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THE HISTORY OF DIGITIZATION OF MODERN KAZAKHSTAN IN THE CONTEXT OF THE GLOBAL CHALLENGE: ANALYSIS AND COMPARISON

The history and importance of the development of the «problem of digitization» and «smart city» are discussed as the subject of the article. In this study, the concept of «smart city» is considered as a general vector of further socio-economic development of cities. To reveal the historical aspect of the topic, historical reviews of the digitalization process of countries such as Singapore, Japan, and the USA are given. At this point, research methods: control and mixed methods are used. Using the methodology of qualitative analysis as a research methodology, the author compares the new digitization methodology, its development, developed in domestic discourse, with world experience. The authors come to the conclusion that the transfer of the state management system to a digital format serves as a means of developing the state's national interests and raising its image in the international arena. Today, the main task is to create conditions for the development of all types of cities, to ensure the uniformity of the economic and social development of the country's territories at the expense of increasing their competitiveness. Here, not competition, but competition, interaction and mutual aid relations based on the effective use of limited resources, primarily intellectual resources, play a decisive role. The practical importance of the article is to study the history of the complete digitalization of Kazakhstan and put the data into use. The research article will be useful and relevant for all readers who are studying the history of development of modern Kazakhstan or who are studying the humanitarian field.

Key words: History of digitization, Global digitization process, Digitized Kazakhstan, Smart city, Transformation, Innovation.

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Жаһандық сын-қатер жағдайындағы қазіргі Қазақстанның цифрлану тарихы: талдау және салыстыру

Мақала пәні ретінде «цифровизация мәселесі» мен «ақылды қаланың» даму тарихы мен маңыздылығы талқыланады. Аталмыш зерттеуде «ақылды қала» тұжырымдамасы қалаларды одан әрі әлеуметтік-экономикалық дамытудың жалпы векторы ретінде қарастырылады. Тақырыптың тарихи тұсын ашу үшін Сингапур, Жапония, АҚШ секілді елдердің цифрлану үдерісінен тарихи шолулар келтіріледі. Осы тұста зерттеу әдістері: бақылау және аралас әдістер қолданылады. Зерттеудің методологиясы ретінде сапалық талдау әдістемесін пайдалана отырып, автор отандық дискурста қалыптасқан жаңа цифрландыру әдістемесін, оның дамуын, әлемдік тәжірибемен салыстырады. Авторлар мемлекеттік басқару жүйесін сандық форматқа көшіру жолын мемлекеттің ұлттық мүдделерін дамытуға және халықаралық аренада имиджін көтеру құралы ретінде қызмет етеді деген қорытындыға келеді. Бүгінгі таңда барлық типтегі қалаларды дамыту үшін жағдай жасау, өздерінің бәсекеге қабілеттілігін арттыру есебінен ел аумақтарының экономикалық және әлеуметтік дамуының біркелкілігін қамтамасыз ету басты міндет болып табылады. Бұл жерде бәсекелестік емес, шектеулі ресурстарды, ең алдымен интеллектуалды ресурстарды тиімді пайдалануға негізделген бәсекелестік, өзара әрекеттесу және өзара көмек

қатынастары шешуші рөл атқарады. Мақаланың практикалық маңыздылығы Қазақстанның толық цифрлану тарихын зерттеп, деректерді қолданысқа енгізу. Зерттеу мақаласы гуманитария саласы бойынша білім алып немесе заманауи Қазақстанның даму тарихын зерттеп жүрген барлық оқырманға пайдалы әрі өзекті болмақ.

Түйін сөздер: цифрлану тарихы, әлемдік цифрлану үдерісі, цифрланған қазақстан, ақылды қала, трансформация, инновация.

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История цифровизации современного Казахстана в условиях глобального вызова: анализ и сравнения

В данной статье обсуждаются история и значение развития «проблемы цифровизации» и «умного города». В этом исследовании концепция «умный город» рассматривается как общий вектор дальнейшего социально-экономического развития городов. Для раскрытия исторического аспекта темы даются исторические обзоры процесса цифровизации таких стран, как Сингапур, Япония и США. На этом этапе используются методы исследования: наблюдения и смешанный вид исследования. Используя методологию качественного анализа для исследования, автор сравнивает новую методологию цифровизации, ее развитие, развивающееся в отечественном дискурсе, с мировым опытом. Авторы приходят к выводу, что перевод системы государственного управления в цифровой формат служит средством развития национальных интересов государства и повышения его имиджа на международной арене. Сегодня главной задачей является создание условий для развития всех типов городов, обеспечение равномерности экономического и социального развития территорий страны за счет повышения их конкурентоспособности. Здесь решающую роль играет не конкуренция, а конкуренция, взаимодействие и отношения взаимопомощи, основанные на эффективном использовании ограниченных ресурсов, прежде всего интеллектуальных. Практическая значимость статьи заключается в изучении истории полной цифровизации Казахстана и использовании полученных данных. Научная статья будет полезна и актуальна для всех читателей, изучающих историю развития современного Казахстана или изучающих гуманитарную сферу.

