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Socio-Economic Assessment of Digitalisation of Municipal Services in Kazakhstan

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Abstract. *The relevance of the study is conditioned by the need to assess the impact of digitalisation and innovation on the financial stability and competitiveness of enterprises and regions in the context of modern challenges and transformations in the digital era. In this regard, this study was aimed at determining the efficiency and profitability of innovations in Astana, the capital of the Republic of Kazakhstan. The statistical method was chosen as the leading method of investigating this problem, which allowed conducting the necessary calculations to determine such indicators as the efficiency and profitability of innovations. The paper reveals the essence of digitalisation in the context of the modern economy, describes the concept of "Smart Astana" and reveals its characteristics concerning the development of six socio-economic areas. The study substantiates the importance of digitalisation of enterprises for the development of a sustainable economy of the state and provides statistical data on the introduction of innovations in business processes by enterprises of Kazakhstan in general and Astana in particular. Indicators of income increase and cost reduction of Astana enterprises due to the introduction of innovations were analysed, calculations of the profitability of innovations and the effectiveness of innovations in the region were carried out. The disadvantages of digitalisation were also identified and ways to overcome them were proposed. The research materials can be used in the preparation of management decisions and the creation of development strategies both for individual enterprises and for the overall region.*

Keywords: innovation efficiency; innovation profitability; sustainable development; competitiveness; digital transformation; business processes

JEL Codes: O3, O32, O38

1. Introduction

The investigation of the topic of digitalisation and its role in modern socio-economic development is becoming increasingly relevant, since over time digital technologies become the driving force for economic growth, improving the quality of life, and ensuring sustainable development. The study of this topic is of great importance, as it enables the understanding of how digital transformation can affect the future of Kazakhstan. The scope of the study is related to the need to adapt the country to the rapid pace of digital technology development, including the challenges associated with the deployment of digital infrastructure, providing access to high-speed Internet for all segments of the population, developing digital services and strengthening cybersecurity. It also includes issues related to the training of personnel in the field of information technology and the strengthening of innovation activities. The problem of digitalisation in Kazakhstan has begun to gain momentum in recent decades, and has become especially relevant with the launch of the Digital Kazakhstan programme, which was initiated by the state in 2017 and aimed at the active development and implementation of digital technologies in various spheres of society and the

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economy of the state (Sheryazdanova, 2020). During this period, the state faced both new challenges and new opportunities and prospects.

The study by Turekulova et al. (2023) was devoted to improving the indicators of socio-economic development of the regions of Kazakhstan. The analysis of data and trends allowed the researchers to identify factors affecting the level of development and well-being of the population, including factors related to infrastructure, education, employment, and investment. Kredina et al. (2023) analysed the current state and level of development of socio-economic indicators in the Abai region of Kazakhstan. The paper highlighted such key indicators as the GDP of the region, the unemployment rate, the availability of education and healthcare, the level of income of the population, infrastructure, and other factors affecting the quality of life and development. The assessment of the current socio-economic productivity and development of vulnerable and depressed territories in Kazakhstan was carried out by Kireyeva et al. (2022). As a result of statistical analysis, analysis of data on income, employment, access to education and healthcare, and social services, the researchers provided recommendations to improve the situation of vulnerable and depressed territories by developing infrastructure, supporting entrepreneurship, increasing access to education and healthcare, and improving access to financial services.

Digitalisation of the economy of Kazakhstan as a factor of innovative development of the country was considered by Zhanbayev et al. (2020). Analysing the processes of digital transformation in various sectors of the economy, researchers assessed their impact on stimulating innovation and modernisation and concluded that digitalisation contributes to the growth of innovation in the country. The study also positively assessed the effectiveness of current programmes and activities aimed at supporting innovation and stimulating research and development. The role of marketing in ensuring the competitiveness of Kazakhstan's regions in the context of the transition to the digital economy was investigated by Tovma et al. (2020). The main focus of the study was on marketing methods and strategies that can contribute to the successful adaptation of regions to new digital realities. The results of the study included an analysis of successful marketing practices in the regions of Kazakhstan, which were able to successfully attract investment, develop digital infrastructure, and stimulate digital transformation in their fields of activity.

