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LOGISTIC MANAGEMENT BY FREIGHT TRAFFICS OF CONTIGUOUS TYPES OF TRANSPORT

Summary. The results of investigation of interaction of two contiguous types of sea and railway transport are presented by means of the method of factor-by-factor analysis. Logistic system of management by the freight and wagon traffics is offered, which will allow considerably to shorten time of transfer of freight units from one type of transport to another.

ЛОГИСТИЧЕСКОЕ УПРАВЛЕНИЕ ГРУЗОПОТОКАМИ СМЕЖНЫХ ВИДОВ ТРАНСПОРТА

Аннотация. Приведены результаты исследования взаимодействия двух смежных видов транспорта морского и железнодорожного с помощью метода пофакторного анализа. Предложена логистическая система управления грузопотоками и вагонопотоками, которая позволит значительно сократить время передачи грузовых единиц с одного вида транспорта на другой.

1. PROBLEMS OF INTERMODALITY OF CONTIGUOUS TYPES OF TRANSPORT

The Ukrainian railways are interacting with marine ports which lately have a tendency for development and expansion. In the conditions of growing freight traffics, going in the ports, it is necessary to find the new technical, technological, organizational decisions of nascent problems. In this connection there is a problem, related to co-operation of two contiguous types of transport.

Transport systems of Ukraine endure hard times. On one side, Ukraine aims to take a deserving place in world economic space and from the other – the economy of Ukraine did not attain stability of high level, which considerably influences on the export, import and transit through ports of the country. Actuality is conditioned that the European Union is a powerful foreign trade partner for Ukraine. The volume of foreign trade operations in Ukraine increases all of time. So, from data of State Statistic Committee, as compared to 2007 the export has increased from 35.9%, import to 41%. It is a positive factor, but for complete objectivity it is necessary to take into account some moments. For example, depression of economic activity in the period of world crisis, changes of production of large industrial enterprises (main suppliers of mass products to ports) and their reorientation on other sources of providing with raw material and sale of products, all of it requires universality of ports. Therefore, the improved approaches are needed to the management by the variable freight traffics in modern conditions.

The purpose of this article is investigation of interaction of two contiguous types of sea and railway transport by means of the method of factor-by-factor analysis, allowing to produce organization of carriage process by the logistic system of freight traffics management. Temporal characteristics affect the question of principal distinction of work of railway and sea transport again. The interval between vessels arrival in port is greater by several fold the interval between trains. Thus it is necessary to take into account the circumstance that work of railway transport in less degree is subject to influence of natural cataclysms, and this type of transport is not seasonal. So, functioning of sea transport has probabilistic character.

At intermodality of contiguous types of transport the productivity of every participant of the mixed transportations has played .an important role. If port processes the certain amount of freight, the port station cannot manage with the growing freight traffic. As a result large numbers of trains are accumulated on the station approaches with freights, going in an address of port. Therefore it becomes obvious, that the production capacities of port and station must be developed in parallels. Otherwise both participants of the mixed transportations will bear losses. Losses which port and railway can bear in days can make accordingly about $20-25 thousands and $5-6 thousands for one train from 57 cars [1].

The intermodality of two contiguous types of transport can be investigated by the method of factor-by-factor analysis.

2. METHOD OF FAKTOR-BY-FAKTOR ANALYSIS OF INTERACTION OF CONTIGUOUS TYPES OF TRANSPORT

Among the great amount of aspects of port - station co-operation it is possible to select a few basic factors, such as a transmission of freight traffic [2-4], exchange of messages and information, charts of placing of port and station, spatial placing of equipment and others. The factor of freight traffic transmission was considered in the work [1]. We will study the factors of traffic of messages and information and charts of placing of port and station.

The factor of traffic of messages is closely related to the factor of transmission of freight traffic. The informative stream is preceded material one, accompanies it and operates already after realization of transportation directly on the stage of management and analysis. The following aspects influence on exchange of messages and information: volume of information, types of information, hardware components, and documents, speed of transmission, timeliness, authenticity and legal relations.

