Trends of transport logistics in construction in the conditions of digitalization

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Abstract. The top trends, peculiar to transport logistics in the construction companies activity, are pointed out in the article. According to the results of the analysis that was carried out, nowadays digitalization is the main subject in logistics. In particular, paperless registration of cargo transportation, robotization during freight processing, the use of unmanned vehicles for transportation, and the introduction of obligatory marking for separate types of commodities are revealed. The authors find out the logical communication between the development of electronic commerce and the adaptation of logistics for it, and conclude, that only the complex logistics will be able to conform to modern requirements. At the same, some factors which slow down the digitalization of the transport-logistic sphere in Russia are revealed. This will also make it difficult for the companies to cope with the peak loads by their capacities. So, logistic outsourcing can become the solution to this problem. The results of the analysis as well as the conclusions, drawn by the authors, can be useful for the further development of the transport-logistic complex.

1 Introduction

It is proved, that in the modern economic conditions the enterprise spend from 5 to 35% of the total amount of expenses for logistics, depending on type of business, geographical scale of activity and other indicators. As for the construction organizations, logistic costs make 30–34% in this industry. The field of logistics covers practically all the spheres of production at each enterprise:

- control of transport, warehouse economy, stocks, personnel;
- information support;
- commercial activity, etc.

The purpose of the construction companies management consists in the development of the uniform logistics chain for the purpose of the increase in the overall performance, as well as the reduction of terms of works, the decrease in manufacturing costs and improving the competitiveness of products.

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Having pointed out the priority industries with the greatest logistic attractiveness (including construction), we can evaluate the trends which developed within logistics in modern conditions [1].

The main thing that characterizes today's market of logistics is its unconditional digitalization. According to the expert «RBC. Market Research», in 2020 58% of the Russian transport companies used various instruments of automation for the reorganization of personnel management, planning, financial and warehouse accounting, control of fuel consumption, and so on. According to the survey conducted by the Institute of statistical research and knowledge economics of Higher School of Economics, the demand of the transport-and-logistic industry for advanced digital technologies was 89.4 billion rubles in 2020 and can grow to 626.6 billion rubles by 2030. The average annual growth rate is expected to be 21% (according to Higher School of Economics). The overall performance in the industry will increase by 20% by 2030 thanks to the digital transformation, according to Cnews Internet portal.

Accelerated digitalization of logistics is the forced answer to a pandemic in many respects [2]. Having evaluated its advantages, the leading logistic companies have already automated more than 60% of their operations. However, the Russian branch of logistics still lags behind the leading countries of the world considerably in this direction. The domestic companies have to solve the problem of integration of digital technologies into all the stages of the logistic process. Unification and standardization of forms of the electronic document management, when forming business logistic connections at the international level takes the important place. Other difficulties at the digitalization problem include territorial heterogeneity of Russia, insufficiently developed transport infrastructure in many regions, weak data security, as well as the absence of skilled staff, which could not only introduce similar systems of digital data in the logistics chain of the enterprise, but also operate them competently. Therefore, the situation demands closer research.

2 Methods and materials


The objective of this research is the identification of the main trends in the transport-and-logistic activity development in the current pandemic conditions, taking into account the reference point on digitalization of all the branches of the economy, as well as the identification of the obstacle of faster and more effective digitalization of this sphere.

Within this research, the analytical materials of the Logirus company, forecasts of Avtodor Group specialists, the results of "RBC Market research" expert poll, the reports of Higher School of Economics, state-of-the-art reviews of CNews Internet portal, the passports of state infrastructure project "Smart City" and the national project "Safe and Qualitative Highways" were studied. The prototype of the state information system, developed by Federal State Unitary Enterprise ZashchitaInfoTrans, was studied.

Generalization and systematization of scientific and statistical data, their comparative analysis, synthesis, application of the system approach, data processing with the use of the economic analysis methods, and the general theory of statistics served as the main methods of the research.
3 Results
The analysis of the available experience proves that the electronic document flow is a good reserve for the decrease in the cost of transportation. It is possible to lower single runs by 5% thanks to its use because it is not necessary to stop by at the motor transportation enterprises for traveling and transportation documentation delivery (according to Cnews).

The companies, introducing electronic document flow, obtain the following advantages:

- saving of time on filling, processing, file transfer up to 70%
- cost reduction on office and delivery
- providing an overall performance due to optimization of processes
- increase in the speed of decision-making in management
- growth of employees efficiency at the expense of the convenient and transparent system
- exception of the human factor, damage/losses/thefts
- development of electronic corporate culture

It is necessary to consider that the updated Rules of goods transportation by motor transport have become effective in the territory of the Russian Federation since January 1, 2021. This document also establishes the possibility of implementation of cargo transportation with the use of digital waybills and consignment notes. The transition to ecosystems that should increase safety on the road considerably is predicted within this course towards digitalization and automation.

