AMERICAN JOURNAL OF ECONOMICS AND BUSINESS MANAGEMENT

ISSN: 2576-5973
Vol. 5, No. 1, 2022

The Importance of Digitalization in the Improvement of National Transport Infrastructure

Ergashev Shoxrux Vosiljon ogli
Basic doctoral student of Tashkent State Transport University

Abstract: The article examines the processes related to the importance of digitalization in improving the national transport infrastructure. The impact of digital transport infrastructure on the management of transport and logistics infrastructure and measures to ensure optimal passenger traffic are described. Scientific proposals and practical recommendations on ways to ensure competitiveness by increasing the role of digitalization in improving the national transport infrastructure have been formed.

Keywords: transport infrastructure, transport system, smart transport systems, digitization of the economy, digital technology, integrated transport management system, intelligent transport system.

INTRODUCTION

The importance of transport infrastructure in the globalization process is growing. The tasks of improving the activities of this sector are carried out by the Global Transport and Logistics System. According to the World Bank Group, the volume of world transport services in GDP is 4.2 trillion. It is estimated at 110 billion US dollars (6.8%) per year. tons of cargo and 1 trillion. More than 100 million passengers were transported and the number of employees working in the transport infrastructure reached 100 million. man [7].

In the XXI century, models of formation and use of the state innovation system are developing as complex organizational and technical facilities designed to unite enterprises on the basis of flexible information technologies and highly efficient supply chains. This process also affects the digital transport system and the national transport infrastructure:

Today, the role and characteristics of digital technologies in the transport system allow to ensure the following:

- ✓ random nature of traffic flows, forecasting their parameters with a certain probability;
- ✓ recording of the stationary mode of traffic flows at the expense of the corresponding parameters;
- ✓ effective management of factors that ensure the optimal integration of traffic flows in the organization of transport control, etc.

In the organization of traffic in the transport system and the design of the optimal transport network is necessary to take into account the main characteristics of traffic flow and various dynamic

ISSN 2576-5973 (online), Published by "Global Research Network LLC"
under Volume:5 Issue: 1 in January-2022 https://www.grnjournals.us/index.php/AJEBM

indicators, as well as the impact of external and internal factors on these characteristics. In the context of digitalization of the economy, the most effective solution to this problem is to create a "smart system" of traffic management. This system automatically collects, processes, analyzes the data and makes it possible to select the optimal management decisions in this regard.

Analysis of foreign experience shows that the smart transportation systems of the United States, Japan, Germany, France and China are considered as an intensive factor in solving transportation problems, a mechanism to ensure national security. The intelligent transport system takes into account the features that are artificially created and serve for the integration of the natural intelligent system. This is because modern transport, information, energy and other geographically distributed systems fit into the network structure. A weighted graphics system is used for their general description. In this regard, the issue of interaction with various sectors of the economy in Uzbekistan is relevant in terms of improving the efficiency of management and ensuring its sustainable operation in the national transport system, its infrastructure, multimodal transport system.

LITERATURE REVIEW

Effective management of transport and logistics infrastructure, its content and impact on other sectors of the economy have been studied by a number of economists. In particular, economists have studied the advantages and cost-effectiveness of the organization of freight transport compared to traditional methods in the management of transport and logistics infrastructure in the study of economists S.B.Okwudili [1]. The research conducted by M.V.Ivanov studied the theoretical aspects of the transport infrastructure of the regions, assessed the factors influencing the transport infrastructure and its regional development processes, systematized the organizational and economic framework for improving the efficiency of transport infrastructure in the country [2]. A.Yu.Ledney's research explores the role of improving national transport infrastructure in ensuring the country's sustainable economic development. According to the results of the study, scientific proposals and practical recommendations for improving the role of transport infrastructure design and programs in the development of transport infrastructure and its directions are given [3]. Research conducted by K.V.Pavlov, N.R.Asadullina reveals the features and factors of restructuring, technical re-equipment and modernization of the transport infrastructure complex within the national economy [4]. In the research of L.N.Rudneva, A.M.Kudryavtsev studied the regional aspects of transport and transport infrastructure that create the conditions for its operation. The need to implement an innovative model of transport infrastructure development and improve the quality of life of the region's population for the economic integrity and unity of the regions is noted [5]. M.M.Ziyaeva's research identifies global trends in the development of transport services and identifies the main principles of classification of passenger transport services, taking into account the behavior of consumers in the market [6].

The above research is based on the economic importance of improving the national transport infrastructure, and does not study the processes associated with the conditions and factors of the use of digital technologies in improving the economic efficiency of transport infrastructure.

