

ICEST 2021

II International Conference on Economic and Social Trends for Sustainability of Modern Society

**FORMATION AND DEVELOPMENT OF URBAN LOGISTICS IN
THE CONTEXT OF DIGITAL TRANSFORMATION**

Bella Rakhimova (a)*, Seda Aslakhanova (b)

*Corresponding author

(a) Kh. Ibragimov Complex Institute of the Russian Academy of Sciences, Staropromyslovskoe highway, 21 a,
Grozny, Russia, ya210412@yandex.ru

(b) The Chechen State University, Subra Kishieva Street, 33, Grozny, Russia, Zvezdochkagoodluck@mail.ru

Abstract

Today digital technologies have taken a leading place in the development of various sectors of the economy and have made profound changes in the daily life of people. The role of digital technologies in the urban environment is increasing with everyone, becoming one of the tools to ensure a comfortable life for the population and the development of the city's transport infrastructure. The aim of our research is the formation and development of urban logistics in the context of digital transformation. To achieve this goal, it is necessary to solve a number of tasks: to identify approaches to the definition of the term "logistics"; consider the application of digital technologies at the state level; review the scientific literature on the application of digital technologies; assess the problems of the development of digital technologies in the labour market; analyse the regulation of the digital environment. On the basis of the established goal and objectives of the study, the main problems of digital technologies in urban logistics were identified: the main problems of the development of the city's logistics system on the example of the Chechen Republic in the context of digital transformation: low level of provision of qualified personnel; insufficient level of digitalization of local self-government bodies, etc. Based on the described problems, recommendations are given for the development of the urban environment in the context of digitalization.

2357-1330 © 2021 Published by European Publisher.

Keywords: Urban logistics, digitalization, logistics system, digital transformation, digital technologies



This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 Unported License, permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

1. Introduction

The use of digital technologies in the modern world has resulted in the transformation of various sectors of the economy and spheres of human activity. The formation and development of urban logistics using digital technologies, the main task of which is the organization, regulation and control of streaming processes in the urban environment, plays a priority role in ensuring the prosperous life of the population. Urban logistics, first of all, is aimed at efficient management of the city's infrastructure, development of transport and logistics services, protection of the environment from harmful emissions and operational interaction between the state, business, science and the population.

1.1. Definition of "logistics"

Today there is no single definition of the term "logistics". So, for example, according to Professor A. A. Smekhov, logistics is "a new scientific direction, the doctrine of planning, management and observation during the movement of material and information flows in production and energy systems" (as cited in Albekov et al., 2017, p. 10). Professor G. Pavellek believes that logistics is "planning, management and control of the material flow entering the enterprise, processed there and leaving this enterprise and the corresponding information flow" (as cited in Albekov et al., 2017, p. 10). I. V. Sergeev considers logistics "from the perspective of an entrepreneur as a pragmatically directed mechanism: it is an integral management tool that contributes to the achievement of strategic, tactical or operational goals of organizing a business through the effective management of material and service flows, as well as the accompanying flows of information and financial resources" (as cited in Albekov et al., 2017, p. 10). It is worth noting that with the development of logistics in different countries, they began to give their definitions.

For example, in the United States, logistics is interpreted as "the art and science of managing technology, which involves planning, supplying and using means of movement to implement planned operations in the name of achieving a goal" (Lepetukhina & Lanovaya, 2016, p. 85). In France, logistics is defined as "a set of different activities in order to obtain, at the lowest cost, the required quantity of products at a specified time and place where there is a need for a given product" (Lepetukhina & Lanovaya, 2016, p. 85). Germany interprets the definition of "logistics" as "the process of planning, marketing and controlling materials, semi-finished and finished goods, and related information about the supply of goods" (Lepetukhina & Lanovaya, 2016, p. 85). In other words, the definition of "logistics" includes the organization, planning, management and control of flow processes in the process of manufacturing products and bringing them to the consumer.

1.2. The use of digital technologies at the state level

The importance of the role of the digital economy at the state level is evidenced by the fact that countries such as South Korea, Singapore and Hong Kong are leaders in digitalization. For them, the priority area of development is the use of digital tools in the field of consumption; training of personnel with digital competencies; support for IT startups; providing broadband Internet access and exporting digital goods (Harvard Business Review, 2020).

