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Innovative Approaches to Financial Sustainability and Ensuring Access to Justice for the Population Using Artificial Intelligence Tools

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ABSTRACT

The use of AI is relevant not only in terms of increasing productivity, but also in the context of sustainable development, reducing the negative impact on the environment and ensuring food security, since with the use of AI it is possible to develop forecasting models and optimize the use of resources, contributing to more sustainable and efficient management. The purpose of the study is to study the possibilities of using artificial intelligence tools to ensure the accessibility of the legislation of Kazakhstan, as well as their work to improve the efficiency, transparency and effectiveness in the provision of public and financial services. The use of AI to analyze and predict legal and financial decisions will increase the transparency and objectivity of proceedings, maximizing public confidence in the external system, aimed at studying how artificial intelligence technologies can affect the accessibility and quality of justice in Kazakhstan and the provision of public and financial services. The study is based on a methodological approach, including monographic, abstract-logical and analytical methods. The study used official statistical data provided by the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan, as well as information provided by the Statistics Committee of the Ministry of National Economy of the Republic of Kazakhstan. Results of the study. Based on the conducted study, conclusions are made about the prospects and directions for further development of the use of artificial intelligence in public administration business processes. The introduction of artificial intel-

ligence tools to ensure compliance with the law in Kazakhstan can improve the efficiency of public and financial service provision.

INTRODUCTION

Recent advances in *artificial intelligence* (AI) technology have significantly changed various areas of activity, from healthcare to financial services. One of the most promising areas of AI application is the legal system, where technology can play a key role in improving access to justice and increasing the efficiency of legal processes.

The introduction of AI tools into the legal system is an upcoming step towards modernizing and streamlining judicial and legal protection processes. AI allows for the automation of routine tasks, improved data processing and analysis, and faster and more online access to legal services. This is especially relevant for countries with wide territorial restrictions and differences in the provision of justice.

In the current context of digital transformation, justice in Kazakhstan is facing new challenges, interruptions in ensuring effective, accessible and fair legal proceedings for all segments of the population. Given the rapid growth of information volumes and the increase in the number of public cases, traditional methods of legal proceedings require progress. The introduction of AI tools into the legal system provides unique opportunities to improve the efficiency of courts, improve access to legal services, as well as to combat corruption and increase transparency. Digital transformation brings radical changes to the technological landscape, requiring organizations to review their working methods, including the introduction of new technologies, rethinking business processes.

Experience from various countries shows that gradual implementation of government ensures effective governance and is a key factor in creating effective, accountable and inclusive public institutions at all levels. The main principle of digitalization of public services, supported by a reliable institutional structure of civil servants, is to optimize the internal work of the public sector. This concerns the reduction of financial costs and time, allowing to integrate work processes and ensure the efficient use of resources in all types of activities of government agencies seeking to find sustainable solutions (Dreshpak et al., 2022).

Artificial intelligence can significantly improve the process of providing public services by automating routine tasks and processes, offering new opportunities to improve their quality, accessibility and efficiency, as well as to solve current problems.

1. LITERATURE REVIEW

Globalization, digitalization and development have a great impact on the work of government agencies. New requirements for the quality of public services are emerging. In foreign science, various issues of digital public administration in the interests of sustainable development are devoted to scientific works: S. Burlacu et al. (2021). Of significant interest was the study of the works of H. Seo and S. Myeong (2020), devoted to the topic of priority factors in building a government as a platform. The implementation of administrative reforms, and, in particular, the reform of the civil service, in the post-Soviet countries over the past 25 years was due not only to the need to implement state building in the former Soviet republics, but also to the influence of global trends associated with the crisis of the welfare state, tectonic social shifts in the modern world, where the emergence of supranational institutions and the development of civil society have necessitated a serious transformation of the traditional model of public administration (Bespalov, 2015). The formation of Kazakhstan's statehood is closely interconnected with a wide range of issues of theoretical and practical understanding of management (Dosymbekova, 2015). As a result of the information and communication revolution, most management tools have changed, and cognitive processes have also been activated (Voronkina, 2020). The development of AI as a technology that promotes economic growth and social empowerment has prompted researchers to systematically study current problems and report on the opportunities associated with them (Duan et al., 2019), Kopka, N. Grashof (2022). Current research in the field of AI focuses on shaping our daily lives, solving complex social problems, and

countering environmental challenges to protect the global ecosystem and sustainability (Baabdullah et al., 2022; Dubey et al., 2019; Dwivedie et al., 2022; Wamba et al., 2021).