Ключевые слова: история цифровизации, глобальный процесс цифровизации, цифровой казахстан, умный город, трансформация, инновации.

Introduction

Every day, humanity undergoes global changes and gets acquainted with new technologies and means of communication. This global digitization did not fail to affect the economy, state, science and education, quality of life and security issues. Digital technologies have brought significant changes to social life, politics, and the larger economy. Compared to the situation 15 years ago, we can see that the digitization system in Kazakhstan has gained momentum. This should be understood as a requirement of the times. States that have not been able to keep up with global changes are likely to be out of competition and have a significant negative impact on macro-micro economic development. That's why every state is now busy with digitization and improving the conditions of the people. The

concept of creating a multi-cluster of areas means that the development of a «smart city» requires clear planning that has a direct impact on infrastructure, spatial development and innovation management. The development of intra-urban planning in this direction can help cities to integrate innovation more quickly at inter-regional and international level. The idea of a 'smart city' has a multifaceted history and is a response to modern challenges such as urbanisation, environmental problems and the need for effective management of urban resources to improve the quality of life of citizens. During the 1990s and 2000s, with the rapid growth of information technologies, the concept of the smart city began to develop. The term 'smart city' first appeared in 1998 (Antopoulos, Vakali 2012). The design of a 'smart city' emerged in the first decade of the 21st century, the information and

communication technologies (ICTs) developed to a level that enabled city governments to optimize urban processes. Internet resources confirm this. Although ideas about the relationship between technology and the urban environment arose much earlier, modern concepts of smart cities began to actively develop since the early 2000s. Singapore has been actively developing and implementing the smart city concept for many years. The city-state aims to become a smart city internationally, using the latest technologies to improve the lives of its citizens and optimize urban infrastructure. Here are a few ways Singapore is implementing its smart city vision: for example Singapore is actively using Internet of Things technologies and big data analytics to monitor and manage urban infrastructure, including transport, energy supply and waste management. Traffic management systems, smart parking, automated toll systems and other technologies are used to reduce congestion and improve the efficiency of the transport system. As mentioned above, the state of Singapore, a developer and creator of new technologies, builds various innovative, inclusive towns for its citizens as residences or business centers, and further supports the state's strategic development. The South Korean government has also developed a national strategy to promote the concept of smart cities across the country, including investing in innovative projects and supporting local smart city initiatives. Pangyeo Tech Valley, located near Seoul, is a center of innovation and development in the field of smart technologies. Many startups and technology companies working on smart city projects are located here (Antopoulos, Tsukalas 2006).

However, the ideas of «smart» management of urban systems existed before that – in the form of automated systems for managing various aspects of urban infrastructure. The first cities that became sites for experiments in this area included, for example, Songdo in South Korea, Masdar in the UAE, and some neighborhoods of large Western cities. The development of sensor technology and the Internet of Things has made it possible to collect large amounts of data for real-time analysis and decision-making, enabling the key elements of a smart city. Analytical tools have become more powerful, allowing huge amounts of data to be processed to improve city services and operations. With the development of cloud-based solutions, it has become possible to centrally manage a variety

of city systems. Advances in mobile technology have enabled citizens to interact directly with city infrastructure and services. Dubai is launched an ambitious plan to fully digitalize city services and infrastructure. Copenhagen uses technology to monitor and improve the city's environmental situation. The smart city concept continues to evolve, adapting to new technological trends and socio-economic conditions. It is an integrated approach that includes not only technology, but also citizen participation, planning and policy decisions. As the whole world knows, Singapore is one of the most technologically advanced and innovative countries. At the same time, it indicates that the training and education system is of high quality (Shalbolova, Kenzhegalieva 2018).

