Мука:

- ТОО «Сункар и К»- на Афганистан – отсутствие заявки на 229 вагонов – 14600 тонн из-за отсутствия разрешения из Нурсултан, на Узбекистан – 43 вагона - 2752 тонны, отсутствие заявки на 5 вагонов – 320 тонн на Ашхабад, 8 вагонов – 640 т - штраф.

- «КазУзЭкспорт» нет подтверждения из Нурсултан на 36 вагонов – 2273 тонны на экспорт.

- ТОО Эко Тера отсутствие заявки на 85 вагонов – 5806 тонн, ввиду ее завышения, 35 вагонов – 2380 тонн из-за отсутствия подтверждения плана из Нурсултан [5].

Усовершенствование условий перевозок для грузоотправителей за счет предоставления лучшего на рынке предложения по оперированию вагонами. Оптимизировать стоимость транспортировки через дальнейшее внедрение программы снижения затрат с повышенными целями по экономии и оптимизацию распределения потока с учетом использования электрифицированных путей и участков с наименьшей загрузкой для снижения требований к расширению пропускной способности [6].

ЛИТЕРАТУРА

1. Программа «Цифровая экономика Российской Федерации», утверждена Распоряжением Правительства Российской Федерации от 28 июля 2017 г. №1632-р [Электронный ресурс]. – Режим доступа: http://static.government.ru/media/files.

2. Индикаторы цифровой экономики [Электронный ресурс] // Статистический сборник ВШЭ. – Режим доступа: https://www.hse.ru/primarydata/ice2017.

3. Материалы официального сайта ОАО «РЖД» [Электронный ресурс]. – Режим доступа: http://www.rzd.ru.

4. Разработка технологии работы железнодорожного транспорта общего пользования Республики Беларусь в условиях применения электронных юридически значимых документов: отчёт о НИР № 9558 / Белорус. гос.ун-т трансп. ; рук. Еловой И. А.; исполн.: Колос М. М. [и др.]. – Гомель, 2016. – 283 с.14.

5. Г.Б. Серикова, С.Е. Бекжанова, Б.М. Исина Информатизация технологических цепей перевозок грузов. XLIII Международной научно-практической конференции «Инновационные технологии на транспорте: образование, наука, практика» посвященной 140-летию Мухамеджана Тынышпаева. Том 2. Алматы. 2019г. С. 98-101

6. С.Е. Бекжанова, Б.М. Исина, Г.В. Муратбекова"Моделирование перевозок с помощью линейного программирования" Вестник КазАТК №4 2020г. С.109-117

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PROBLEMS OF INTRODUCTION OF DIGITAL TECHNOLOGIES IN TRANSPORT OF THE REPUBLIC OF KAZAKHSTAN

Abstract. One of the derivatives of the fourth technological revolution (industry 4.0) is the digital economy. The main difference between the current economy and the digital one is that in the former, GDP is the main indicator for evaluating its effectiveness. The implementation of the Digital Kazakhstan program implies the widespread introduction of digital information technologies to improve the lives of Kazakhstanis. Developed information and communication environments, IT incubators, e-government services, e-Commerce, digital libraries, blockchain

technologies, cybersecurity, electronic logistics, digitalization of transport and logistics infrastructure, smart cities and homes, and this is not the whole list of areas covered by digitalization. According to the objectives of the «Smart city» projects implemented in the regions of the Republic of Kazakhstan, smart roads in the near future will be able to provide residents of congested cities of Kazakhstan with a fairly high level of comfort. City authorities and businesses will be able to save money and improve the efficiency of all business processes, including the transportation process. The process of digitalization is currently an urgent issue and affects almost all countries of the world.

Keywords: Digitaization, industry 4.0, integrated transport logistics, gross domestic product, digital economy, transport corridor, transportation process.

