European Journal of Agricultural and Rural Education (EJARE)
Available Online at: https://www.scholarzest.com
Vol. 5 No. 10 October 2024
ISSN: 2660-5643

INCREASING THE EFFICIENCY OF MANAGEMENT OF THE TRANSPORT-LOGISTICS SYSTEM

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Article history:

Received: 6th July 2024
Accepted: 4th August 2024

Abstract:

There are introduced using of a method of proactive management in management of transport-logistical system, applied principles of logistical engineering on efficient control of an infrastructure, the organization of difficult organizational-technical objects, modern management methods transport-logistical system in the article.

Keywords: transport and logistics system, logistics engineering, complex organizational and technical object, digital logistics, proactive (preventive) management.

INTRODUCTION. The importance of transport infrastructure is increasing in the processes of globalization taking place in the world. The task of improving the activities of this sector is carried out by the global transport and logistic system. According to the data of the World Bank Group, the amount of world transport services in GDP is 4.2 trillion. It is estimated at 110 billion USD per year (6.8%). tons of cargo and 1 trillion. more than 100 million passengers are transported, the number of employees employed in the transport infrastructure is 100 million. constitutes a person [1]. Issues of creation and implementation of modern transport-logistics infrastructure, consisting of transport-logistics centers (TLS) and complexes that ensure free access of products to Uzbekistan and foreign markets, are becoming important issues for the modern stage of development of the transport complex of Uzbekistan, first of all, the railway complex.

These economic reforms are mentioned in the third item "Priority directions of economic development and liberalization" of the "Strategy of actions on the five priority directions of the development of the Republic of Uzbekistan in 2017-2021" in our country as deepening structural changes, increasing its competitiveness due to the modernization and diversification of the leading sectors of the national economy. [2].

In the 21st century, the formation of the state innovation system and the models of their use are developing as complex organizational and technical objects designed for the integration of enterprises on the basis of flexible information technologies and highly efficient supply chains. From this point of view, the issue of interaction with various sectors of the economy is urgent in the field of improving management efficiency and ensuring its stable operation in front of the transport system of Uzbekistan, its infrastructure, multimodal transportation system.

ANALYSIS OF LITERATURE ON THE TOPIC. A number of scientists who studied the effective management of transport-logistics infrastructure, its content and impact on other sectors of the economy expressed different opinions on the management of transport-logistics infrastructure.

D. According to Bauer sox, he paid special attention to the problems of multimodal and intermodal freight transportation, including the advantages and economic efficiency of the organization of freight transportation compared to traditional methods. At the same time, the author specifically notes the transport-logistics infrastructure, which includes transport networks, vehicles and transport companies [3].

A.L. Nosov, the problems of organization and optimal functioning of international transport-logistics systems in the current conditions are studied. The prospects for the development of mixed cargo transportation, showing directions for improving the organization of mixed foreign trade transportation in international traffic, are emphasized [4].

S.M. Reser, in his work, models and problems of management of regional transport systems in the context of changes were considered. In the country's production and transport system, he has fully analyzed the methods of interaction of transport types, the methodology of forecasting the market of transport works and the principles of planning of loading works in highway transport [5].

Taking into account the above points, it is possible to develop the infrastructure by considering the problems of economic-technological feasibility assessment, which includes the identification of the needs for the development of transport-logistics infrastructure, theoretical aspects in the management of transport-logistics activities, and the use of modern management methods to increase the efficiency of management.

In order to effectively manage the railway transport activity and transport-logistics system in our country, to solve the problems in this process, we analyzed the index of logistics indicators of developed countries, modern methods of managing the transport-logistics infrastructure, and through the methods of comparison, analysis and synthesis, we presented the directions of their development.