In the reviewed papers, the topics of infrastructure, education, digital technologies and marketing strategies for improving the socio-economic development of the regions of Kazakhstan were revealed. However, it is important to note that the real effectiveness of digitalisation and its impact on the development of regions requires additional research and evaluation. In this context, the purpose of the study was to conduct a detailed analysis of the results of digitalisation and to assess how these changes have contributed to improving the quality of life and the level of well-being of the population.

2. Materials and Methods

This empirical study required the use of theoretical and practical methods of scientific cognition. The following methods were applied: statistical, systematisation, analysis, comparison, synthesis, deduction, and classification. The method of systematisation in this paper was used to deepen the understanding of the processes of digitalisation of enterprises in the context of the Republic of Kazakhstan and the city of Astana. The key indicators were analysed, including the costs of innovation and the indicators of enterprises for the introduction of innovations in the city of Astana. With its help, the challenges and tasks facing enterprises and authorities in the context of digitalisation were described.

The classification was used to divide Astana enterprises into groups according to whether they used innovations, and to estimate the number of changes in their income and expenses as a result of this use. The comparison allowed comparing indicators between groups of enterprises with and without innovations in

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Astana. This method of analysis identified the difference in average incomes and expenses between the two groups and allowed drawing conclusions about the impact of innovations on the economy of Astana. The statistical method was used to carry out the calculations necessary for the study. With its help, such indicators as the efficiency and profitability of innovations in Astana were identified.

Profitability of Innovation was calculated as the difference between the average income of enterprises with innovations and the average income of enterprises without innovations:

$$P_I = R_I - R_{NI}, \quad (1)$$

where: P_I – profitability of innovations; R_I – average income of enterprises with innovations; R_{NI} – average income of enterprises without innovations.

Efficiency of Innovation was defined as the ratio of the average income of enterprises with innovations from innovative products to the average costs of these enterprises for innovation:

$$E_I = R_I / C_I * 100. \quad (2)$$

where: E_I – efficiency of innovation (in %); R_I – average income of enterprises with innovations from innovative products, C_I – average cost of innovation.

Using the equations presented above, the profitability and efficiency of innovations in Astana were calculated: profitability amounted to KZT 3847.54 million, and efficiency – 75%. The analysis allowed evaluating the data obtained and interpreting the results of the study, to identify patterns between innovations and profitability/efficiency indicators of Astana enterprises. Thus, with the help of logical analysis, a deeper understanding of the impact of innovations on enterprises and the economy of the region was achieved.

The deduction was used to identify common patterns. With its help, generalised conclusions were formulated about how innovations affect the profitability and efficiency of enterprises in the city of Astana. The deduction helped to establish causal relationships between the introduction of innovations and the economic performance of enterprises, which provided a better understanding of the processes of innovative development in this region. Using the synthesis, all previously identified data and aspects of the study were combined into a complete picture, which contributed to a deeper understanding of the concept of profitability and efficiency of innovations in the region under consideration.

3. Results

Digitalisation is a key engine of modern society, providing improved efficiency of business processes, innovative developments (Björkdahl, 2020), improving people's daily lives, and preserving the environment (Mondejar et al., 2021). This transformation increases the availability of education and healthcare, reduces the negative impact on the environment, and expands the ways of communication and information exchange. Digitalisation creates new opportunities for economic growth and improving the quality of life, becoming an integral element of modern society and economy (Khan et al., 2025).