While the term «smartest» is subjective and dependent on criteria, its reputation is based on several factors, including its education system. This country consistently ranks highly in global education rankings such as the Program for International Student Assessment (PISA). The government heavily invests in education, prioritizing both academic and technical skills, with a global perspective. Singapore's education system is intended to produce global citizens, as highlighted by the teaching of English, Mandarin, Malay, and Tamil. Singapore's pioneering Smart Nation program aims to advance the use of digital technology and innovation in several fields. Singapore is a global leader in financial technology, attracting start-ups and investors from all over the world. Efficient governance and planning are in place. Singapore is renowned for its effective, transparent and visionary governance, frequently harnessing technology to improve public services. Urban Planning that city-state utilizes intelligent technology to manage its limited space, such as intelligent traffic systems, waste management and water treatment facilities.

There was a lot of information about such a large country. High-speed Internet, the scale of public transport, the ability of working people to work from different angles using new technologies, the schedule and salary will certainly surprise. In this article, considering the issue and history of Smart City, we focused on the mentioned country and tried to provide as much information as possible. Efficient governance and planning are in place. Singapore is renowned for its effective, transparent, and visionary governance, frequently harnessing technology to improve public services.

Materials and methods

The research focuses on examining Kazakhstan's digitalization process and determining its present popularity on international arena. Data for research is primarily collected from the «google scholar» database. These articles detail specific studies in which the authors conduct experiments and collect and analyze data. Often their purpose is to test a hypothesis or evaluate the effectiveness of new technologies and methodologies. Academic journals were also examined like Journal of Urban Technology, Smart Cities, Journal of Smart Cities and Society are some of the journals that regularly publish articles on smart cities. Studying these articles can provide deep insight into the current state of research, opportunities, and challenges in the smart city field. Data organization transcribing interviews, taking detailed notes and otherwise preparing data for analysis. Coding identifying recurring themes or patterns and tagging parts of the data accordingly. Interpretation exploring what the coded themes mean in the context of the research questions. The collected materials related to Kazakhstan undergo both quantitative and qualitative content analysis. Quantitative analysis aids in identifying trends and patterns across the media landscape. Qualitative text analysis delves deeper into the contextual nuances, tones, and underlying narratives within the media content. This combined approach enables a thorough understanding of how Kazakhstan is portrayed and perceived internationally. In addition, the websites of the ministry and special applications were considered. Comparative and dialectical-logical approaches have been used to study international experience in the development of smart cities.

Results and Discussion

Many experts have advocated for the automation and integration of technology into human life. Japan is widely regarded as the birthplace of advanced technology throughout history. In fact, Ken Sakamura, a professor from Japan, invented the first smart home in the 1980s. His goal was to construct a sensor house. For instance, regulating the temperature of the house and adjusting the volume of the TV. Following Sakamura's lead, billionaire Bill Gates began to develop «smart buildings». Now, let us address the issue of Kazakhstan. As a developing country, Kazakhstan cannot be

compared to technological giants, whose history was previously discussed. However, our country has entered a new century and has begun to implement various ambitious strategic plans. One such plan is the state project «Digital Kazakhstan». The government program was launched on December 12, 2017. This program provides a range of digital services, including 3D-printing, mobile-online banking, and full digitization of healthcare, social, and educational systems. These industries have given a new dimension to traditional industries and have already transformed the economies of developed countries. With the purpose of enhancing the quality of life of the people of the Republic of Kazakhstan and digitising the national economy, the state programme 'Digital Kazakhstan' was launched. The aim of the document was to raise the number of internet users to 80% by 2020 and to provide digital communications to 95% of the population of the Republic of Kazakhstan. Additionally, it aims to improve the digital literacy of citizens to 80%. (datareportal.com, 2023). This ambitious program is designed to modernize different aspects of society and the economy by embracing digital technologies. The overall goal is to make Kazakhstan a competitive player in the global digital arena while also improving the quality of life for its citizens through technological advancements. The government of Kazakhstan has been investing in digital infrastructure as part of broader efforts to modernize the country and diversify its economy. Digital literacy was at a low level in our country. This situation still persists. If we review the issue of cyber security, it is known that there were several cases at the beginning of the year. The spread of personal information of Kazakhs to China, as well as various cyber attacks, have often occurred. Within the framework of this program, 80 percent promised to create cyber defense. But as the research shows, it seems that we have not reached this indicator (Digel, 2022). The «Digital Kazakhstan» initiative concentrates on the industrial trajectory of the digitalization of the economy. Incorporating digitalization into current business models enhances their economic performance in the global market. Digitalization has significantly impacted public administration, medicine, education, and many large and medium-sized businesses in Kazakhstan. These are various enterprises in industry, energy, transport, logistics, agriculture, financial technology, and other entrepreneurial sectors.