Multimodal and intermodal cargo delivery systems create new opportunities for the development of logistics services and the integration of various participants in the transportation of cargo. The need for logistics technologies and high-speed transportation systems to serve shippers and consignees is becoming a major driving force in global transportation systems. This, of course, increases the level of complexity of organizational and technical facilities. Also, integration processes are aimed at increasing the level of implementation of logistics processes, which is reflected in improving the level of customer service, reducing overall costs and systemic risks. The application of logistics engineering principles is considered as one of the important conditions for improving the efficiency of integrated supply chains.

The formation of a multimodal TLC network at the entrance to large transport links and large industrial clusters allows to attract additional cargo flows, increase the competitiveness of cargo transportation by rail and other types of transport, and develop high-income services in the field of complex logistics. These routes will help Uzbekistan join the world transport system in ensuring national security and sustainable development.

Delivery of cargo and passengers to the destination in transportation is characterized by the uniqueness of life cycle processes. Disparate transportation, production and distribution systems are not sufficiently interconnected, which causes a decrease in the efficiency, quality and reliability of transport services, which is especially reflected in the operation of supply chains, including their infrastructure. For example, in recent years, the volume of transportation in railway transport has increased, while there is also the risk of losses from the use of production assets (rolling stock, containers) (tabl.1).

Table 1
Cargo turnover and cargo transportation by types of transport in 2019-2024[1]

2019			2020		2022		2023		2024	
Name	mln.t.	mlrd. t-km	mln.t.	mlrd. t-km	mln.t.	mlrd. t-km	mln.t.	mlrd. t-km	mln.t.	mlrd. t-km
Including by transport										
Railway trvnsport	61,5	22,7	63,7	22,8	65,7	22,9	67,2	22,9	67,6	23
Car transport	1203,2	27,5	1258,3	29,2	1327,4	31,5	1399,8	33,9	1473,7	36,0
Pipelines	64,5	33,0	65,0	31,5	65,8	31,2	60,0	30,0	62,2	28,9
Air transport	24,0	121, 9	22,2	116,3	23,0	125,1	24,6	131,1	26,5	132,2
Result	**1329,3**	**83,4**	**1387,1**	**83,7**	**1458,9**	**85,7**	**1527,0**	**86,9**	**1603**	**88,0**

According to the dynamics of cargo transportation volume described in Table 1, in 2012-2016, the share of railway transport in the total cargo turnover of the country's transport system was kept stable at the level of 25-26%.

As a result of the measures taken, the volume of cargo transportation in 2016 increased by 5.0% compared to the previous year, including by 5.3% in road transport and 8.8% in air transport. The volume of freight traffic is 91172.6 million ton-km, the highest share in the total volume of freight traffic is road transport (39.4%), pipeline transport (35.0%) and railway transport (25.4%) coming right.

[1] *Source: Information of the State Statistics Committee of the Republic of Uzbekistan.*

Taking into account the prospects for the development of the economy of Uzbekistan and the development of other types of transport, it is assumed that the growth of railway transport will be an average of 5 or 2.3 percent annually, from 83.7 million tons in 2016 to 146 million tons in 2030 [6].

According to estimates, a 1% increase in investments in the transport sector will provide a 0.94% increase in freight volume. Along with improving the quality of services and ensuring further diversification of transport routes for transportation, it should be aimed at optimizing the management of the transport logistics system aimed at the consumer.

Reducing the share of transport costs in the cost of products is one of the most important tasks, because the increase in transport costs in the cost of industrial products has a direct impact on the competitiveness of our country's goods. The cost of domestic freight services, like the cost of international freight services (including transit services), remains relatively high and has been increasing rapidly in recent years.

High freight rates are also typical of the railway sector. In particular, a comparative analysis of prices shows that producers in Uzbekistan pay $5.15 to railwaymen for transportation of cargo (60 tons of textile products) in 1 standard wagon over a distance of 500 kilometers. In Kazakhstan, this figure is 0.93 US dollars, in Kyrgyzstan it is 2.65 US dollars, in Tajikistan it is 6.83 US dollars, in Turkmenistan it is 2.65 US dollars. In Uzbekistan, shippers pay 2.51 US dollars, 0.68 US dollars in Kazakhstan, 2.60 US dollars in Turkmenistan [7].