Аңдатпа. Төртінші технологиялық революцияның туындыларының бірі (Индустрия 4.0) – цифрлық экономика. Қазіргі экономика мен цифрлық экономика арасындағы негізгі айырмашылық оның тиімділігін бағалаудың алғашқы негізгі көрсеткіші ЖІӨ болып табылады. «Цифрлық Қазақстан» бағдарламасын іске асыру қазақстандықтардың өмірін жақсарту мақсатында барлық жерде ақпараттық цифрлық технологияларды енгізуді көздейді. Дамыған ақпараттық-коммуникациялық орта, IT-инкубаторлар, электрондық мемлекеттік қызметтер, электрондық коммерция, цифрлық кітапханалар, блокчейн технологиялар, киберқауіпсіздік, электрондық логистика, көлік-логистикалық инфрақұрылымды цифрландыру, ақылды қалалар мен үйлер, және бұл цифрландыру қамтитын бағыттардың толық тізбесі емес. Қазақстан Республикасының өңірлерінде іске асырылып жатқан «Smart city» жобаларының міндеттеріне сәйкес, ақылды жолдар жақын болашақта Қазақстанның шамадан тыс жүктелген қалаларының тұрғындарын жайлылықтың жеткілікті жоғары деңгейімен қамтамасыз ете алады. Қала билігі мен бизнес барлық бизнес-процестерді, соның ішінде тасымалдау процесін үнемдеп, тиімділігін арттыра алады. Цифрландыру процесі бүгінгі күні өзекті мәселе болып табылады және әлемнің барлық дерлік елдерін қамтиды.

Түйінді сөздер: цифрландыру, индустрия 4.0, интеграцияланған Көлік логистикасы, жалпы ішкі өнім, цифрлық экономика, көлік дәлізі, көлік процесі.

Аннотация. Одна из производных четвертой технологической революции (Индустрия 4.0) – цифровая экономика. Основная разница между нынешней экономикой и цифровой состоит в том, что в первой основным показателем для оценки ее эффективности служит ВВП. Реализация программы «Цифровой Казахстан» подразумевает повсеместное внедрение информационных цифровых технологий с целью улучшения жизни казахстанцев. Развитые информационно-коммуникационные среды, IT-инкубаторы, электронные государственные услуги, электронная коммерция, цифровые библиотеки, блокчейн технологии, кибербезопасность, электронная логистика, цифровизация транспортно-логистической инфраструктуры, умные города и дома, и это еще не весь перечень направлений, которые охватывает цифровизация. Согласно задачам проектов «Smart city», реализуемых в регионах Республики Казахстан, умные дороги в ближайшем будущем смогут обеспечить жителям перегруженных городов Казахстана достаточно высокий уровень комфорта. Городские власти и бизнес соответственно смогут сэкономить и повысить эффективность всех бизнес-процессов, в том числе и перевозочный процесс. Процесс цифровизации на сегодняшний день актуальный вопрос и затрагивает практически все страны мира.

Ключевые слова: цифровизация, индустрия 4.0, интегрированная транспортная логистика, валовой внутренний продукт, цифровая экономика, транспортный коридор, транспортный процесс.

Introduction. As with any strategy for the competitiveness of digital technologies in transport, there is no universal recipe. The economy of any developed country shows itself as a leader in the development and application of digital technologies in transport. Everything is

determined by the specific tasks of the state and solving the problems of the national industry market. For example, in Germany, which is becoming a pioneer of industrial technologies, industrial leadership is a priority. The development of high-tech industries has provided jobs for about 10% of the country's population [1].