Digitization presents significant opportunities for the business environment, including access to new markets and channels, innovative technologies and ideas, and the ability to increase productivity and make more efficient use of technical resources. Therefore, digitalization can be viewed as a new evolutionary phase in the industrial transformation of the Kazakhstani economy. The realization of digital change is leading to a new era of industrial transition, empowering organizations to control their businesses, improve their effectiveness, expand their business plans and interact with their customers in the digital space. In this paper, the authors discuss the impact of digitalization on economic indicators and evaluate it as a metric for measuring the effectiveness of driving technological progress in various sectors of the economy (Mukanov, 2023). Social media platforms are popular in Kazakhstan, and there has been a notable increase in the use of online services for a variety of purposes, from e-commerce to accessing government services. However, it's worth noting that there have been concerns about internet freedom in the country, including instances of website blocking and restrictions on online content. During the creation of the government program «Digital Kazakhstan» the experience of many

civilized and developed countries was used. They are countries such as Austria, Denmark, Australia, Canada and Singapore, which have made significant progress in the implementation of digital technology. For example, the «digital» principle of planning is used in the preparation of the city financial budget in Vienna, the capital of Austria. As a result, it helps to save two million euros in the budget of Vienna, the capital of Austria. And Boston in the United States has a special mobile application for monitoring utility services. Since its implementation, the complaints of residents of the Republic of Kazakhstan have decreased by sixty-six percent (Qamshy.kz 2023). DataReportal claims that in the beginning of 2023, Kazakhstan had 17.73 million internet users, with an internet penetration rate of 90.9%. In January 2023, 11.85 million people in Kazakhstan used social networks, representing 60.8% of the total population. Additionally, there were 25.44 million mobile phone users in Kazakhstan, which is 130.5% of the total population. (www.stat.gov.kz 2023) Consideration of the program's framework, necessary to reach 80 percent by 2020, it seems that Kazakhstan has achieved this result. The components and main objectives of a smart city vary. However, the table presented below outlines the principal components.

Table 1 – In this drawing, we have shown the main objects and components of a smart city.

Key Objectives:	Key Components:
To establish a resilient digital infrastructure that can provide fast and dependable internet access throughout the nation, including remote and rural regions.	Data Centers: Building secure and efficient data centers to host various digital services.
E-Government: To improve governance by introducing digital tools and platforms that will make government services more accessible and efficient for the citizens.	Cybersecurity: Establishing strong cybersecurity protocols to protect digital assets and user data.
Human Capital: To prepare the population for the digital future by offering educational programs focused on digital literacy, programming, and other essential skills.	Public Services: Digital platforms to provide public services such as healthcare, education, and public transportation.
Innovation: To foster a culture of innovation by supporting startups, creating tech parks, and encouraging public-private partnerships in technology sectors.	Public Services: Digital platforms to provide public services such as healthcare, education, and public transportation.
Economy: To boost the digital economy by encouraging businesses to adopt digital technologies for more efficient and sustainable operations.	Smart Cities: Implementing smart city projects to make urban living more efficient, safe, and sustainable. Legislation: Laws and regulations that support and guide digital transformation are being introduced or updated.

It will be a great success if work is done in such conditions for the cities of Kazakhstan in general. Because the situation in rural areas of the country is not good. In the last note, we believe that special attention should be paid to the word law and supervision. Then, in addition to big cities, districts, regions and regions will develop together (Basteler, 1998). E-government, an abbreviation for electronic government, pertains to utilizing digital technology to dispense government services and manage public resources. It encompasses not only online platforms for service delivery but also the unification of different information and communication technologies (ICTs) into government operations. The goal of e-government is to enhance the transparency, efficiency, and convenience of interactions between citizens and government. Information and Communication Technology (ICT) refers to the technologies that allow access to information through telecommunications. This includes the Internet, wireless networks, mobile phones, and other communication media. At this point there is no need to fear ICT. Young people and old people live together in the state. It is clear that it is dangerous to put all types of services and information exchange on the Internet. For that, ICT will carry together traditional and new information technologies. It includes radio and television, computer and satellite systems and similar applications.