The logistics system is characterized by the fragmentation of the supply chain, the excess of loading and unloading links from the supplier to the receiver, which leads to an increase in the costs of transport and logistics services of manufacturers. This is due to the slow development of transport and logistics companies and related infrastructure. The main part of transport and logistics operations in the country takes place in the format of 1PL and 2PL, only some companies provide limited services in the format of 3PL. There is a lack of large operators capable of establishing effective cooperation between road, rail and air transport.

The main restrictions on increasing the volume of cargo transportation are:

- *insufficient development of the transport-logistics system;*
- *the rate of development of the road network significantly lags behind the rate of automobileization of the society;*
- *insufficient development of export transport infrastructure (border checkpoints);*
- *availability of limited capacity of railway companies;*
- *unjustifiably high cost of aviation fuel.*

In large transport links, the network of multimodal terminal logistics centers (TLC) on the railway network of Uzbekistan is observed to be underdeveloped. As a result, in particular, it is impossible to ensure the distribution of cargo flows in the transport infrastructure due to the speed of container turnover, as well as the many freight connections and different types of transport [8].

As mentioned above, logistics engineering is one of the ways to increase the efficiency of organization and management of transport-logistics systems (TLS). Not all processes are used in logistics engineering of individual projects or to organize projects within the framework of infrastructure, but the principle of "many-to-many" integration is used. As an example, the transportation process can be considered in a direct supply chain connecting the producer, TLC and the consumer.

Such a supply chain fully meets the requirements of technological integrity, which is very important to determine the impact of transport activity-specific processes on the result that occurs at the end of the chain. Technological integrity is achieved by combining intermediate links in such a way that the product "leaves" at one link and simultaneously "leaves" at another in a reasonable amount of time spent on transportation (tabl.2).

Table 2

The main indicators of the socio-economic development of the Republic of Uzbekistan (January-December 2023)

Specification	Unit of measurement	January-December	Composition, in %		Compared to january-december last year, in %	
			2022	2023	2022	2023
1. Gross domestic product, including total: net net net net value-added taxes on products	mlrd. soum	**1 066 569,0**	**x**	**x**	**105,7**	**106,0**
2. Gross value added of networks		**1 008 423,1**	**100,0**	**100,0**	**106,3**	**105,9**
Village, forest and fish farming		**245 222,5**	**24,9**	**24,3**	**103,6**	**104,1**
Industry (including construction) including:		**325 378,4**	**33,5**	**32,3**	**105,6**	**106,1**
industry,		262 824,2	27,0	26,1	105,3	106,0
construction		62 554,2	6,5	6,2	106,6	106,4
Services		**437 822,2**	**41,6**	**43,4**	**108,7**	**106,8**
3. Agriculture, forestry and fisheries		**426264,0**	**100,0**	**100,0**	**103,6**	**104,1**

Specification	Unit of measurement	January-December	Composition, in %		Compared to january-december last year, in %	
			2022	2023	2022	2023
Farming and animal husbandry, hunting and services provided in these areas		411594,6	96,5	96,6	103,6	104,1
- Forestry		10399,5	2,6	2,4	101,7	102,7
- Fisheries		4269,9	0,9	1,0	106,4	107,4
9. Transport:						
- cargo turnover;		76,8	x	x	100,9	101,8
- passenger turnover.		152,7	x	x	106,9	104,2
10. Retail trade turnover		**326 160,1**	**x**	**x**	**110,8**	**109,1**
11. Ташқи савдо айланмаси:		**62 567,4**	**100,0**	**100,0**	**119,8**	**123,9**
- export		24 426,2	39,1	39,0	118,4	123,8
- import		38 141,2	60,9	61,0	120,6	124,0
12. Permanent population (for the interim period)		**36412,4**	**x**	**x**	**102,1**	**102,1**
of which:						
working age	thousand people	20608,1	57,2	56,6	100,8	101,1
13. Average nominal calculated salary[1)]	thousand s.	**4 551,4**	**x**	**x**	**120,8**	**117,2**
14. Inflation rate:						
- average monthly growth rate.	%	0,7	x	x	x	x
- compared to December last year.	%	8,8	x	x	x	x