The state encourages research, provides financial support for fundamental digital projects, creates a digital education system, standardizes and regulates the market for innovative technologies. In Japan and South Korea, the main innovations are born on the basis of traditional corporations (Samsung, LG, Toyota, Sony, Toshiba, SoftBank) that create the largest digital companies, for example in the field of online Commerce and ecosystems (Rakuten) and the creation of Internet messengers (Line, Kakao). In the United States, digitalization is developing on the startup ecosystem, which has allowed us to put on stream the production of innovations and their successful implementation in many areas of activity. Active investment by the private and public sectors in digital technologies has enabled the digital economy to reach 10.9% of gross domestic product (GDP) today. To implement innovations, financial instruments are being developed (venture capital financing, the business angels system, etc.). China demonstrates High growth rates of digitalization, almost at the level of the United States. Unfortunately, the Chinese statistics are not fully comparable to the world, but the obvious processes of innovative growth: Alibaba, Huawei, passenger transportation at speeds above 400 km / h, can be judged on the scale of implementation of promising digital technologies that work not only on the national but also on the international market [1].

The goal of digitalization is to provide the multi-million population of the Republic of Kazakhstan with new goods and services (for example, online retail), opportunities for online ecosystems and digital banking. The main guarantor of investment protection in digital technologies is the state. With the heterogeneous development of the digital economy, different forms and methods of its implementation in society, we can identify common signs of a successful transition to a new technological order: a specific problem that can only be solved using digital technologies, and large amounts of investment in innovative developments and digital infrastructure. In the digital age, this segment of emerging markets has a good chance of becoming a breakthrough leader in various areas, since instead of reworking the legacy infrastructure, digital services (educational, medical services, online retail, multimodal urban transport projects, etc.) are created from scratch [2].

Industry 4.0. one of the derivatives of the fourth technological revolution is the digital economy. The main difference between the current economy and the digital one is that in the former, GDP is the main indicator for evaluating its effectiveness. Enterprises first produce products, and then search for markets. Forecasting plays a key role in the new economy: first, the demand forecast is determined, then the supply is formed. In other words, product pairs are formed in real time. You can make a forecast of a sale or purchase, risk, or event. Thus, digitalization of the economy of the Republic of Kazakhstan in relation to management systems will allow more informed business entities to make the right decisions. The realities of the present day clearly demonstrate the increasing value of accurate forecasting based on mathematical models based on large amounts of data from the transportation process. For example, these features are used to get detailed information, for example, about the transport corridor, its reliability, in order to adjust the balance of supply and demand and reduce the cost of sales and logistics in transport. Note the following: the closer the time of the predicted event, the higher the probability that it will occur in maximum accordance with the received forecast of transport logistics.

The digital economy is the result of the transformational effects of new General - purpose technologies in the field of information and communication, and the digital economy is predictive and personalized. I would like to emphasize that the full transition to the new digital economy will be marked by a significant increase in the values of economic indicators-by several

times, and not by a few percent (the latter means only temporary optimization through Informatization).

Industry 4.0, which highlights the following components:

- complete digitization of space, subjects and processes;
- new material;
- new production;
- a new system of governance.

Digitalization of the transport sector abroad.

The issue of modernizing the transport sector occupies a serious position in many foreign strategies for the development of the digital economy.

Let's start with Singapore, where the Smart mobility project most clearly identifies options for solving the problem of digitalization of transport. For example, the document specifies the need for Analytics in three basic areas, which relate to operational planning, resource optimization, and the availability of relevant information in real time. As a Toolkit it is proposed to use ground-based sensors, demand management, simulation, predictive text and multimodal Analytics. According to the strategy, the digital transport system in Singapore will be based on driverless trains, robotic loaders, Autonomous truck columns, Autonomous taxis, short-term car and Bicycle rentals, personal mobility devices, and Autonomous buses. Security issues, anonymization and reidentification, usability and aggregation are among the expected challenges in the Smart mobility project [3].

In France, the profile strategy presents plans for the development of transport infrastructure, which contain investment programs for the future (IAP). Note that two of them involve significant financial investments (in the form of repayable advances)in new aircraft designs of the Airbus Group. IAP programs include support for R & d projects. In particular, in the space sector, investment programmes have helped Finance research related to the development of new-generation launchers and new telecommunications satellites. The "Vehicle of the future" program mobilised road, sea and rail transport for the purpose of technological structuring of relevant industries related, in particular, to the production of starting mechanisms (thermal, hybrid or electric), as well as to weight reduction and the development of Autonomous vehicles.