RESEARCH METHODOLOGY

In the research processeconomic significance of improving the national transport infrastructurestudied by the method of logical abstraction**.**Qualitative and quantitative indicators that affect the process of improving transport infrastructure, such as induction and deductiongeneralized through analytical processes.

ISSN 2576-5973 (online), Published by "Global Research Network LLC"
under Volume:5 Issue: 1 in January-2022 https://www.grnjournals.us/index.php/AJEBM

ANALYSIS AND DISCUSSION OF THE RESULTS

In recent decades, global scientific and technological development trends have significantly strengthened the role of transport systems in the socio-economic development of countries, which in turn has become one of the key factors in developing competitive commodity market infrastructure focused on efficient transport systems.

Within the theory of transport systems, transport systems have traditionally been considered as a set of elements of the transport complex that ensure the continuous movement of goods and passengers for various purposes aimed at meeting the needs of the economy and ensuring the movement of the population. These include transport roads, nodes and corridors, elements of node infrastructure, transport enterprises, vehicles, technical facilities, devices and mechanisms, control and communication systems.

The transport system combines all types of interconnected transport, including: pipeline, water (river and sea), air, rail, road, city, each of which has its own infrastructure, material and technical base and management system. Analyzing the global trends of transport systems change, we can see their rapid development over the past decades, including the achievements of scientific and technological progress, the emergence of advanced techniques and technologies and changes in the intensity of transport in the world economy, transport problems, quality, convenience and safety of transport services. related to increasing the existing requirements.

The main changes in the transport complex can be identified as follows:

- ✓ development of multimodal and intermodal cargo transportation systems;
- ✓ formation of transport and logistics structures, including various terminals, transport and warehouse complexes, distribution centers, etc .;
- ✓ formation and development of intelligent transport systems using the latest information and management technologies;
- ✓ high-speed and high-speed communication (railways, highways, including paved);
- ✓ the emergence of innovative vehicles (for example, high-efficiency innovative freight cars, high-speed vessels, electric vehicles, etc.).

The current stage of development of transport systems is characterized by a number of features that determine their future directions. Along with various political, social, natural-geographical, economic, scientific and technical factors that have a great impact on the development trends of transport systems, global trends in the future economy will create new problems and opportunities, changing the existing shape of the world and making it a reality. remains a factor. Among them:

1. Disruptive technologies can make profound technological changes in various sectors of the economy and spheres of life and significantly change the economic and social aspects of society, existing business models, markets, industries and the world economy in general.
2. The introduction of digital technologies will allow digitizing, data collection and processing of the economy and society, which will lead to socio-economic changes as a result of their use. This speeds up the process of subsequent exchange and transmission of information.
3. Urbanization processes - the development of the strategic concept of "smart city" aimed at the development of urban and regional space, including the search for modern technological, information and communication solutions and effective management of welfare and life

ISSN 2576-5973 (online), Published by "Global Research Network LLC"
under Volume:5 Issue: 1 in January-2022 https://www.grnjournals.us/index.php/AJEBM

processes.

4. The global problem of environmental threats and scarcity of resources, ensuring the coordination of nature management aimed at improving the efficiency of resource use, resource allocation and environmental protection measures, including the development of the economy and the social sphere, taking into account the impact of the environment.
5. Formation on the basis of three criteria in determining the projected value of a particular product of transport services (passenger transport, freight, delivery of goods, etc.), changes in consumer perception in the direction of assessing the cost of the transport process - "good, cheap, faster" allows the imagination to simultaneously assess the quality, cost, and speed of transportation.

Rapid changes in living standards create a new value that allows a person to control and save the time factor they need. The time factor comes to the fore as a key category that necessitates the strengthening of production processes within economic relations.

Thus, taking into account the above-mentioned features of the modern stage of development of the transport system, it should be considered as a transport and logistics system with innovative features, as well as an infrastructural element of the high-speed economy. This will create added value by integrating products and services of a new technological order at all stages of the transport and logistics chain.