Source: Information-analytical newsletter, 2019. It can be seen from the given data that the growth of per capita income has positive dynamics, this indicator increased by 2.63 times in 2009 compared to 2000, which undoubtedly shows the increase in the standard of living of the population. At the same time, this indicator is not without a number of shortcomings. By 2019, a decrease in GDP indicators compared to 2009 and a significant increase in the population led to a decrease in GDP per capita. In particular, it contains a number of items related to taxes and other payments, such payments have a large weight in GDP. We think that one of the ways out of this situation may be to replace these indicators with the production of national income per capita (at constant prices), which is widely known to many.

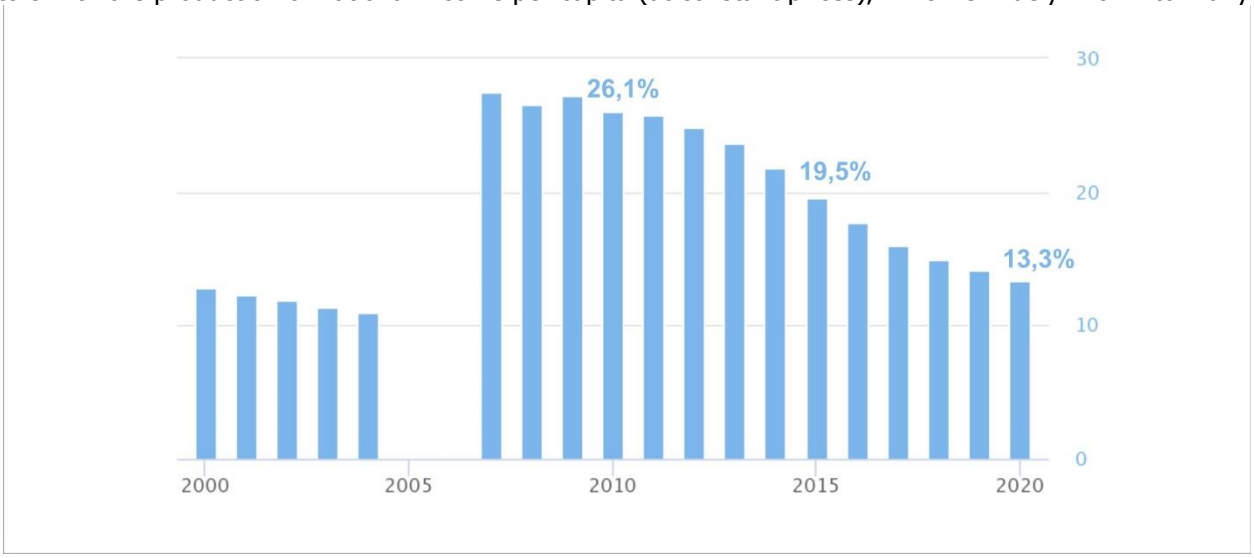

Fig.1. Poverty level in Uzbekistan.[2]

This indicator plays an extremely important role in determining the level of well-being. Such calculations (although, in our opinion, they are quite productive from the point of view of this problem) have not been carried out

[1)] *Except for agricultural enterprises and small business entities, subject to assessment.*

[2] *2020 Voluntary National Review - Implementation of the 2030 Agenda for Sustainable Development.*

so far, so they are not used in this work. In addition, we think that the part of the national income directed to final consumption should be used in the assessment of the standard of living.

