it is necessary to remember that information flows in TSC and TLC are characterized by heterogeneity of data and documentation units, a large number of information providers and consumers, as well as complexity of information networks and multivariate nature of optimization solutions.

Conclusion. *Thus, in order to achieve the optimization objectives of TLC, it is necessary to use more widely and systematically new logistics technologies in the framework of innovative and modernized information systems, to offer measures to improve interaction, strengthen loyalty and customer satisfaction. All this in the long run will bring us closer to creation of a full-format information base for development of logistics services and, correspondingly, growth of attractiveness of railway transport in the country.*

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