The diversity and volume of the AI literature confirm the multidisciplinary and interdisciplinary nature of the research, which covers various aspects related to the quality of decision-making (Li et al., 2022). Based on the review of the material on ensuring access to justice for the population of Kazakhstan using artificial intelligence tools, it was revealed that globalization, digitalization and technological development are transforming the work of government agencies, placing new demands on the quality of public services. The relationship between expected results, expected efforts and attitudes towards the use of electronic government services was assessed in the works of I. Mensah et al. (2020). An analysis of foreign experience in the application of electronic government allowed us to form a general idea of the concept and trends in the desire for automation and digitalization in order to simplify management processes (Rodosakis et al., 2008), and to determine international positions in the application of digitalization in the public administration system in Kazakhstan. Research shows that more and more countries are moving towards the concept of a seamless and invisible government, where fully automated and personalized services are available to everyone at any time and in any place. This transition encourages governments to use advanced technologies such as cloud computing, artificial intelligence and blockchain to assess and meet the needs of voters. Administrative reforms, including the reform of civil services in the post-Soviet countries, were caused not only by the need to build new states, but also by general trends, interruptions with the crisis of welfare models and global details. The development of AI technologies, which contribute to the growth and expansion of social rights, has prompted active study of both current problems and opportunities related to scientific technologies. AI technologies open new horizons for solving social and environmental problems, improving the quality of life, and empowering citizens. Following this, scholars have begun to systematically consider and analyze ways to use AI to achieve development results, improve the efficiency of public administration, and protect global peace.

2. METHODOLOGY

Globalization, digitalization and the development of social networks have a major impact on the work of government agencies. New requirements for civil servants and the quality of public services are emerging (Figure 1).

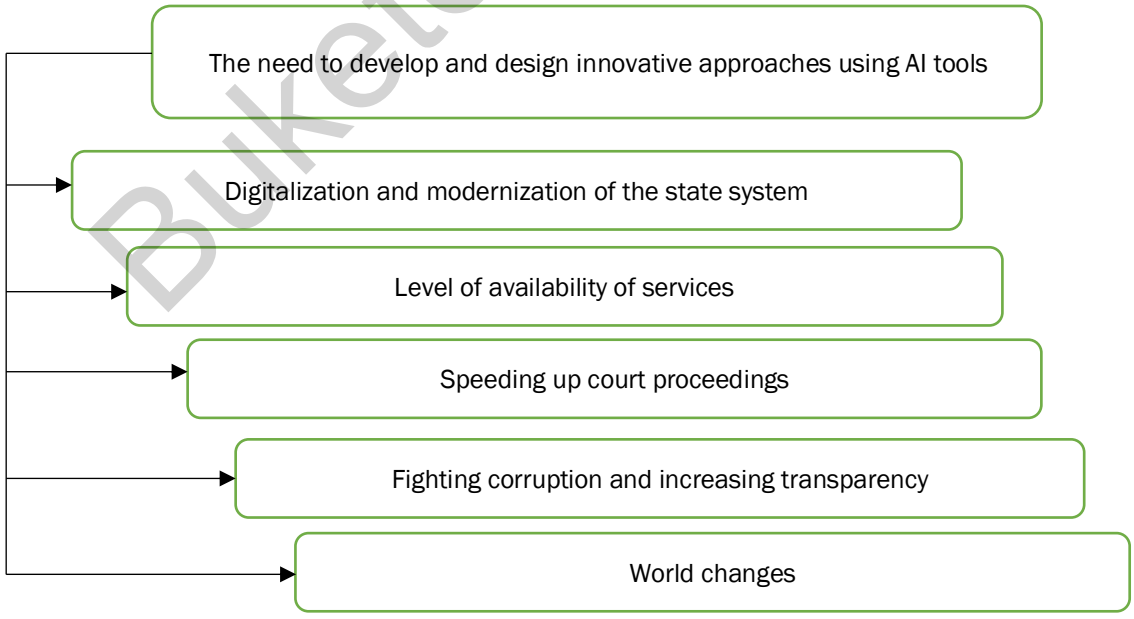

Figure 1. Need for Design and Development of Innovative Approaches Using AI Tools

Source: Compiled by the authors

According to Figure 1, the need to develop and design innovative approaches using AI tools includes:

A. Digitalization and modernization of the state system. Kazakhstan is actively developing digital infrastructure in various concepts, including justice. This is part of the state program Digital Kazakhstan, aimed at improving public services through the introduction of modern technologies. The use of AI in a complex system is a logical continuation of this program.

