INFLUENCE OF THE DIGITAL ECONOMY ON THE DEVELOPMENT OF THE TRANSPORT INDUSTRY

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Abstract

The article reveals the nature and mechanisms of the influence of the digital economy on the development of the transport industry in the world. The relevance of research on digitalization in the transport sector is determined by several factors. Firstly, it is in the transport sector that the use of digital technologies is especially evident: this facilitates an understanding of the nature of the digitalization process. Secondly, it is the efficiency of using the latest technological achievements that determines the competitiveness of transport companies, and in this context, the study of the impact of digital technologies on production processes in this area is of the greatest practical interest. The aim of the study of this topic is to identify the most significant manifestations of the impact of digitalization on the transport sector, trends and the nature of such an impact.

Keywords: digital economy, digitalization, transport digitalization, digital technologies for the transport sector.

Introduction

In the context of the knowledge economy, digitalization processes are recognized as one of the most significant manifestations of innovative, scientific and technological development. At the same time, there are no clear estimates of how large-scale economic transformations due to digitalization will be, how and when they will manifest themselves. The transport sector was one of the first to experience the introduction of digital technologies: the objective need to automate management and improve the reliability of the transport system prompted transport companies to computerize management processes before others, and then digitalize the entire sector.

A distinctive feature of digitalization in the transport sector is that it occurs unevenly in each direction, despite the fact that the potential need for digitalization is great. It is the active use of digital technologies that seems to be the most promising way to increase the economic efficiency of this area. We can highlight the most popular areas of using digital technologies for transport needs.

The transport industry is one of the areas of economic activity that is most susceptible to the influence of digitalization processes. Such influence can be divided into obvious, superficial changes in this area and those that occur in the transport infrastructure itself. In the first case, we are talking about the penetration into the transport sector of those technologies that have been successfully tested in other areas: "big data", intellectualization processes.

Thus, intelligent transport systems (ITS) are the main trend in the technological development of the industry. In the second case, digitalization of the transport sector implies a change in the very technical and economic foundations of production. At the moment, there are four key directions in the process of digitalization of the transport sector: 1) digitalization of transport infrastructure and supply chains; 2) robotization of production processes; 3) large-scale automation, including management processes; 4) implementation of autopilot systems.

Let's consider these processes in more detail.

1) The digitalization of transport infrastructure lies in the fact that each stage in the logistics chain, as well as the vehicle, must be involved in the digital sphere, that is, have a personal identification on the Internet, and also be controlled by software. This allows you to manage all traffic flow in real time, reduce costs, non-core expenses, and also make the transport sector more predictable. An example of such digitalization is equipping all sea containers with chips, tracking the movement of each container;

2) Robotization of production processes in the transport sector is already occurring at a very rapid pace. However, the most labor-intensive components are warehousing (especially packaging and cargo picking), vehicle maintenance still require extensive manual labor;

3) automation of management processes has been happening for a long time. Actually, it was the transport sector that was one of the first in which management processes began to be automated. The speed of modern traffic flows is such that a person, in principle, will not be able to make competent, thoughtful decisions without the risk of a critical error;

4) The implementation of autopilot systems from a technological point of view has already been going on for a long time: first of all, this concerns autopilots for civil aircraft and maritime cargo transportation. The mass introduction of these technologies in most countries is hampered by legal restrictions. Thus, only some experimental projects in public transport are currently operating (unmanned buses, for example).

Digitalization as a trend in the technological development of the transport sector has been identified quite a long time ago. In fact, we can talk about the fact that the penetration of digital technologies into the transport sector began with the emergence of electronic computing technology. During this period, a large number of different projects were implemented, both at the initiative of governments and private companies.

It should be noted that the use of automated transport systems is still a controversial issue on which there is no consensus in society. The threats and risks that are indicated as a direct consequence of automation in transport include: 1) the immediate release of a large number of drivers who, in principle, will no longer be able to find employment in their profession; 2) difficulties in determining the extent of liability in the event of an insured event; 3) the risk of software failure and loss of control over the driven vehicle.

At the same time, the advantages of introducing such technologies are clearly recognized: 1) increasing the efficiency of the transport sector as such (reducing fuel costs, increasing road capacity, reducing accident rates, reducing the number of victims in transport accidents and the proportion of cargo damaged during transportation); 2) reduction in labor costs for drivers and many employees whose jobs will be automated; 3) reducing vehicle downtime; 4) elimination of the so-called "human factor", that is, the risk of human error.

One of the important trends is that artificial intelligence (AI) technology is becoming a general purpose technology (GPT) for transport. In addition, the person himself (including the average person) is becoming more and more "armed" with a variety of technologies, primarily thanks to his smartphone. The presence of a mobile device for accessing the Internet and the mass distribution of such devices make it possible to build a new interaction between the entire transport sector and users. The emergence of a service such as UBER and the subsequent term "uberization" radically changed the fundamental principles of providing services in the transport sector.

Robotization in transport has its own specifics, which sets this area apart from other areas of economic activity. Thus, robotization is often considered as the production and use of certain physical machines that are capable of imitating any human actions. However, in reality, autonomous systems cover a much wider range of areas. Robotization should be more correctly considered as the production and use of self-controlling adaptive intelligent systems that can perform their production functions regardless of the degree of human intervention. In the transport sector, robotization includes the introduction of autonomous vehicles, as well as the automation of production itself and the use of equipment that operates without human intervention.