The concept of "Smart Astana" is based on the idea of creating a modern, innovative and efficient urban space that actively uses digital technologies and infrastructure to improve the quality of life of citizens, improve economic productivity and reduce the negative impact on the environment (Shalbolova and Kenzhegaliyeva, 2018). Based on this concept, the roadmap for achieving this idea includes six key characteristics:

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1. Smart economy aims to use digital technologies to support economic growth and diversity by creating innovative start-ups, developing digital infrastructure, supporting entrepreneurship, and improving business conditions.
2. Smart management is associated with the effective regulation of urban infrastructure and resources using modern information systems and analytics. It includes centralised monitoring and management of transport, energy supply, water supply, and security systems.
3. Smart life focuses on improving the quality of life of citizens and includes providing access to high-quality educational and medical services, creating comfortable housing, developing cultural and sports initiatives.
4. Smart mobility is associated with solving transport problems and creating innovative transport logistics systems through the development of integrated public transport systems, traffic management, public transport support, and the development of mobile applications for the comfort of citizens.
5. Smart people – this aspect of the concept is designed to develop education, skills, and raise awareness of citizens. It includes access to online education, support and development of innovative and scientific research, and strengthening cooperation between scientists and business.
6. Smart environment is associated with the creation of an environmentally sustainable urban environment in which effective resource management, emission reduction, and environmental cleanliness are carried out. This aspect includes measures to reduce air pollution, improve waste management, and create green public spaces.

Based on the consideration of the concept of "Smart Astana" and the analysis of data on the digitalisation of enterprises, it can be argued that digital technologies play a crucial role in the implementation of the concept of a smart city. The use of modern digital solutions, both in the field of urban infrastructure and in enterprises, contributes to the development of "smart" economy, management, mobility, life, environment, and quality of education (An et al., 2024; Khalegi et al., 2024).

Digitalisation of enterprises allows optimising production processes, improving the quality of products and services, and providing more efficient management of resources and finances (Zhivkova et al., 2024; Yudina et al., 2024). This, in turn, contributes to improving the overall competitiveness of the region, in a particular case, the city of Astana. Digitalisation of enterprises is a key tool in the implementation of the "Smart Astana" concept, leading to a more sustainable and prosperous economy, and improving the quality of life of the city's residents. Analysing data on the digitalisation of enterprises in the Republic of Kazakhstan and, in particular, in the city of Astana, it was revealed that at the country level by the end of 2022, there were 3390 enterprises that introduced innovations in business processes. Of these, the largest number of enterprises have introduced innovations in the development of products and business processes (809), information and communication systems (539), marketing and methods of selling goods (540). Logistics, delivery or methods of selling goods (532), administration and management (318) are also important. There were 633 enterprises in Astana that introduced innovations in business processes. Of these, the largest number of enterprises focused on the introduction of innovations in the categories of "Information and communication systems" (139) and "Marketing and methods of selling goods" (226). Another important aspect was the introduction of innovations in logistics, delivery or methods of selling goods (351).

Comparing these data, it can be noted that Astana, as the capital and a major economic centre, has a higher level of innovation in such areas as information and communication systems and marketing, compared with the national average, which may indicate a higher readiness and activity of enterprises in Astana in the field of digitalisation. The overall picture of the country and the city of Astana indicates the importance of developing and supporting innovations in business processes, especially in the field of

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information and communication systems and marketing, in order to promote digital transformation and increase the competitiveness of enterprises and regions.

Analysing the costs of innovation in Astana, it can be noted that Astana has implemented a substantial budget for innovation, amounting to KZT 45591.7 million. The largest costs were associated with the purchase of modern machines, equipment, software and other capital goods (KZT 21414 million). Significant amounts were also invested in internal research and development (R&D), including labour remuneration and capital investments in buildings and equipment (KZT 14763.8 million). Certain funds (KZT 3438.3 million) were also allocated to external R&D, which indicates the need to use external knowledge and resources for innovative development. Marketing research, design, and other activities also received significant investments (KZT 3438.3 million). The city of Astana has higher innovation costs compared to the national average (KZT 70444.3 million per region), which indicates the desire of the capital to actively develop and introduce innovations in various fields, including technology and marketing. These data indicate a significant attention to innovation processes both at the national level and in the city of Astana, which can contribute to sustainable growth and development in the future.