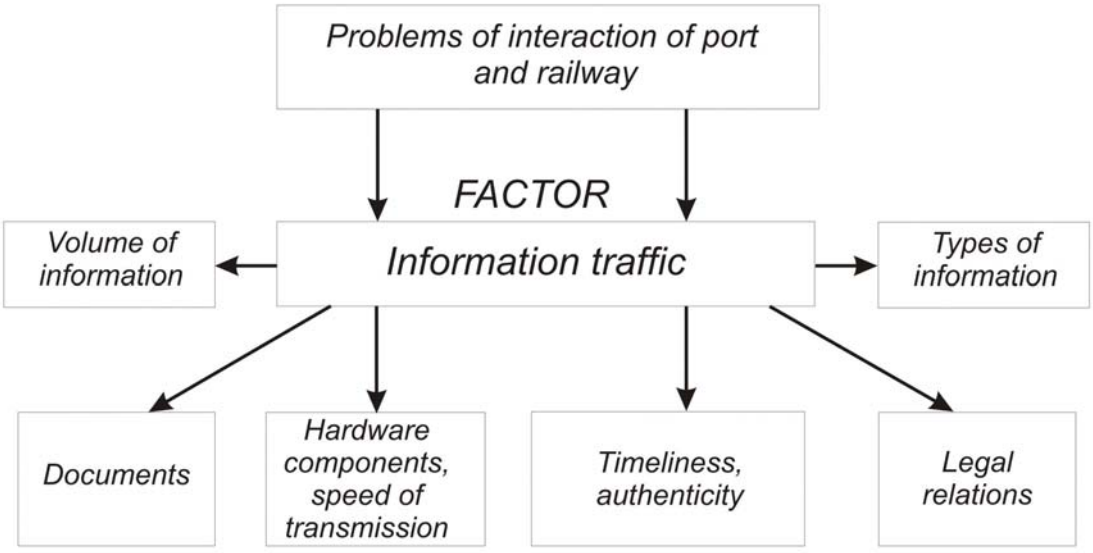

Fig. 1. Classification of aspects of interaction of port and station on the basis of factor-by-factor analysis
Рис. 1. Классификация аспектов взаимодействия порта и станции на основе пофакторного анализа

In the conditions of growth of freight traffics (especially on a joint of railway station-port) increase of the volume of information is becoming obvious. In this connection there is a problem of transmission and processing of informative streams. Today with the type and form of exchange of messages and information it is possible to evaluate the carrier about the level of being equipped, about his competitiveness in the market of transport services. Hardware components on the transmission and processing of information are constantly perfected and require regular updating. New technologies of information transmission do not allow fully to refuse the documents on the transported freights. Chart of documentation turn-over between port and station at the transfer of freights from water to the railway is difficult enough. The documents, accompanying freight from a railway station, are carriage sheet, railway memorandum bill and waybill (invoice). Collation of documents in port is made by means of a model sheet and the transmission of documents is directed in a commodity office, where the freight is accepted from a railway. Freight transmission to the water-carriage transport and vice versa is carried out with bill of lading (invoices), which are accompanied with plenty of documents and finished with drafting of report and their passing in an archive.

Speed of information passing, timeliness and its authenticity play an important role at information transmission, as well as at the transmission of freight traffics. In order to improve these indexes the informatively-logistic centers are created. The basic task of such centers is creation of united informative space for the participants of the mixed transportations. Legal providing accompanies both transfer of freight traffic and information transition always. There can be difficulties with custom registration and formation of request on transportation.

And now we will consider the factor of chart of placing of port and station.

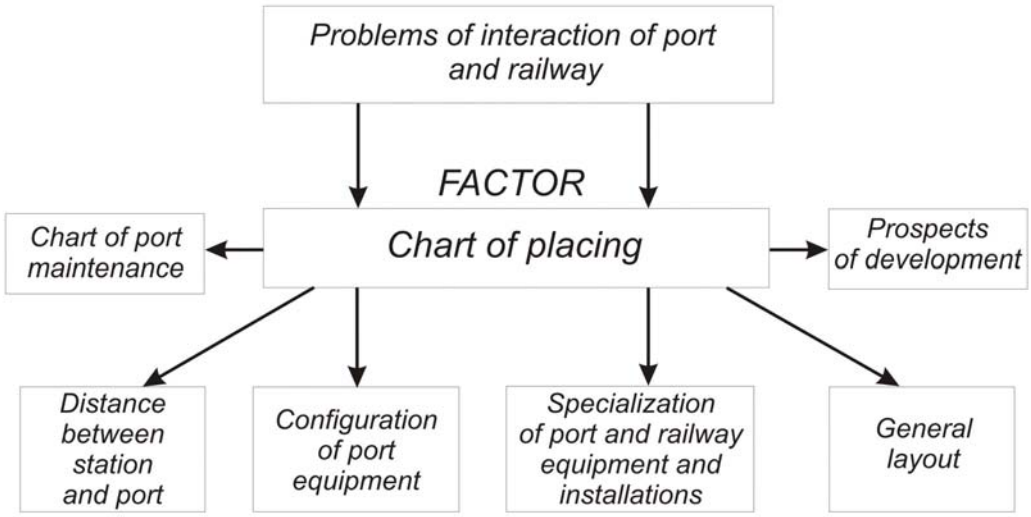

Fig. 2. Classification of aspects of interaction of port and station on the basis of factor-by-factor analysis
Рис. 2. Классификация аспектов взаимодействия порта и станции на основе пофакторного анализа

The under-port stations of general trackage, special port stations or district parks on port territory are usually used for maintenance of marine and river ports at the transfer of freights from railway on a water-carriage transport and backwards [4].