Along with Asian countries paying close attention to the development of the digital economy, Russia is also taking steps to digitize the basic sectors of the economy. Thus, the National Program "Digital Economy of Russia" is being implemented. An intermediate result of the implementation of the program is the introduction of amendments to the Federal Law "On Amendments to Parts One, Two and Article 1124 of Part Three of the Civil Code of the Russian Federation" dated March 18, 2019 No. 34-FZ, which introduced the concept of digital rights; VAT exemptions for the export of IT services are presented; e-books have replaced paper work books; digitalization of some notary services was carried out; provides the possibility of issuing a patent for an invention in electronic form, etc. (Ministry of Economic Development of the Russian Federation, 2021).

The use of digital technologies in the socio-economic development of the region leads to the transformation of business processes and the labour market, has a huge impact on the daily life of people, introducing profound changes into it.

1.2.1. Review of scientific literature on the application of digital technologies

Many scientific papers have been published on the topic of the application of digital technologies. In their works, the authors emphasize the importance of using cloud technologies in the educational process (Davydova et al., 2017), in the role of data analysis in business processes, in financial risk management and analysis of data on the incidence of COVID-19 (Chakravorty et al., 2021; Grishanov & Opritova, 2020; Shuldova & Zmeeva, 2020; Vertakova et al., 2020).

1.2.2. Problems of the development of digital technologies in the labour market

The use of digital technologies leads to the disappearance of some professions and the emergence of new professions. For example, a cashier, stuntman, driver and others. New professions include such professions as network lawyer, digital linguist, information systems architect, interior designer and virtual worlds designer and others. In the process of transformation of labour market requirements, an increase in the unemployment rate is possible. In order to reduce the degree of social tension, measures are already being taken to train personnel with digital skills.

Another disadvantage of using digital technologies is the lack of desire to master digital skills or the difficulty of their perception. For example, a 45-year-old employee with extensive sales experience, but not versed in new digital sales models, is applying for the position of a sales manager. Another employee with digital competencies with no work experience is applying for the same position. From our point of view, it is possible to merge experience and youth to effectively solve business problems.

1.2.3. Regulatory regulation of the digital environment

The use of digital technologies in various sectors of the economy is the reason for making changes to the legislative framework (Legislative support system, 2021):

- Federal Law "On Amendments to Article 4 of the Law of the Russian Federation "On Protection of Consumer Rights" dated 02.12.2019, No. 425-FZ;

- Federal Law "On Amendments to the Fundamentals of the Legislation of the Russian Federation on Notaries and Certain Legislative Acts of the Russian Federation" dated December 27, 2019 No. 480-FZ;
- Federal Law "On Amendments to the Federal Law" On Electronic Signatures "and Article 1 of the Federal Law" On the Protection of the Rights of Legal Entities and Individual Entrepreneurs in the Exercise of State Control (Supervision) and Municipal Control No. 476-FZ, dated December 27, 2019.

Note that today there is an acute issue of state regulation of the development of the digital economy and the widespread use of digital technologies in the production, supply and sale of products. The development of urban logistics in the context of digital transformation has not been adequately studied.

2. Problem Statement

Today, at the regional level, there is a gap in the use of digital technologies in urban logistics and the formation of the city's transport infrastructure. The cities of federal significance - Moscow and St. Petersburg - demonstrate positive dynamics in the formation and development of digital technologies in urban logistics. The issue of using digital technologies in urban logistics has not been widely studied, therefore, it is necessary to pay attention to two main problems:

- Features of city logistics system management.
- Formation and development of urban logistics in the context of digital transformation on the example of the Chechen Republic.

3. Research Questions

During the research, the following issues were considered:

- Approaches to the definition of the term "logistics".
- Issues of using digital technologies at the state level.
- Review of scientific literature on the application of digital technologies.
- Problems of the development of digital technologies in the labour market.
- Regulatory regulation of the digital environment.

4. Purpose of the Study

The purpose of the study is the formation and development of urban logistics in the context of digital transformation. To achieve this goal, it is necessary to solve the above research tasks and offer recommendations for the effective use of digital technologies in the urban logistics of the region.

5. Research Methods

In the course of the study, the authors used methods of statistical and comparative analysis.

The development of the digital economy has spurred the development of digital logistics, expanding the field of competition at the micro, macro and mesoeconomic levels. Information and knowledge about the use of digital technologies in socio-economic development is becoming the main instrument of competition in the context of digital transformation. Digital technologies pervade all areas of logistics - supply, production, sales - making it their task to plan, manage and control economic flows in a new environment. Urban logistics is one of the priority areas for the socio-economic development of the region using digital technologies.