Analysing the indicators of enterprises implementing innovations in Astana, it can be highlighted that 59 enterprises (9.3% of the total number) from Astana reported that they had no increase in income as a result of the introduction of innovations. 561 enterprises (88.6% of the total) reported an increase in revenue in the range from 1% to 24%. 2 enterprises (less than 1% of the total number) reported an increase in income in the range from 25% to 50%. 1 enterprise (less than 1% of the total number) reported an increase in income by more than 50%. 185 enterprises (29.2% of the total number) from the city of Astana reported no cost reductions as a result of innovation. 438 enterprises (69.1% of the total) reported cost reductions ranging from 1% to 24%. 1 company (less than 1% of the total) reported cost reduction in the range of 25% to 50%. These data indicate that innovations in the city of Astana contribute, first of all, to an increase in the incomes of enterprises. This may be conditioned by the active development and modernisation of the city's economy, which, in turn, contributes to improving its competitiveness and attractiveness for business (Bureau of National Statistics, 2023).

Based on the available data, it was possible to analyse the profitability of innovations and their effectiveness. The average income of enterprises with innovations in Astana amounted to KZT 4218.39 million, and the average income of enterprises without innovations – KZT 370.85 million. Accordingly, the profitability of innovations in Astana amounted to KZT 3847.54 million. When calculating the effectiveness of innovations, the number of enterprises with innovations in Astana was taken into account, which is 633 enterprises, and the costs of these enterprises for innovations of all types (product and business processes), which amounted to KZT 45591.7 million. The volume of innovative products sold amounted to KZT 34179.7 million. Thus, the efficiency of innovations in the capital was determined at the level of 75%, that is, the average income of enterprises with innovations in this region is higher by so many percent compared to enterprises without innovations. Based on the calculations carried out, it can be argued that innovations in Astana are profitable and effective. These results emphasise the importance of innovation as a key factor contributing to the increase in profitability and competitiveness of enterprises in Astana.

Digitalisation has a significant positive impact on the social and economic aspects of urban households. The most significant of them is economic growth and increased productivity (Albukhitan, 2020). Since digitalisation improves the efficiency of production processes and the provision of services, this, in turn, increases the economic growth of a city or region, and the introduction of digital technologies into the business environment contributes to the creation of new jobs and stimulates innovation. Digitalisation can contribute to the development of a digital ecosystem, including start-ups and innovative companies, which creates jobs and attracts investment (Alnaimat et al., 2023; Mehdi, 2025). Digitalisation of urban households

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can contribute to the development of digital infrastructure, such as high-speed Internet connections, sensor networks, and transport management systems, which contributes to improving the living comfort of citizens (Zangiacomi et al., 2020). In addition, digitalisation allows urban enterprises to use resources more efficiently, such as energy, water, transport and others. Optimisation of city management processes, including smart management of transport and infrastructure, reduces operating costs.

Digital innovations can make cities more convenient and safer to live in (Issayeva et al., 2024; Piddubna et al., 2024). For example, health monitoring systems, smart lighting and automated security systems can improve the quality of life of citizens. Electronic government and commercial services can simplify access to services and reduce time and physical distances, help cities become more environmentally sustainable by reducing greenhouse gas emissions, optimising transport and energy management (Destek et al., 2024; Madiyarova et al., 2015). Digitalisation can make education and healthcare more accessible through distance learning, telemedicine, and other digital solutions (Barr Taylor et al., 2020). Thus, it is possible to highlight the advantages of digitalisation:

1. Productivity improvement: automation and optimisation of processes can improve the productivity and efficiency of businesses and government organisations.
2. Increasing accessibility: digitalisation can make services, education, healthcare and information more accessible through online platforms.
3. Sustainability and environmental friendliness: digital technologies allow reducing greenhouse gas emissions and optimise the use of resources.
4. Innovation development: digitalisation contributes to the creation and development of innovative companies, start-ups, and the digital ecosystem.
5. Improving the quality of life: smart cities, smart management of transport and infrastructure, and technologies for healthcare and education can improve the quality of life of citizens.
6. Effective city management: digital systems allow better management of resources, transport, security, and other aspects of urban infrastructure.