The analysis of world trends allowed to distinguish the following modern directions of transport system development:

1. Formation of new concepts and technologies for cargo and passenger transportation (high-speed communication, magnetolevitation transport, hyperlop, etc.).High-speed rail service is one of the most important technological innovations of the last decade, which is based on speed, distance, transit times, as well as multiplier effects for society, economy and the state as a whole. provided. Consisting of high-speed national backbone networks, including Japan, China, Spain, Germany, Italy, Switzerland, France and many other countries, this network seeks to further develop and expand world geography.One of the promising directions in the development of transport systems is magnetolevation technology based on the interaction of electromagnetic fields. This technology is being actively developed and used in China, South Korea and Japan. In the world experience, the application of systems based on magnetic levitation technologies is limited to passenger transportation, but there is sufficient potential for the development of cargo transportation (cargo magnetic-magnetic transport platforms) using high-temperature high-conductivity technologies.The concept of creating a vacuum train in the development stage - hyperloop - is a completely new type of transport, which involves the implementation of a special capsule movement through the pipe under the influence of magnetic and air currents under very low pressure inside the pipe. A test site is currently under construction in the United States, where the motion system is being tested.
2. Development of unmanned (autonomous) vehicles. The use of new technologies in aircraft manufacturing has led to the creation of unmanned aerial vehicles (aircraft or aircraft) that are engine-powered and take to the air by aerodynamic forces and represent autonomous or remote-controlled unmanned aircraft.The use of drones creates new business opportunities in various sectors of the economy, changes business models, provides mobility, especially high accuracy and information quality. Promising areas of application of drones include: delivery of shipments in the field of e-commerce, delivery of spare parts to remote locations, production, use of aircraft as a pilot "defibrillator" in the delivery of food, mail and health products to remote destinations,

ISSN 2576-5973 (online), Published by "Global Research Network LLC"
under Volume:5 Issue: 1 in January-2022 https://www.grnjournals.us/index.php/AJEBM

as well as collecting a variety of data used in smart systems, including making management decisions. Unmanned aerial vehicles are also being developed in the United States.

3. Development of electric transport technologies (electric vehicles, electric wires). Trends in the transition from internal combustion engines to autonomous power sources to electric motors are primarily related to issues of ecology and the use of renewable energy sources. In addition, the use of electric vehicles provides needs-based management while minimizing energy losses. The lack of efficient technologies for the storage of large volumes of electricity and the solution of the problem of high costs of electricity supply, which is a limiting factor for the mass use of electric transport, opens up prospects for its development in the short term.
4. Development of intelligent transportation technology, including intelligent traffic and safety management systems. Smart transport technologies take advantage of the latest advances in the development of global navigation systems and information and telecommunications, which enable the modeling and integration of the information environment of transport systems, which becomes the potential for effective vehicle and flow management. In turn, intelligent transport allows to increase the level of interaction between the participants in the transport process, as well as the quality of transport services provided.
5. Uberization (a U.S. taxi service derived from Uber) is a passenger and freight market. This phenomenon has manifested itself in the segment of taxi services, as there is a direct collaboration between consumers and service providers through the use of IT-platforms (mobile applications). This technology ensures the most efficient use of transportation and minimizes costs compared to traditional types of business. The trend of developing a model based on the Uber principle can be observed in the freight market based on the automation of carrier and sender interactions.
6. Development of multimodal integration of transport with different modes of transport in regional, interregional and international relations, creation of large multimodal centers (centers) based on specific points with sea and river ports, airports, other modes of transport. Implementation of a multimodal approach to the organization of the transport process is an integral condition for optimizing the operation of transport systems, including the rational concentration and distribution of freight flows, the use of cost-effective methods of transport, minimization of freight and transportation costs. Today, the systematic development processes of industrial production are influencing the technological development trends of industrial production under the influence of the intelligent transport system (Table 1). In particular, the digitization of the transport sector has created a process of effective influence on changing the economic basis of production. At present, the following main directions of the digitization process in the field of transport can be highlighted:

1) digitization of transport infrastructure and supply chains (including warehouses and service centers);
2) robotization of production processes;
3) large-scale automation of the management system;
4) introduction of autopilot systems.

At each stage of the digitization of transport infrastructure, the supply chain is managed through a software system. As a result, there is an opportunity to reduce costs in real-time management of the entire transport system, reduce non-core costs, predict the development of the transport sector (Table

ISSN 2576-5973 (online), Published by "Global Research Network LLC"
under Volume:5 Issue: 1 in January-2022 https://www.grnjournals.us/index.php/AJEBM

2).

The robotics system in the transport sector has already been put into practice and is developing at a very rapid pace. However, warehousing (packing and storage of goods) and maintenance of vehicles as the most labor-intensive component still require a wide range of manual labor.

Automation of management processes in the transport sector has been going on and developing for a long time. Indeed, the transport sector is one of the first and one of the areas where management processes are automated. However, under the influence of the speed of modern traffic flows, an automated system cannot make competent and well-thought-out decisions without the human factor.