B. The level of service provision is an important indicator that determines the quality of life and ensures justice in society. In order for all citizens to have equal access to infrastructure services - external, educational, legal and specific - it is necessary to take into account many factors: physical proximity to buildings, economic accessibility, the use of modern technologies and the elimination. To increase the level of accessibility, an integrated approach is required, including improving employment, developing digital platforms, providing benefits and allowances, as well as adaptation services for vulnerable groups. A state that actively introduces innovations in these principles creates conditions for a more equitable distribution of resources, improving the quality of life and reducing economic inequality.

C. Using AI tools to speed up court proceedings in Kazakhstan can significantly improve the efficiency of the defense system, reduce the time it takes to consider cases, and reduce the workload of the courts. Automation of routine tasks, predicting case outcomes, online litigation, and improved case management are key mechanisms through which AI can speed up court proceedings. The implementation of these innovations creates a more productive and accessible legal system that will cope with modern challenges and needs.

D. AI plays a key role in increasing transparency and combating corruption in the modern system of Kazakhstan. By automating process processing, analyzing data, and ensuring transparency of the actions of all participants in court proceedings, AI helps to minimize the human factor, bias in crises, and combat illegal actions. These technologies help to create a fairer, more transparent, and honest system, strengthening citizens' trust in justice.

E. Global changes, covering various spheres of life and activity, cover social, social, environmental, and technological aspects. In recent changes, the world is undergoing large-scale transformations that affect society, the state and global systems as a whole.

Provision of public services in the Republic of Kazakhstan can be considered using the analysis of the money market as an AI tool in the context of availability of financing. The use of AI in public administration and the modern system of Kazakhstan is an innovative approach aimed at increasing the efficiency, transparency and availability of financing for the population. One of the symbols of the AI application can be the analysis of the money market to improve the provision of public services and the right of the court.

A. The role of financial transactions. The use of the balance of payments using AI makes it possible to study and process large amounts of data on financial transactions that can be useful for economic activity, identifying financial consequences, and simplifying the population's access to legal services:

- automation of payments;
- prevention of financial crimes;
- monitoring the execution of court decisions.

B. Integration of AI into the system of public services and justice. AI learns to integrate into various services and platforms to improve citizen interaction with a simple system and simplify the acquisition of rights:

- electronic government services and AI;
- judicial electronic systems;
- forecasting court decisions.

C. Increasing transparency and fighting corruption. The use of AI to analyze financial flows in the provision of public services and the main system in Kazakhstan plays a key role in increasing transparency and combating corruption, the essence of which is:

a) tracking financial flows:

- transaction monitoring;
- preventing illegal schemes;
- automation of services.

b) transparency of public services:

- public access to information;
- electronic payment systems;
- transparency of judicial proceedings.

D. Digitalization and accessibility of justice. Digitalization of modern systems and the use of AI to increase the availability of funding provide significant benefits. Electronic databases and open trials make justice more transparent and accessible. Automation and acceleration of routine operations allow for efficient process management and improved quality of service. Predictive algorithms provide more accurate and timely decision-making, increasing the level of trust in the virtual system and expanding access to justice:

a) open data and access to justice;
b) acceleration of trials:

- online consultations;
- legal chatbots;
- automation of document flow.

The use of the settlement market using analytical data is a promising tool for establishing access to public services in Kazakhstan. It helps automate processes, reduce corruption, increase transparency and speed up work processes. This introduction of AI into the sphere ensures the creation of a fairer, more transparent and accessible simple system, which is important for increasing citizens' trust in justice and the operation of rights. The well-being of the state is ensured not by the money it gives to officials every year, but by what it leaves in the pockets of citizens every year. Guided by the principles and goals of Sustainable Development Goal (SDG) 16 to increase transparency and accountability of public institutions, governments are actively using digital platforms to organize the process of public procurement, employment and payment settlements. Today, the demand for contactless payment methods is unprecedented. The demand for fast transaction settlements is equally high. Consumers and companies have switched from cash to a growing array of electronic payments. Payments have become more accessible thanks to innovations such as digital wallets, QR codes and mobile money.

3. ANALYSIS AND RESULTS

As technology advances, the market continues to change. Some leaders are already beginning to experiment with GenAI. For example:

- Visa and Mastercard use it to enhance the company's fraud detection capabilities;
- Bank of America uses an AI-powered virtual assistant to check balances, make payments, and get financial advice;
- Stripe deploys AI to streamline payment processing and increase transaction speed.

These examples illustrate how GenAI is revolutionizing the payments industry, causing even greater market growth in the future. Using market data to assess changing payment method trends in Kazakhstan, we will examine the volumes of different payment channels, revealing user preferences by payment method and providing valuable comparative analysis for payment instrument users (Figure 2).