However, the introduction of digital technologies can also raise questions in the field of data security, privacy of citizens and inequality in access to digital resources. Therefore, it is important to balance digital transformation considering the interests and needs of different segments of the population and to ensure data protection and privacy.

The digitalisation process has a number of advantages, but also entails some disadvantages and challenges (Table 1).

Table 1. Disadvantages of digitalisation and ways to solve them

Disadvantages and challenges of digitalisation	**Practical steps and recommendations for solving these problems**
Cybersecurity and privacy: increasing the volume of digital data and interactions also increases the risks of cyber-attacks and privacy violations.	Cybersecurity: development and implementation of more advanced systems for protection, monitoring and response to cyber threats. Privacy: development and compliance with strict policies and standards for the processing and storage of personal data.
Infrastructure and accessibility: digitalisation is not always available or accessible on equal terms for all segments of the population, which can lead to digital inequality.	Infrastructure: investments in expanding digital infrastructure, including broadband access in remote and rural areas. Training and support: training and support for those who do not have access to digital technologies.
Dependence on technology: cities can become vulnerable to failures in digital systems or to technological changes.	Diversity of technologies: the use of a variety of technologies and architectures to reduce the risks of dependence on a single system, constant updating and adaptation to new technological

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	trends.
Threat to jobs: automation can lead to a decrease in demand for certain types of labour and to the loss of jobs.	Retraining and training: development of retraining and training programmes so that employees can acquire new skills and adapt to changes in the labour market. Supporting start-ups and innovations: promoting the development of innovative companies and sectors that can create new jobs.
Risk of data loss: data protection and backup are important to avoid data loss due to failures or attacks.	Backup: regular and reliable data backup and development of disaster recovery plans. Cyber insurance: consideration of the possibility of cyber insurance to protect against data loss.
Regulatory difficulties: from a legislative and regulatory standpoint, digitalisation requires the development and implementation of new rules and regulations.	Development of legislation: creation of transparent and modern legislation and regulation that contributes to the development of the digital economy. Cooperation with the private sector: interaction with the private sector in the development of norms and standards.
Digital disparity: not all of the population is ready or able to use digital technologies, which increases social inequality.	Inclusive programmes: implementation of inclusive programmes and projects to reduce the digital divide and ensure the availability of digital resources for all groups of the population. Subsidies and financial support: provision of subsidies and financial support for those who cannot afford access to digital technologies.
Ethical and legal issues: there are questions about the observance of rights and ethical standards in the field of digitalisation.	Code of ethics: development of ethical codes and norms in the field of digitalisation. Legal regulation: establishment of clear legal rules and regulations for data processing and digital activities.

Source: compiled by the authors.

Addressing these challenges requires joint efforts by the government, the private sector, educational institutions, and civil society. The key factor is a versatile approach and a balance between innovation and ensuring security, accessibility, and fairness.

4. Discussion

The issue of digital division in the world was considered in the study by Mubarak et al. (2020). The researchers analysed the relationship between socio-economic indicators and the process of digitalisation, and how socio-economic factors affect the availability and use of digital technologies. The paper examined various opinions on this issue, identified factors contributing to digital separation and possible ways to reduce this gap. The results and conclusions provided valuable information for the development of a policy in the field of digitalisation: they stressed the need to consider socio-economic aspects when creating digital development strategies and highlighted those areas where additional efforts are required to address the impact of digital division on social and economic inequality in the world. Comparing the results of this study with the previous one, there are general conclusions about the importance of taking socio-economic factors into account when designing digital development strategies to address the digital divide and socio-economic inequalities.