In addition, the «vehicle of the future» program in the context of IAP has made a significant financial contribution to the creation of an electric gas station system for cars and to the modernization of the ferry fleet in France. In addition to this program, road, rail and sea modes of transport, as part of the implementation of the concept of reasonable mobility and logistics, should receive:

- assistance with research and collaborative testing tools;
- support for joint development projects;
- support in the field of intelligence through research organizations;
- auxiliary tools related to the production process, as part of the industrial production modernization program towards the «Factory of the future».

Concluding a brief overview of French solutions, it should be noted that the technological roadmaps for these sectors are part of the «New industrial France» program – «Environmental mobility» and «Transport of tomorrow». The program provides assistance to R & d projects and includes the following items [4]:

- continue to work on research and development programs for key players (major car manufacturers and suppliers, shipbuilders and railway workers) to produce vehicles in the context of increased technical requirements, including intelligent vehicles (Autonomous and connected);
- continued targeted support for innovation by small and medium-sized enterprises;
- continued support for vehicle testing and deployment of infrastructure for Autonomous vehicles.

The strategic plans for the development of the Australian transport system indicate that technological innovations in the transport sector will help to increase the efficiency, productivity and safety of transport, and reduce its negative impact on the environment. Increasing access to large amounts of data makes it possible to obtain more accurate analysis results for the joint work of the public and private sectors of the economy. For example, road cameras and sensors provide effective infrastructure management by detecting congestion and road work, sending warnings to motorists, and re-routing routes. This reduces travel time, reduces the amount of fuel and energy consumed, and allows for more efficient use of existing infrastructure. By the way, Rio Tinto unmanned trucks have already transported more than 100 million tons of land in the Pilbara [5].

In the UK, one of the main objectives of the transport infrastructure development strategy is to increase the level of Wi-Fi coverage of passenger transport. It is assumed that by 2018. almost all passenger vehicles (about 90 %) will have Wi-Fi access.

At the same time, there is significant cellular coverage on highways – 97% of the voice coverage provided by existing operators. However, in the future, it is necessary to improve the quality of the connection so that consumers can quickly receive messages about problems on the road, as well as for the proper functioning of new technologies such as connected and Autonomous vehicles, intelligent highways [6].

In the United States in November 2017. the public discussion of the strategic plan for the development of the transport industry for the period 2018-2022 has ended, where four components are at the forefront: security, infrastructure, innovation and manageability.

Security involves improving the efficiency of public-private partnerships, taking into account the human factor, improving data analysis for decision management, ensuring automation, and developing performance-based regulation.

Digital logistics in the Republic of Kazakhstan.

According to official data of the statistics Committee of the Ministry of national economy of the Republic of Kazakhstan (CS MNE RK), in 2018, the transport industry provided Kazakhstan with 8.3% of the total GDP produced (about 58.8 trillion tenge was the GDP of the Republic by production method). Over the past year, about 4.1 billion tons of cargo were transported across the territory of Kazakhstan, which is almost twice as much as a decade ago. Overall, the country's cargo turnover increased from 369.8 billion tkm to 596.1 billion tkm between 2008 and 2018, an increase of 61%. It is obvious that the increase in the volume of cargo transportation by heavy trucks, container transportation mainly by rail is an important link in the trade turnover in the Eurasian economic Union (EAEU) with the countries of the East Pacific region. In particular, with China, such cargo flows are carried out on the basis of e-commerce technologies, which indicates the development of digitalization in the transportation process [7]. To date, the implementation of projects on the shortest routes that connect Europe with East Asia is due to the construction of concrete roads of the Republic of Kazakhstan with a total length of 10.7 thousand km. The increase in the volume of cargo transportation in Kazakhstan by road from 2019 was made possible by the completion of the construction of the "Western Europe – Western China" Expressway, which has already been christened as the"New silk road". As the dynamics show, the road already contributes to the GDP growth of several Kazakhstan regions: Aktobe, Khromtau, Aralsk, Baikonur, Kyzylorda, Shymkent, Taraz, Kordai, Almaty and Khorgos. It is worth noting that the analysis of the main indicators in the regional context in recent years has identified the leaders in cargo transportation in Kazakhstan. Thus, the Karaganda, East Kazakhstan and Kostanay regions accounted for almost 44% of the total cargo transported in the country. It is also important to note that due to the trade turnover between China and Europe, the budget of Kazakhstan has been significantly replenished through transport corridors. Due to cargo transportation by land from China to Eastern Europe, under the basic scenario of development of some regions until 2025, the GDP of the designated regions of Kazakhstan may increase by an average of 12-15%. However, there are more optimistic