For pre-election of chart of maintenance of port with the number of wharfs no less than four and at the distance between port and marshalling (sorting) yard up to 20 km it is necessary to apply a system of maintenance of port directly from under-port marshalling yard. Choosing the chart of maintenance, it is necessary to take into account that maintenance of port is the most expedient to carry out from district parks at the number of wharfs four and more and at the distance between port and marshalling yard to 7-8 km and volume of freight turnover to 10 million tons a year. It is most efficient to service the port from the port station at distance of 13 km and more, and at 15 million tons a year and more. The port stations are assumed to arrange only as an exception in the case of the concentrated placing of wharfs and at impossibility of arrangement of district parks on the local terms.

The port stations execute works on organization of interacting with the under-port station and on sorting of cars on separate loading-unloading fronts (to wharfs, to storages). The tracks with the proper equipment are chosen at the port station for volumes of this work (extractions, gravity humps of low power and so on).

Main purpose of district parks of port is to approach railway cars to wharfs and storages, prepared to service loading-unloading fronts. In district parks, as a rule, the complete or partial sorting of cars is carried out also on wharfs and holds of vessels. The district parks can have reception-dispatching and sorting tracks depending on the volume of work. The chart of the port station and district parks is distinguished by the mutual location of tracks and subdivided into the station (district parks) with the successive location of tracks of reception and sorting, combined and parallel location of parks.

Depending on the accepted system of maintenance the district parks can be used for a feed of cars, which are gathered together in a group, to fronts, or for the selection of cars for successive feed to fronts of loading-unloading. The sorting extractions for processing of cars are provided, as a rule, in the district parks. The type of sorting equipment at the large volume of processing of cars is set at the concrete planning.

The ports on configuration of berthages are distinguished with pier wharfs, with wharfs-embankments, with the combined wharfs.

In Ukrainian ports wharfs are more frequent adjusted for the overload of separate types of cargoes. Wharfs and wharf storehouses can have the following specialization:

wharfs for the transfer of piece freights;
wharfs for the transfer of timber cargoes;
wharfs for the transfer of bulk and corn cargoes;
wharfs for the transfer of liquid cargoes (without a container).

The type of freight and freight operations influences at choice of type of storehouses, ware-house equipment and loading-unloading technique. Technology of loading-unloading works can be executed with the use of area of storage or by the transfer on a direct variant. In practice simultaneous feed of vessels and cars to marine and railway freight fronts is hardly realizable. Therefore the variant of the transfer of freight with the use of area of storage is presented more rational.

Thus far the not complete enumerated list of problems of the contiguous types of transport can exist not independently, but in close intercommunication. So, the track-ground development of the under-port station is determined by the chart of maintenance of port, volume of freight turnover and distance to the pre-port marshalling yard. The loading-unloading sorting tracks in ports are made directly at the line of wharf front or at storehouses. The carrying capacity of these tracks must provide the uninterrupted transfer of freights from the railway on a ship and backwards without the demurrage of rolling stock.

3. THE LOGISTIC SYSTEM OF MANAGEMENT BY FREIGHT TRAFFICS

Freight traffic on the mixed type is carried out by two plans: to the plan of transportations and plan of transfer of freights. Non-fulfillment of plan of transportations stipulates non-fulfillment of plan of transfer of freights. Transport organizations of point of transfer -railway and port- bear responsibility for non-fulfillment of plan of transfer of freights, and transport organizations of point of departure and consignees -for non-fulfillment of plan of transportations. So, development of the logistic system of management by the freight and car traffics is needed for the concerted implementation of these two plans and improvement of co-operation of sea and railway transport

The principal aims of creation of the logistic system of management by freight and car traffics are the following:

providing the free passing of freights through butt points;
optimization of transportation process with participation of a few types of transport;
an acceleration of traffic of foreign trade freights;
the maximal use of existent possibilities of all of types of transport (transport intermodality), in particularly, conditioning the full use of possibilities of ports of Ukraine;

expanding of additional freight traffics in transport corridors which are passing on territory of Ukraine.