Li et al. (2020) analysed how the use of digital financial services, such as mobile payments, online banking and e-wallets, affects patterns and consumption volume among Chinese households. The study found that digital financial instruments influence the financial behaviour and consumer decisions of Chinese households, which included changes in the structure of consumer spending, the level of savings, and access

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to financial services and loans. The use of digital financial services in China stimulated the growth of consumer spending among households that actively used mobile payments, online banking and e-wallets. They spent more on goods and services while often reducing their cash costs. It is important to note that the successful use of digital financial instruments also depended on education and Internet access: households with a higher level of education and stable Internet access used digital financial services more actively. The results of this study complement the understanding of the impact of digital technologies on the modern economy not only from the standpoint of business, but also as an effective method of socio-economic development of society.

The relationship between the digital inclusive financial infrastructure and the consumption structure in rural areas of China has been investigated by Yu et al. (2022). The analysis showed that households that have access to digital financial services, including mobile banking and online payments, often change their consumer habits. With the development of a digital inclusive financial infrastructure, rural households have become more active consumers of goods and services, which may be due to more convenient access to financial resources that allow online payments, purchases and investments (Raiymbergenova et al., 2023; Makhazhanova et al., 2024). The study concluded that the development of a digital inclusive financial system can promote diverse and better consumption in rural areas, and can also contribute to economic growth and improve the lives of rural populations. The researchers also stressed the importance of developing digital infrastructure and financial inclusion in rural areas in order to reduce the gap between urban and rural populations and stimulate economic development in all regions. This study emphasised that access to digital financial services contributes to changes in consumer behaviour, including an increase in activity in the field of purchases and investments, while the study revealed the positive impact of innovation on the incomes of enterprises and the efficiency of the economy as a whole.

The study by Zhang et al. (2020) examined the relationship between the development of the digital economy, financial inclusion, and inclusive economic growth. It was revealed that the digital economy, which relies on information technology and digital platforms, can stimulate financial inclusion by increasing the availability of financial services through digital channels such as mobile banking and e-wallets, and financial inclusion, in turn, contributes to inclusive economic growth. This allows broad segments of the population, including low-income and remote communities, to access financial services, invest and receive loans, which contributes to the creation of new jobs, the development of entrepreneurship, and an increase in overall well-being. The study also revealed the importance of developing the right policies and regulations to ensure financial inclusion and inclusive growth in the digital economy era, which should include measures to ensure cybersecurity, data protection, and the creation of an enabling environment for the development of digital financial services. The link between the digital economy, financial inclusion, and inclusive growth is of great importance for the modern economy (Kuzmin et al., 2014). The study reviewed confirmed the idea that the development of digital technologies can contribute to sustainable and more even economic growth, considering the interests of all segments of society.

Dana et al. (2022) focused on investigating the impact of digital technologies on urban entrepreneurship and the development of sustainable business in smart cities. The article investigated how digital innovations and infrastructure contribute to business development in modern urban environments, where new approaches to the management and maintenance of urban infrastructure are applied. Successful cases of smart cities where entrepreneurs have used digital technologies to create innovative business models related to environmental sustainability and solving urban problems were discussed. The researchers came to the conclusion about the importance of digital technologies in supporting urban entrepreneurship and developing sustainable businesses in modern smart cities. The study described how digital innovations and infrastructure

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contribute to business development in modern urban environments, which was confirmed by the conducted research on the example of enterprises in Astana.

The importance and influence of digital technologies on the processes of economic development were considered by Magomedov et al. (2020). The researchers analysed how digital innovations can contribute to increasing labour productivity, optimising business processes, and creating new opportunities for entrepreneurship. The impact of digital technologies on the level of business competitiveness on the world stage was also assessed. The paper included examples of successfully implemented projects that show how digital technologies can stimulate economic growth and improve the quality of life of citizens. The issues of digital infrastructure, accessibility to information resources and cybersecurity as important aspects of the digital development of society were also considered. This study confirmed the conclusion that digital technologies are necessary to improve the quality of life and economic development of states by optimising business processes and creating new opportunities for entrepreneurship.