forecasts. Thus, according to the state program «Digital Kazakhstan», with the further development of the integrated transport and logistics infrastructure, the country's GDP due to cargo transportation in Kazakhstan will grow by an average of 5% annually.

Today, one of the key issues on the agenda of the Eurasian economic Commission (EEC) is the digitalization of integrated transport and logistics infrastructure in all regions of the country. For members of the Commission, the implementation of this initiative of the Republic of Kazakhstan in the EAEU is possible due to digital technologies and elements of «Industry 4.0» (Internet of things, 3D printing, physical signal processing technologies, business process automation, etc.). it is Noteworthy that the integrated transport and logistics infrastructure, which includes management of unmanned cargo transportation, warehousing, video surveillance, etc., already uses such systems and this system already justifies its application. Investments in technologies, especially in complex transport and logistics infrastructure, which have competitive advantages, can bring particularly tangible results to the economy of Kazakhstan and the EAEU member States. So, for example, the introduction of digital technologies in transport such as the «Internet of vehicles» could contribute to borrowing the best practices of foreign countries such as the USA, France, China, England, Germany, Japan, etc. It should be recognized that the development of IT technologies in comparison with Western countries, Japan and the United States in many sectors of the Kazakh economy was insufficient, Because we did not have time to invest in those technologies that are already outdated. It is obvious that it is important to carry out digital modernization in the integrated transport logistics industries as soon as possible. Since the competitiveness of the economy of Kazakhstan and, consequently, the well-being of the citizens of Kazakhstan directly depend on this. According to the state program «Digital Kazakhstan», the growth of labor productivity in the section «Transport and warehousing» in 2022 should be about 21%.

Data from the Ministry of national ECONOMY of Kazakhstan show that at the end of 2018, all modes of transport in Kazakhstan carried about 23 billion passengers per year (in 2008 – 11.3 billion), and the total passenger turnover for the year amounted to 281.5 billion passenger-km. It is worth noting that in 2008, passenger traffic was 127 billion passenger-km (an increase of 121%). It is expected that due to the digitalization of transport infrastructure facilities of the EAEU member States, traffic volumes will increase several times, which will affect the unprecedented growth of Kazakhstan's GDP.

Conclusion. Digitalization in the transportation process and the creation of a developed Eurasian, in particular, Kazakhstan's road network are beneficial to all-both Kazakh companies, citizens, and the economy as a whole. I would like to believe that getting consumers comfortable public transport and safe roads will be a guaranteed bonus of digitalization of the Republic of Kazakhstan. Kazakhstan has a good potential for cooperation between business and scientists, and it is likely that the digitalization of the transport system, especially the digitalization of the integrated transport and logistics infrastructure, will enable the government to curb the growth of prices for food, consumer goods and public transport. Reducing transport costs for carriers, as well as simplifying the logistics chain for the sale of goods and services of domestic producers of the Republic of Kazakhstan, opening up new markets, will be possible through the expansion of the road network in Kazakhstan and the development of integrated transport logistics.