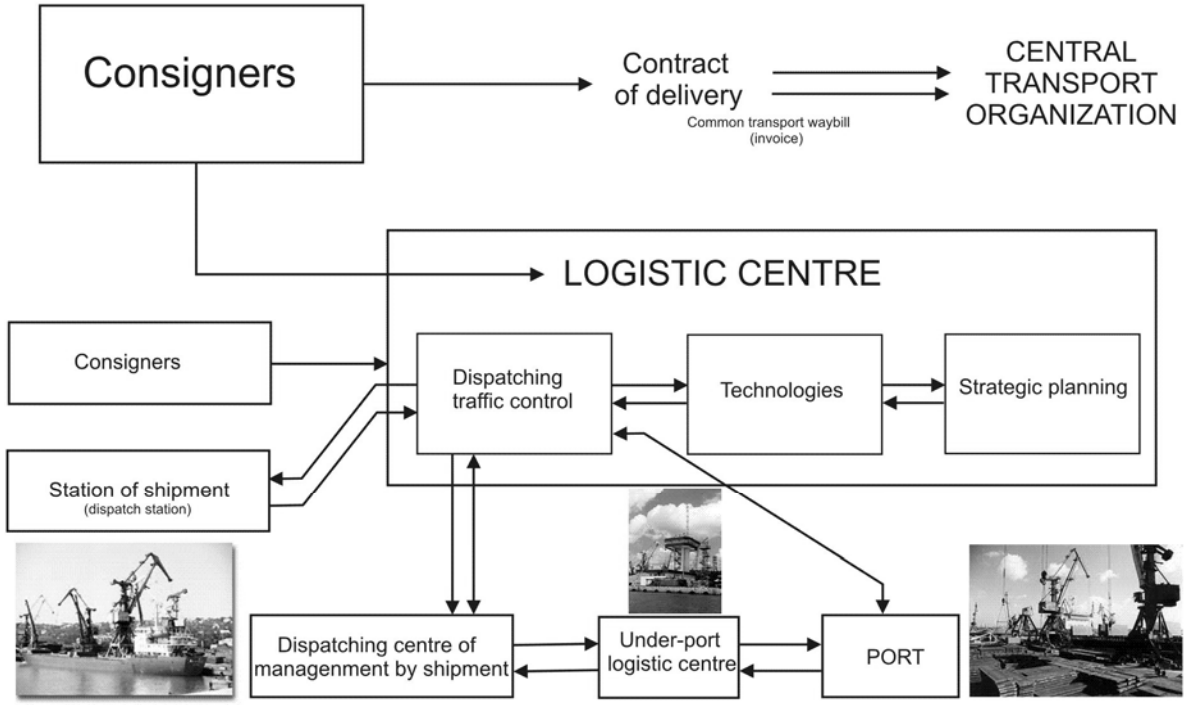

Fig. 3. The logistic system of management by freight traffics
Рис. 3. Логистическая система управления грузопотоками

Achievement of these aims must reduce the expenses of freight- owners on transportation of freights, to decrease a transport constituent in the cost of products, to raise profitability and stability of functioning of the transport complex of Ukraine. Technology of logistic management by freight and car traffics must be grounded on principles of concentration of dispatching control with the use of complex of the mutually communicated automated systems, technologies and strategic planning. Hence, creation of under-port logistic centers is needed to improve interaction of sea and railway transport. Cardinal preconditions for creation of such centers are:

the united vertical of management;
powerful informative base;
the united technological processes of co-operation of ports;
scientific base on preparation of specialists;
the experience of intermodality of different types of transport;
new informative systems and legal base.

4. CONCLUSIONS

The creation of the logistic system of management by freight and car traffics will allow:

1. Considerably to shorten time of transfer of freight units from one type of transport on other, rationally to use existent and designed powers of infrastructure of all of types of transport, to extend the list of services, used at freights transportation accordingly to modern requirements, – «from a door to door» and «exactly in time».
2. To accelerate the process of the account for transportations and additional services, to shorten expenses on development of electronic document turnover on every type of transport separately, to decrease expenses, related to paper documentation processing.

3. To accelerate the document turnover on the border-line stations, to shorten time of custom, certification and other procedures due to the preliminary preparation and presenting the transportation documents on freights, and to raise quality of executed services to international level.
4. Logistic centers will be able to provide the united technological process of work of the transport point not only from positions of transport intermodality, but also co-operation of organs of state management, custom, border-line, veterinary, sanitary-epidemiological and other services, accompanying transportations

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