Services of logistic business will develop according to the principle of ecosystems. The available resources are analyzed by them and a driver and a vehicle are appointed, confirmation of operation is received with the help of the simple digital signature, the task to the driver, the electronic consignment note, and the electronic waybill are formed. The optimum route is created on this basis, the necessary limit of fuel and filling complexes with the optimum cost of gasoline is calculated. The systems allowing us to monitor cargo transfer have been improved, interaction with carriers, control of fuel consumption, and the manner of...
The companies, which have introduced this system within the stage of testing of the Russian BaseTracK Logistics SF technology, already could achieve fuel economy on average up to 10% from one run. And the interaction between a warehouse and transport improved by 10% by the means of the Control Centre of Transportations system, the decrease in the cost of transportation was 2% due to online monitoring of each run. The underload, time spent on materials handling, and delays in delivery decrease.

Robotization can become one more direction of automation and digitalization in logistics. Robotization of freight processing in logistics has its specifics. The matter is that heterogeneous freights are usually processed in the logistic centers. Robots do not cope with their processing at the moment. Therefore, the nearest future of logistics is connected not with classical program robots (RPA), but with digital platforms based on algorithms. Classical RPAs are ground on sample actions and it is almost impossible to arrange them for external changes, but the digital format us to make that happen. Specialists of the industry succeeded to automate the contact center, the control of the loading-unloading equipment, and even a part of administrative processes of the company. The platform`s decision allowed us to save up to 30% of expenses thanks to the improvement of processes in the contact center, to reduce distances and time of transportation by up 25%, idle times by 20%, and expenses by 10%. Thus, the digitalization of logistic processes provides a real economy even at the initial stage.

The following logistic trend is the use of unmanned vehicles in the real transportation process. The trial operation of these highly-automated means is already conducted as it is an authorized resolution of the Government of the Russian Federation No. 1415. In 2020 several sign tests of self-driving cars on public roads took place. So, the low-tonnage vehicle EVO-1 of the Evokargo company was tested on one of the sites of the Central Ring Road in November 2020. The machine moved in active interaction with the connected elements of road infrastructure and the system of "smart road" under the safety protocol. Running of unmanned vehicles will become possible during their work in the conditions of negative temperatures, poor visibility, traffic jams, and intense capital traffic. At the same time, commercial operation of unmanned motor transport has already begun in the closed territories. So, the project on the introduction of service of transportation of freights by the unmanned EVO-1 vehicles (electric unmanned platforms) in the logistic transit center Butovo has begun since January 2021. Unmanned vehicles will be able to make about 1,000 runs a month across the territory of the hub, moving freight with a total weight of up to 1.5 tons.

According to the present rates of development of infrastructure for unmanned vehicles, 10-20% of freights in Russia will be transported by autonomous vehicles by 2030. Mass use of unmanned vehicles in the closed territories will most likely begin in several years. Territories of allocating centres and logistic hubs are suitable for these purposes most of all.

The next factor, which will define and adjust logistics, is the introduction of obligatory marking for separate types of goods. Requirements for the marking of goods and the growing requests for delivery of small consignments increase the volumes of warehouse services during import freight transportation. But this volume of work substantially passes by the Russian warehouses as it is more convenient to be engaged in the consolidation of combined freights and marking of goods outside the Russian Federation. While the operating precepts of law in the Russian Federation...
4 Discussion

The division of logistics into transport and warehouse, transportation and storage is conditional. Only the uniform, complex logistics will be able to provide the goods delivery in time precisely. At the same time, the violation of supply chains because of various quarantine restrictions will most likely become the driver of growth for logistic outsourcing [16]. Besides, the representatives of the transport and logistic industry also name the following problems, which are slowing down the industry's digitalization:

- lack of digital culture and training, which is the problem, named most often [17];
- not resolved questions of protection and confidentiality of data [18];
- high requirements for financial investments;
- lack of accurate vision of digital operations and support from top management [19];
- insufficient experience and skills;
- slow distribution of the main infrastructure technologies [20];
- impossibility of business partners to cooperate with digital decisions;
- unclear economic benefit of digital investments;
- lack of digital standards, norms, and certification;
- anxiety, concerning the loss of control over the intellectual property of the company [14].

5 Conclusion

Summing up the analysis of the situation with domestic logistics, it is possible to notice the paradoxical fact, that the pandemic of 2020 caused a positive trend, i.e. the accelerated digitalization of logistics. However, the Russian branch of logistics still considerably lags behind the leading countries of the world in this direction. The lag is caused by several factors, first of all, by the lack of digital culture and appropriate training of employees in the digital format work. The main trends in the industry also include: transition to paperless registration of cargo transportation, robotization of processing freights, use of unmanned vehicles during transportation, introduction of obligatory marking for separate types of goods.

Though each segment of the transport-logistic complex has its specifics, the noted trends have a general character. Nowadays, they are inherent in the whole transport-logistic complex of Russia to some extent. In turn, the development of transport logistics will allow construction companies to plan and carry out works, to finish them in the shortest terms, to increase the activity efficiency and the competitiveness of products.

The full-scale introduction of "digital logistics" in the construction sphere is a long process which will last the next decade at least. The development is possible thanks to the transition to electronic document management in the transport-logistic companies. However, we should note the fact, that there is a problem of opacity of the state bodies activity and also their unavailability to such a transition in the technical aspect [21]. Many transactions still demand physical presence and they are carried out manually. That slows down the development of the transport-logistic industry in Russia and increases the lag from other countries.
Introduction of digital systems, and for training of specialists as...

References