REFERENCES

1. PwC, 2016 Global Industry 4.0 Survey, 2016.

2. The Global Information Technology Report 2016. Geneva. World Economic Forum, Cornell University, and INSEAD, 2016. - URL: https://www.weforum. org/reports/the-global-information-technology-report-2016.

3. Howe-Teo R. Singapore's Smart Mobility 2030: Big Data and Car-Lite Society. URL: https://www.nscs.gov.sg/public/ download.ashx?id=1005.

4. Présentation du 3e Programme d'investissements d' avenir. URL: http:// www.gouvernement.fr/sites/default/files/ contenu/piece-jointe/2016/06/pia3vl.pdf.

5. Digital Australia: State of the Nation The 2017 edition. URL: https:// digitalaustralia.ey.com.

6. Transport Investment. Moving Britain Ahead. Presented to Parliament by the Secretary of State for Transport by Command of Her Majesty. URL: https:// www.gov.uk/government/uploads/ system/uploads/attachment_data/ file/624990/transport-investment-strategy-web.pdf.

7. Balgabekov T.K., S.K. Mazhitova, Koshmagambetova A.S. The essence of logistics, functions, and ways to optimize logistics delivery. Materials of the International scientific and practical conference «Science and modern society: new interests, vectors of movement, development priorities», Karaganda, KEU, 2018. pp. 353-355.

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ҚОРШАҒАН ОРТАНЫҢ ӘРТҮРЛІ ФАКТОРЛАРЫНЫҢ ӘСЕРІН ТАЛДАУДЫҢ АВТОМАТТАНДЫРЫЛҒАН ЖҮЙЕСІН ҚҰРУ

Аңдатпа. Қала бойынша, жалпы, ауа құрамының өзгеруінен тұрғындардың тыныс алу органдарының бұзылуы жиі кездесетіндіктен, ауаның сапасын бақылап отыру қажеттігі туындайды. Қоршаған орта әсерін бірден жойып тастау мүмкін емес, алайда, дамыған озық технологиялар мен әдістерді қолданып олардан қорғануға, сақтануға және болжам жасай отырып, қауіптің алдын алуға болады. Зерттеудің мақсаты қала тұрғындарының денсаулығына қоршаған орта әсерінің талдауын жасау және қоршаған ортада ауа сапасын бақылап отыруға арналған автоматтандырылған жүйе құру, ластану дәрежесінің болашақта өзгеруін болжау болып табылады. Зерттеу пәні – экологиялық факторлардың денсаулыққа әсері, талдау жүргізуді бағдарламалық қамтамасыз ету, нейронды желілермен болжам жасауды оқыту. Зерттеудің нәтижесінде MatLAB бағдараламалау ортасында ауа құрамындағы ластаушы заттарға талданды, болашақта мүмкін болатын өзгерістерге болжам жасалды. Әрі қарай, талдауды негізге ала отырып, “Таза ауа” қосымшасы ұсынылып отыр.

Түйінді сөздер: экологиялық факторлар, қоршаған ортаның кері әсерін талдау, тұрғындар денсаулығы, автоматтандырылған жүйе, LSTM нейронды желісі, MATLAB, Flutter and Dart.

Аннотация. В целом по городу из-за изменения состава воздуха часто возникают нарушения органов дыхания населения, возникает необходимость контроля качества воздуха. Воздействие окружающей среды не может быть устранено мгновенно, однако, используя передовые технологии и методы, которые были разработаны, можно защитить, обезопасить и предотвратить угрозу, делая прогнозы. Целью исследования является проведение анализа воздействия окружающей среды на здоровье населения города и создание автоматизированной системы контроля качества воздуха в окружающей среде, прогнозирование будущих изменений степени загрязнения. Предмет исследования-влияние экологических факторов на здоровье, программное обеспечение для проведения анализа, обучение прогнозированию нейронными сетями. В результате исследования MatLAB был проанализирован на содержание загрязняющих веществ в воздухе в