Transport acts as a conveyor in this case, it completes the continuous technology process and provides service to all supply chains. But such an approach requires modern information, mathematics and software that allows to evaluate the entire transport process. Based on the information exchange diagram, an approach to shipping, receiving, TLC and freight transportation processes, the standard for electronic information exchange in management, commerce and transportation, it is considered as a mobile technology bridge in "digital logistics".

Modern economic conditions require replacing traditional (functional) logistics processes with flexible methods that model the supply chain in order to optimize production, warehouses, customer placement and costs and order fulfillment periods. A new firm approach is required not only in the supply chain, but also in the individual enterprise based on the logistics mechanism of integrated management in intellectual and Internet technologies (such as the "Internet of Things"). Nowadays, it is difficult to imagine modern production and service systems, which are part of international corporations and holdings, distributed across regions, that are not integrated into the transport-logistics system. The systems, tools and complexes in use often have characteristics such as multifurcations, uncertainty in implementation, hierarchy, redundancy of elements and relationships, multivariate execution of tasks and processes, and a set of components.

In the current environment, life-cycle infrastructure can help create conditions for innovative development, creating demand for robotic loading-transport equipment and modern efficient technological solutions, including in the field of international engineering and transport construction. For example, it is difficult to imagine the implementation of the principle of a systematic approach without the use of logistics engineering technologies in the field of warehouse operations in railway transport and commercial use [9].

It should be remembered that due to the lack of resources (arising from different subjective and objective principles), it will not be possible to maintain the required level of performance of modern organizational and technical facilities, which should be intended for use in the event of malfunctions, accidents, and even disasters, therefore, they are not viable (provided with the property of crash tolerance in a broader sense. For this, it is possible to recommend new processes of proactive (warning) management, which are carried out with targeted procedures for changing the structure of organizational and technical objects and provide a comprehensive forecast of system activity and increase the level of its performance based on large-scale electronic data [10].

In the practice of proactive (warning) management of the infrastructure of organizational and technical facilities, in contrast to the reactive management, which is traditionally used for rapid impact and subsequent prevention of unpleasant events, the newest predictor and warning in the formation and implementation of management effects based on the concept of systematic (complex) modeling in the relevant monitoring and management system It aims to prevent the occurrence of unpleasant events at the expense of creating opportunities.

Currently, there are various options for organizing proactive monitoring and management of organizational and technical facilities, including technologies for proactive management of structural dynamics of registered facilities. Among these technologies are the following: To change the methods of operation of complex organizational and technical facilities, their goals, their content, consistency of performance in different conditions; Placement in the environment of some elements and subsystems of complex organizational and technical objects; Redistribution and decentralization of information flows, management tasks, issues, algorithms between the levels of organizational and technical objects; in their crisis, it is possible to highlight the change in the configuration of the structures of complex organizational and technical objects.

Proactive (warning) management and monitoring technology of complex organizational and technical objects can be considered as promising technologies for complexity management for multi-structural systems (logistics objects), due to which objects can perform specified tasks with the required level of stability in a (predictable) situation.

CONCLUSIONS AND SUGGESTIONS. In short, the formation and development of a new generation of transport-logistics infrastructure requires the adaptation of an extended logistics engineering model and a life cycle management model, which leads to the use of an innovative management model for sustainable development in the 21st century. Such development should be carried out on the basis of the concept of complex organizational and technical facilities designed for the principle of unification and adaptation of enterprises in order to eliminate the problem of uncertainty and operation of supply chains in the conditions of confusion.

Multimodal and intermodal principles of cargo delivery based on new principles are a special locomotive for the development of a new generation of logistics infrastructure and create new opportunities for the efficient integration of participants in the movement of goods.

Taking into account the increasing volume of electronic data flow in the conditions of "digital logistics", it is extremely important to increase the forecast level of complex organizational and technical objects in the event of errors, and to switch to proactive (warning) management systems based on a comprehensive assessment of the operational dimensions of the logistics infrastructure. The development of innovative logistics technologies in the transport market of Uzbekistan allows to increase the level of influence on the stability and efficiency of multimodal and intermodal transport.

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