It is customary to distinguish the following types of robotic technology used in the transport sector: 1) robots operating in the human environment; 2) robotic production systems that do not require human intervention; 3) autonomous vehicles.

So, speaking about specific examples, it should be said that autonomous systems have long been used at service stations (both road transport and railway). In the future, the accumulated experience makes it possible to expand the practice of using such technologies to all components of the transport sector (including with the increasing involvement of AI technologies in this process).

A separate issue is the use of drones (hereinafter – unmanned aerial vehicles). Although the legal basis for the use of nuclear flying vehicles has not yet been created in most countries (or the use of such devices is simply limited), the potential for their use for transport needs is very great. Drones can be used for aerial photography, as well as constant monitoring and cargo tracking. With the power of drones constantly increasing (in every way), it will soon be possible to use these devices to transport people and goods to remote areas. "Swarm robots," that is, the simultaneous use of a large number of drones controlled by one operator (or one AI), in principle allows for repair work. At this stage, drones are mostly used for external surveillance. For example, in Germany, patrol drones are used to monitor sections of the railway track in order to identify violators of the regime and vandals. Of course, the potential of drones is such that they themselves could soon become a new mode of transport.

The practical benefits of using new digital technologies (both drones and robotic suits for workers - exoskeleton) make it possible to solve more pressing and significant problems. With the help of such devices, it is possible for workers to perform more difficult tasks, reduce the damage to health from working in difficult conditions (working on high-voltage lines, working in hazardous conditions, when laying tunnels, etc.).

Reducing the level of criminalization and the risk of crime in transport. Facial recognition and remote personal identification technologies make it possible to create complete security zones around key transport facilities. Such approaches can already be found at international airports: widespread video recording, the use of drones, as well as the existence of a unified information system that operates on the information received, making it possible to identify almost every person in a crowd of passengers. This will not only reduce the level of potential threat at transport facilities, but also solve more trivial problems: tracking unscrupulous passengers who damage property, for example.

In Uzbekistan, digitalization processes have not gone unnoticed either by government authorities or the private sector. Thus, the country is implementing a number of

measures aimed at preparing the economy and society for digitalization processes. In 2020, the Strategy "Digital Uzbekistan – 2030" was approved. The implementation of the document is aimed at digitalization of regions and industries. Each direction has its own road map.

In the process of digitalization of the economy, digital information platforms (DPIs) play an important role. The purpose of such structures is the integration of all participants in the value chain, as well as communication channels, distribution routes, and a community of potential customers. The current scope of digital platforms is such that they can cover entire sectors of the economy. In fact, there are plenty of examples of such digital platforms, especially in e-commerce. However, we can expect that such technologies will be increasingly used in the transport sector.

In fact, digital platforms are already used in the transport sector, although they are not yet as universal as electronic platforms. Thus, in logistics, specialized local digital platforms are used to plan the transportation process, as well as organize cooperation between various modes of transport and logistics centers. Digital platforms help coordinate cargo processing in warehouses and establish communication with the end user. Digital platforms in the transport sector incorporate all intermediary functions. Using platforms, the end consumer can directly establish contact with the supplier, and the platform will provide him with all the necessary tools for managing the movement of goods. In other words, this type of digital platforms is able to integrate all logistics and other processes into a single system, connect consumers and producers, and also take over the management of all additional functions.

At the same time, digitalization of the logistics sector is also a challenge. The process of digitalization can change the market in such a way that all its participants will face the most serious challenges. The most significant of them can be described as the emergence of a market taught by just one monopolist: we are talking about a market model that is commonly called "winner takes all." That is, integration in each market segment reaches the point beyond which there is the emergence of one, very large monopolist. This can be seen in the e-commerce market - Amazon, for example. With the emergence of such a monopolist, all other participants become very dependent on the market leader. Similar processes can be observed in the transport sector: logistics companies are increasingly dependent on the e-commerce sector (Internet exchanges, online stores).

According to most scientists involved in this issue, in the future the delivery of goods (and absolutely all goods) will be carried out directly from the warehouse (which will belong to the largest online store) to the client, bypassing the retail network. "Convenience stores" will be replaced by points for dispensing pre-ordered goods. At

the same time, another very important thing happens: online stores, along with the product, also sell a delivery service. That is, soon only companies that will be integrated with the largest sales platforms will remain in the logistics services market. It is the largest players in the e-commerce market that will determine who will remain in the market and what margin they will receive. However, such companies may not even have their own physical assets.

Conclusion. Thus, it can be argued that digitalization is the dominant process in the transport sector among all manifestations of scientific and technological progress. In addition, digitalization processes themselves are happening much faster than previous technological revolutions. As a result, the end result of these transformations is difficult to predict. However, two most significant components can be identified. On the one hand, the effective use of digital technologies in the transport sector determines the level of competitiveness of the company. Those who ignore modern changes risk leaving the market. On the other hand, it is digitalization processes that are a source of increased risks: both in the context of economic development and in the context of social progress.

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