It has become an essential part of daily life, contributing to economic development, social interaction, and technological advances. As part of the digitisation process, Kazakhstan has launched several pilot programmes. The state spends a lot of money on the cities of Astana and Almaty for the development of the country. One of them is construction of smart houses in Astana, preparation for the Expo. On the one hand, it is the capital of the country, and many guests from all over the world come to this city. This project was undertaken to create a new brand. Astana's Smart City project plan includes the successful implementation of the Smart Astana brand. The principal objective is to support the authorities in the implementation of innovative solutions that can have a significant impact on the country as a whole and in the promotion of economic diversification. This can be achieved through various means, such as fostering entrepreneurship and encouraging the development of new industries. By providing resources and expertise, the authorities can create an environment conducive to innovation and attract both local and foreign investment. Obviously, within the framework of this project, it was believed that the creation of new jobs for citizens would lead to an

increase in the economy, an increase in dependence on one industry or sector. Another important point is that the construction of innovative, inclusive places can solve both social and environmental problems, contributing to the sustainable development of the country and improving the quality and level of life of the Kazakh people.

The Smart Astana project describes a roadmap that specifically targets six key conditions: Smart Economy, Smart Management, Smart Living, Smart Travel, Smart population and Smart Environment and nature. Another important information to mention at this point. As part of another pilot program, more than 15 thousand houses in 17 regions of Kazakhstan were supplied with heat, water and electricity metering devices were installed. But these are ordinary social needs. The smart city does not want to be attributed to the scope (www.stat.gov.kz 2023) The move towards digitisation is contributing to the expansion of tourism in Kazakhstan. As per the expert, the number of accommodation options in the country has increased since 2017, including hotels, hostels, and eco-camps. In 2017, there were around 2,700 to 2,800 accommodation options, whereas this year has seen a rise to 3,700. Consequently, in the space of five years, the total number of accommodations has risen by 1,000. The interview with the expert revealed unique projects are in place in the country that have no international equivalent, along with a domestic tourism monitoring system. One such system is the «e-qonaq» system, alongside the National portal «Kazakhstan Travel.» The «e-qonaq» system can scan passports from 190 countries in a single second. This «electronic guest» system works in tandem with the National Security Agency and the Ministry of Internal Affairs to track foreign guests arriving in the country. «That is, the «e-qonaq» system is considered very suitable for statistical analysis in determining the numbers and origin of foreign tourists, according to experts. This system has garnered great interest from the countries of Georgia and Azerbaijan, both of which have made offers to purchase it. The «e-qonaq» is an information system for collecting and accounting tourist flow and migration control. The introduction of the system improves the quality of tourist services and the attractiveness of domestic hotels, as well as improves control over compliance with the migration legislation of the Republic of Kazakhstan. The system was created as part of the implementation of the state program for the development of the tourism industry The Ministry of Culture and Sports with the assistance of the Ministry of Internal Affairs of the Republic of Kazakhstan (Eqonaq.kz 2022). Online tourism refers to the use of digital platforms and

technologies to enable travel and tourism-related activities. This encompasses a broad range of services and features, such as researching destinations, booking flights, reserving accommodations, and planning itineraries, all of which can be carried out on the internet. Online tourism has significantly altered the dynamics of the travel industry, providing consumers with a broader range of options and information that are more accessible when planning and booking trips. Kazakhstan, as a developing nation with numerous regions, is in the early stages of transitioning towards digitalizing cities and implementing local solutions. Nonetheless, some cities and regions in Kazakhstan have exceptional infrastructures necessary to establish a «smart» city. As a result, Kazakhstan must keep up with global trends, including the worldwide digitization of communities, urbanization, and the growing significance of cities (www.stat.gov.kz 2023).

Conclusion

Summarising the research, it is necessary to promote all the aforementioned areas through periodical press and media. Currently, «New Kazakhstan» is a captivating topic globally.

From the beginning of 2022 until present day, roughly 2 million pieces of information have been disseminated, indicating an increase in interest towards Kazakhstan. And 90% of that vast amount of information is political. We previously mentioned the widespread optimism and approval for the country's recent reforms. If, within the following 7 years, the country achieves complete democratization, eradication of corruption, absolute freedom of speech and openness, we may ascend to the category of developed nations by 2030. It is worthwhile to strive to become a pioneer in the distribution of information. It is recommended to establish news agencies in English, and provide state-level support for them, employing proficient journalists and allowing them the freedom of expression. Additionally, the creation of PR videos and feature films that positively shape the nation's image should be increased. This strategy represents the most effective method of image creation in the 21st century. As the oft-repeated adage goes, a nation with a robust media is also powerful. This research was funded by the Science Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan (Grant No. AP14972830).

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Келіп түсті: 13.03.2024

Қабылданды: 22.05.2024