5.1. City logistics system management

Management of the city's logistics system involves the organization and control of the city's transport and logistics services, the formation and development of a warehouse network, the use of digital technologies in the process of providing public services to domestic and foreign suppliers of products, forecasting and planning the formation and development of streaming processes.

The purpose of the formation and development of urban logistics in the context of digital transformation is to create favourable conditions for comfortable living of residents and guests of the city using digital technologies. Based on the goal of the formation and development of urban logistics in the context of digital transformation, we will highlight the main tasks: establishing cultural ties with neighboring cities and the region using remote communication tools, creating and developing a logistics infrastructure for the supply and procurement of a trade and entrepreneurial network and the integration of digital technologies into entrepreneurial activity, improving the efficiency of material flow management in the urban environment using remote monitoring tools and minimizing costs in the process of bringing raw materials to the consumer, protecting the environment and ensuring the environmental safety of the city. Along with this, there are a number of problems that urban logistics is aimed at solving: a low level of digital interaction between production facilities and infrastructure at the state, regional and local levels and the integration of manufacturing enterprises and trade organizations into a single network; lack of an information base on importers and exporters of goods and capacity of vehicles; the backwardness of the technical level of infrastructure and the need for its modernization.

5.2. Formation and development of urban logistics in the context of digital transformation on the example of the Chechen Republic

The Chechen Republic is a successfully developing region of the North Caucasus Federal District with enterprises in the agro-industrial complex, production, electricity and water supply, construction and trade, transportation, finance and insurance, and others. As of January 1, 2021, there were 9,515 organizations in the region: of them, in the field of agriculture - 907 organizations, mining - 40, manufacturing - 389, in the field of electricity and water supply - 30 and 47 organizations, respectively, in the construction sector. and in the field of trade - 1,556 and 2,043 organizations, respectively, in the field of transportation - 229, financial and insurance activities are provided by 188 organizations, etc. (Territorial

body of the Federal State Statistics Service for the Chechen Republic [FSSSCR], 2021). On the territory of the Chechen Republic there are federal, regional and local roads with a length of 246.5 km, 3,039.8 km and 9,085.518 km, respectively (Ministry of Roads of the Chechen Republic, 2021).

In 2019, 288 thousand tons of goods were transported by rail, which is 57 thousand tons less than in 2018. there is also a decrease in the transportation of goods by rail - 194 thousand and 192 thousand tons, respectively. Along with this, road transport has shown a decrease in the transportation of goods since 2017. So, in 2015, goods were transported by road transport 11 847.6 thousand tons, in 2016 - 11 648.5 thousand tons, in 2017 - 10 159.1 thousand tons, in 2018 - 9 033.5 thousand tons, in 2019 - 7 962.4 thousand tons (FSSSCR, 2021).

Let's highlight the main reasons for the decrease in traffic in the country:

1. A decrease in the purchasing power of the population and a difficult economic situation, which caused the bankruptcy of transport and logistics companies of small and medium-sized businesses. At the end of 2020, the average per capita monetary income of the Russian population amounted to 35,676 rubles/month. It should be noted that in 2019 this indicator was 35,338 rubles/month, in 2018 - 33,266 rubles/month, in 2017 - 31,897 rubles/month. In other words, since 2017, the average per capita money income of the Russian population has increased by 3,779 rubles/month. and 338 rubles/month. relative to 2019. Among the subjects of Russia, the leader in terms of per capita money income of the population was the Central Federal District (FD) with an indicator of 47,538 rubles/month. In the North Caucasian Federal District, the average per capita income of the population in 2019 was 24,317 rubles/month. against 30,984 rubles/month in 2018 Among the regions of the North Caucasus Federal District, the top three in terms of per capita money income in 2019 included the Republic of Dagestan, the Republic of North Ossetia-Alania and the Stavropol Territory with 27,641 rubles/month, 23,929 rubles/month. and 23,791 rubles/month. respectively. In 2019, the average per capita monetary income of the population in the Chechen Republic amounted to 24,391 rubles/month, which is 6,471 rubles/month. less than in 2018 and by 651 rubles/month. in 2017 (Federal State Statistics Service, 2021).

It should be noted that in the first quarter of 2020 the average per capita monetary income of the population of Russia amounted to 31,647.4 rubles/month, and for the second quarter of 2020 - 32,854.4 rubles/month. For the same period of 2020 in the Chechen Republic, this indicator reached 21,154 rubles/month. and 21,060 rubles/month. We are observing a decrease in the average per capita money income of the population as a result of the introduction of restrictive measures and the closure of enterprises.