Table 1 Directions for the use of digital technologies in the transport industry

Direction of action	Scope of application of technologies
Electronic document management	Improving the quality of customer service through the introduction of e-tickets, remote processing of documents on routes, the creation of "virtual offices"
Remote communication	Using a digital technology system for live communication
Payment processing	Use of mobile payment and mobile applications to provide transportation services
Cloud technologies	Data processing to a qualitatively new level; Data analysis and collection using bigdata technology
Integrated transport management system	Automation of transport management system, involvement of the customer in the process of cargo management and control
Intelligent transport system	Forecasting of transport system development processes through automation of traffic management system, support of autopilot systems
Logistics services delivery platform	Creating a digital platform focused on logistics services, including booking tickets, searching for carriers for delivery of goods, selection of the optimal route

Technologically, the introduction of autopilot systems is the first digital technology in the development of the transport system: first of all, it is widely used in the process of transporting civil aircraft, sea cargo. To date, the widespread introduction of these technologies in practice in many countries is limited by the legislative system. Currently, some public transport extreme projects are running only through the autopilot system.

Table 2 Digitization system of the transport sector

An example of technology	Technology functions
SARTRE	Remote control vehicle formation program
Open Shuttle	Receiving interactive loads through an automated system
Pick by light	Use of special indicator lights to optimize the operating system of vehicles
Put by Beamer	Warehouse technology of automatic receipt and distribution of goods

ISSN 2576-5973 (online), Published by "Global Research Network LLC"
under Volume:5 Issue: 1 in January-2022 https://www.grnjournals.us/index.php/AJEBM

Automated port complexes	Use of automated storage systems of container terminals in seaports

It should be noted that the process of using automated transport systems in the economy of each country is a topic of debate and debate. The lack of consensus in society on this has a negative impact on the effectiveness of the system.

CONCLUSIONS AND SUGGESTIONS

The following threats and dangers can be identified as direct consequences of transport system automation

1) dismissal of specialists working in the field of transport, mainly unable to find work in their profession;
2) difficulties in determining the measure of responsibility in the event of an insured event;
3) the risk of software failure and loss of control over the vehicle being driven.

However, the advantages of introducing such technologies are as follows:

1. increase the efficiency of the transport sector (reduce fuel costs, reduce accidents, reduce the number and proportion of victims of traffic accidents), reduce the amount of cargo damaged during transportation;
2. reduction of wage costs at the expense of automation workplaces;
3. reduction of transport downtime;
4. reducing the amount of errors and omissions that may occur under the influence of the human factor.

An important aspect of digitization of the transport system is that artificial intelligence (SI) technology is increasingly becoming a general-purpose technology for transportation (TUMT). The overall advantages of using new digital technologies are important as they provide opportunities to effectively address systemic problems that may occur in the transportation system.

In an environment where the risk of criminalization of crimes in the transport system is increasing, facial recognition and remote identification technologies make it possible to create complete safety zones around vehicles. Such approaches can already be found at international airports: ubiquitous photography, the use of drones, as well as the availability of a single system based on the data obtained, allowing for real-time identification of passengers. This will not only reduce the level of threat that may occur at transport facilities, but also prevent crimes related to property damage.

REFERENCES:

1. Okwudili S.B Significance of Road Infrastructure on Economic Sustainability. American International Journal of Multidisciplinary Scientific Research; Vol. 5, no. 4; 2019 ISSN 2638-1249 E-ISSN 2638-1273
2. Ivanov M.V. Development of transport infrastructure in the region: factors, directions, tools otsenki. The abstract of the dissertation on the study of the degree of candidate of economic sciences. - V. 2016
3. Ledney A.Yu. Development of methodical approaches to the assessment of economic efficiency of development of transport infrastructure with uchetom volumes and uneven transportation. The

ISSN 2576-5973 (online), Published by "Global Research Network LLC"
under Volume:5 Issue: 1 in January-2022 https://www.grnjournals.us/index.php/AJEBM

abstract of the dissertation on the study of the degree of candidate of economic sciences. - M. 2020

4. Pavlov K.V, Asadullina N.R. Development of transport systems of the Republic of Uzbekistan in the world of development of general theories of economic modernization // National interests: priorities and security. 2012. №39.
5. Rudneva L.N, Kudryavtsev A.M. Transport infrastructure of the region: understanding and factors of formation // Rossiyskoe predprinimatelstvo, 2013. № 24 (246). S. 139-144.
6. Ziyaeva M.M.. Marketing strategy for the development of the services market (on the example of Uzbekistan Railways). Abstract of the dissertation of Doctor of Economics (DSc). – T. 2018
7. The World Bank: World Development Indicators.http: // data. worldbank.org / indicator

ISSN 2576-5973 (online), Published by "Global Research Network LLC"
under Volume:5 Issue: 1 in January-2022 https://www.grnjournals.us/index.php/AJEBM