The relationship between digital technologies, innovation and skills development in the modern world was highlighted by Ciarli et al. (2021). The researchers investigated the impact of digital technologies on innovation in various spheres of the economy and society, which included consideration of the impact of digital tools such as artificial intelligence, the Internet of Things and blockchain on the processes of creating new products and services. In addition, the paper described the skills and competencies that are most in demand in the context of digital transformation, and how educational programmes and systems should adapt in order to train personnel capable of working effectively with digital technologies. The study raised issues of challenges and risks associated with digital innovation, including cybersecurity issues, ethical aspects of data use, and issues of accessibility of digital resources. The topic of digital innovation and skills development disclosed in this paper complemented the results of the study and demonstrated the importance of such digital tools as artificial intelligence, the Internet of Things, and blockchain in the process of socio-economic development of society.

Jiang (2020) considered the impact of the digital economy on the world economy and society in light of the global COVID-19 pandemic and post-pandemic challenges. The study highlighted the digital economy as a key tool for ensuring business continuity and providing services in conditions of restrictions and distancing during the pandemic by supporting remote work, online education, telemedicine and remote services. In addition, the paper analysed the transformation of industries and business models in the context of the digital economy and changes in consumer behaviour, which included consideration of trends in e-commerce, digital entertainment industry, and other areas. The author raised issues of challenges and opportunities related to the digital economy in the post-pandemic era, including issues of cybersecurity, digital inequality, and regulation of digital technologies. The study highlighted the importance of digitalisation of business processes to ensure the smooth operation of enterprises, which confirmed the importance of the digital economy in the modern world and emphasised its positive impact on business.

Based on the reviewed papers, it can be concluded that the digital economy is becoming a key engine of modern world development. Researchers emphasise that digital technologies and innovations contribute to productivity growth, sustainable business, increased access to financial services, and improved quality of life.

5. Conclusions

The study examined the impact of digitalisation on economic and social indicators in Kazakhstan. It was revealed that the digital transformation of urban farms contributes to productivity growth, improves the quality of life, stimulates business, and provides opportunities for creating innovative solutions. It also has a significant potential to increase the productivity and competitiveness of urban farms, due to increased

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availability of information, optimisation of processes and the creation of new opportunities for entrepreneurship. The study also aimed to assess the impact of digitalisation on the indicators of social well-being of citizens. In this context, it was revealed that digitalisation contributes to improving the quality of life of citizens, as technologies provide more efficient management of urban infrastructure, increase mobility and accessibility of educational and medical services. In addition, digital transformation promotes innovation and the development of the start-up ecosystem, which contributes to the creation of new jobs and economic growth.

Analysis of the dynamics of digitalisation of enterprises in the Republic of Kazakhstan and the city of Astana revealed the successful introduction of innovations at enterprises in Kazakhstan and Astana: the results of profitability and efficiency analyses confirmed significant progress in the field of digitalisation. It was shown that the average income of enterprises that actively implement innovations turned out to be significantly higher in comparison with those enterprises that do not attach due importance to digital transformation. The digital transformation of enterprises in Kazakhstan and Astana contributes to an increase in labour productivity and, as a result, to an increase in competitiveness both locally and globally. In addition, the study found a number of challenges and tasks that need to be addressed. Among them: ensuring cybersecurity, reducing digital inequality, and developing effective regulatory measures. To ensure continuous digitalisation, methods for solving these problems are provided in the paper.

For the sustainable development of the digital economy in Kazakhstan, special attention should be paid to education and support for small and medium-sized enterprises to ensure maximum inclusiveness and consider the interests of all segments of the population. In this regard, further research is recommended to focus on the development of an effective methodology for introducing innovations and expanding their functionality in small and medium-sized businesses. This will improve economic and social development in urban and rural areas: increase the profitability of enterprises, create new jobs, and attract investment.

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