2. The emergence of transport and logistics companies using price dumping to attract customers and to eliminate competitors. The negative result of this situation is that in such conditions companies do not function for a long time, which leads to their bankruptcy, however, the established prices in most cases cannot be changed. In January-September 2020, the transportation of goods by transport of all sectors of the economy fell by 93.4% compared to the same period in 2019. At the same time, sea, inland water and air transport became the leader in terms of the number of declines from 120.9%, 99.8 % and 97.5%, respectively. There is also a decrease in commercial traffic in January-September 2020 by transport of all sectors of the economy by 95.2% compared to the same period in 2019 (Ministry of Transport of the Russian Federation Transport of Russia, 2021). At the end of 2020, cargo transportation decreased by 4.9%: rail transportation - by 2.2%, road - by 1.4%, air - by 3.8%) (Ministry of Transport of the Russian Federation

Transport of Russia, 2021). The reasons for the decrease in cargo transportation by transport of all industries is the closure of borders to prevent the spread of the COVID-19 pandemic.

The role of urban logistics in the formation and development of urban transport takes a priority place in creating favorable conditions for the population. At the same time, it is necessary to take into account that the most important role in ensuring the efficiency of urban logistics is played by the level of development of transport infrastructure, the solution of the problems of which is in the competence of state authorities. For the effective functioning of urban transport, in our opinion, it is necessary to create a Unified Regional Navigation and Information System of the city, which will be focused on ensuring the operation of the city's transport infrastructure in real time and to ensure interaction between government bodies in the online mode.

As part of the implementation of the National Program "Digital Economy" on the territory of the Chechen Republic 86 social objects were connected to the Internet, over 130 thousand state and municipal services were provided in electronic form, 800 thousand people were registered in the Unified Information System and the number of settlements decreased from 208 to 77 without 4G network (Russian news agency TASS in Chechnya, 2020).

Within the framework of the regional project "Digital Technologies" in the Chechen Republics it is planned to create "end-to-end" digital technologies. Within the framework of the Digital Valley project, it is planned to produce high-tech products in Grozny and develop a city like smart cities. The priority areas of development will be blockchain technologies in the public sector and information technology applications in the construction and agro-industrial sectors, as well as the development of IT infrastructure of regional significance (Tadviser, 2021).

6. Findings

6.1. Heading Level 2 Features of the use of digital technologies in urban logistics

The formation of infrastructure using the principles of logistics management, in order to meet the needs of the population, planning and organizing material flows, plays a key role in the development of urban logistics. The creation of a Unified Information System of the city presupposes the operational interaction of municipal authorities in the development of the city's road network, the creation of transport and logistics centers for forwarding and transport companies, the improvement of the public transport scheme, the reduction of the transport and environmental load of the city, the creation of an intelligent transport system based on multi-criteria optimization work and others.

It should be noted that the issue of managing the city's logistics system is relevant not only for megalopolises, but also for small towns, for which the issue of ensuring the efficiency of cargo transportation and passenger flow is important. The creation of an effective city management system and the establishment of interaction between business entities, government bodies and the population requires the formation of a high-performance information system, since freight flows provide the listed facilities with goods and products in the required quantity and at a given time, whose efficiency and efficiency of product delivery are reflected in the image of the city.

Today, a number of transport companies operate in the Chechen Republic, which are engaged in cargo transportation. Among them are such companies as Business Lines, Energia, CDEK, EliteTrans, MegaTrans, Magic Trans, Dpd and others.

The use of the Internet and digital technologies is one of the modern features of the formation and development of modern urban logistics. The introduction of digital technologies in the management of the city's logistics system involves the introduction of electronic document management, electronic payments, the use of the GLONASS system and others. Along with this, despite the active use of digital technologies, the city's logistics face a number of problems that need to be addressed. Such problems include the appearance of "traffic jams" on the roads due to the increase in vehicles, which is relevant both for megalopolises and for small towns. At the same time, the problem of slowing down traffic on the roads is especially acute in the morning and evening, when people go to work and return home.

As mentioned above, one of the ways for the development of the city's logistics is the creation of the Unified Regional Navigation and Information System of the city, which has proven its effectiveness in Moscow, the purpose of which is to increase the efficiency of the city's transport infrastructure. The main users of the Unified Regional Navigation and Information System of the city include vehicle owners, federal and local authorities, emergency services of the city and others. The activities of the Unified Regional Navigation and Information System of the city are regulated by regulatory legal acts, including federal laws, decisions of regional authorities, etc.

7. Conclusion

Based on the foregoing, we can note that the use of digital technologies in urban logistics is one of the topical issues in the formation and development of the modern urban environment, in general, and transport infrastructure, in particular.

7.1. Problems of the development of the logistics system of the city on the example of the Chechen Republic

Let's highlight the main problems of the development of the city's logistics system using the example of the Chechen Republic in the context of digital transformation:

- Low level of provision of qualified personnel with digital competencies for the needs of the city.
- Insufficient level of digitalization of local self-government bodies in order to improve the well-being of the population and improve the quality of services provided.
- Lack of a unified regional navigation and information system of the city for the efficient functioning of public transport and cargo transportation.

7.2. Prospects for the development of the city's logistics system on the example of the Chechen Republic

Today, the Chechen Republic is taking steps to digitize the region. Thus, in Grozny, two pilot automated systems for managing housing and communal services and rental municipal property were launched, which saves up to 20% of the budget for administering housing and communal services and municipal areas. According to the region's leadership, it will stimulate the development of the business sector (Mayor's Office of Grozny, 2021).

The Chechen Republic hosted a conference "Digital transformation - a window of opportunities for attracting investments in the economy of the Chechen Republic", where it was noted that digitalization will have a positive impact on optimizing logistics costs, increase labour productivity and reduce production costs.

References

- Albekov, A. U., Parkhomenko, T. V., & Lopatkin, G. A. (2017). *Logistics: A Textbook*. RIOR: INFRA-M.
- Chakravorty, B., Bhalla, A., & Shankar, R., & Chaturvedi (2021). *The most digital countries in the world: rankings 2020*. hbr-russia.ru
- Davydova, E. V., Erokhin, A. G., & Frolova, E. A. (2017). Teaching cloud technologies and the use of cloud technologies in teaching students. *Methodological issues of teaching infocommunications at the Higher School*, 7-9.
- Federal State Statistics Service. (2021). *Standard of living. Income, expenses and savings of the population*. <https://rosstat.gov.ru/folder/13397?print=1>
- Grishanov, E. N., & Opritova, M. A. (2020). The use of big data analysis technology in business applications. *XLVIII Ogarevsky readings: scientific materials. conf. Part 2*, 652-657.
- Harvard Business Review. (2020). *The CEO of Slack on Adapting in Response to a Global Crisis*. <https://hbr.org/2020/07/the-ceo-of-slack-on-adapting-in-response-to-a-global-crisis>
- Lepetukhina, E. V., & Lanovaya, V. M. (2016). Logistic activities in territorial entities of various scales. *Vestnik Moskovskogo un-ta im. S.Yu. Witte. Series 1: Economics and Management*, 84-90.
- Legislative support system. (2021). *Lists of bills and draft resolutions*. sozd.duma.gov.ru
- Mayor's Office of Grozny. (2021). *Launched digital transformation projects of the Chechen Republic*. grozmer.ru/events/zapuscheny-proekty-cifrovoy-transformatsii.html
- Ministry of Roads of the Chechen Republic. (2021). *Roads of the Chechen Republic*. <https://www.minavtodor-chr.ru/2019/03/27/dorogi-chechenskoj-respubliki/>
- Ministry of Economic Development of the Russian Federation. (2021). *Regulatory Regulation of the Digital Environment*. economy.gov.ru
- Ministry of Transport of the Russian Federation Transport of Russia. (2021). Information and statistical bulletin. January - September 2020 <https://mintrans.gov.ru/documents/7/11053>
- Russian news agency TASS in Chechnya. (2020). *86 socially significant objects were connected to the Internet in 2019*. <https://tass.ru/v-strane/7630149>
- Shuldova, S. G., & Zmeeva, Yu. V. (2020). Using OLAP Technologies to Analyze COVID-19. *Incidence Data Governance in Social and Economic Systems* 51-53.
- Tadviser. (2021). *Digital Valley in Chechnya*. https://www.tadviser.ru/index.php/Company:Digital_Valley_in_Chechnya
- Territorial body of the Federal State Statistics Service for the Chechen Republic [FSSSCR]. (2021). *Transport and communication*. <https://chechenstat.gks.ru/folder/39020>
- Vertakova, Yu. V., Shui, D., & Yai, L. (2020). Application of Big Data Analysis Technology in Financial Risk Management of the Innovative Industrial Cluster. *Izvestia Yugo-Zapadny State University. Series: Economics. Sociology. Management*, 90-98.