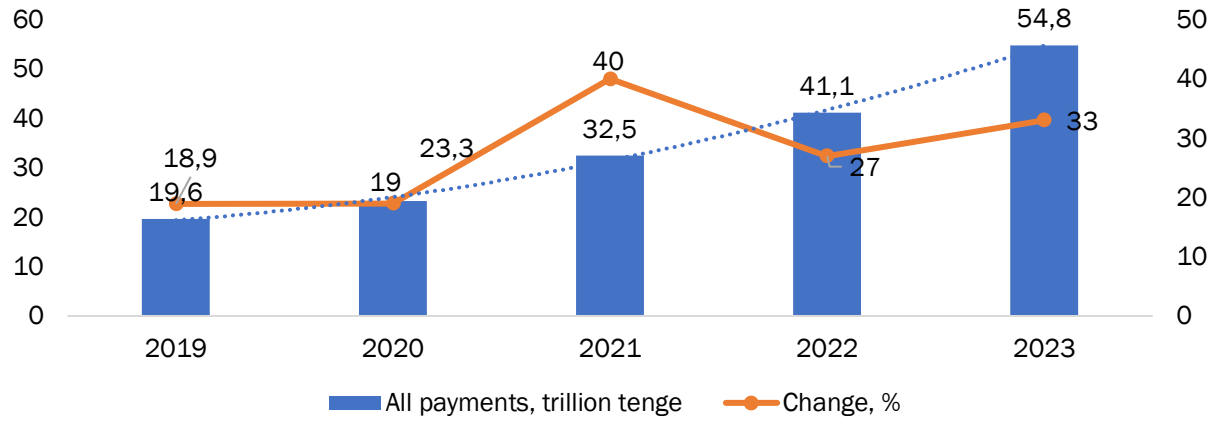

Figure 2. Payments market of the Republic of Kazakhstan for 2019-2023, trillion tenge

Source: compiled by the authors according to https://www.pwc.com/kz/en/publications/publication_assets/strategy-payments-july-2024-rus.pdf

Over the past five years, from 2019 to 2023, despite various local and global events affecting the country's economy, the payments market in Kazakhstan has grown by 2.8 times. The upward trend in volumes was seen in both cash and non-cash payments. Despite the growth of both types of payments, the growth rate of non-cash payments remains much higher - this trend indicates a smooth transition of the market to non-cash and digital payment methods. The shift towards non-cash and digital payment methods that began after the pandemic is likely to continue amid the increasing level of digitalization in Kazakhstan, the development of e-commerce platforms and changing consumer behavior. This trend points to a move towards a more digital and efficient payments ecosystem in line with global trends in the financial sector (Figure 3, 4).

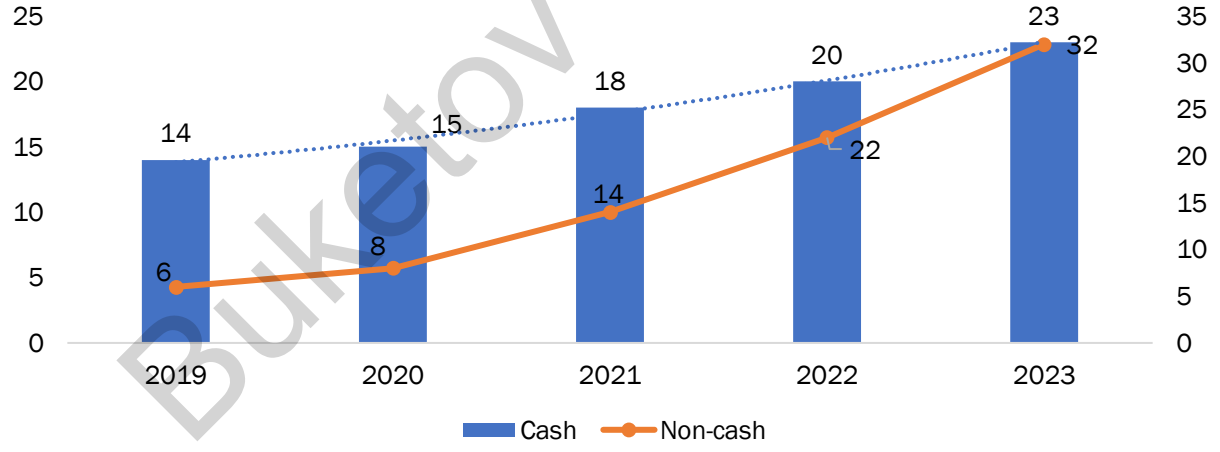

Figure 3. Total amount of cash and non-cash payments, trillion tenge

Source: compiled by the authors according to https://www.pwc.com/kz/en/publications/publication_assets/strategy-payments-july-2024-rus.pdf

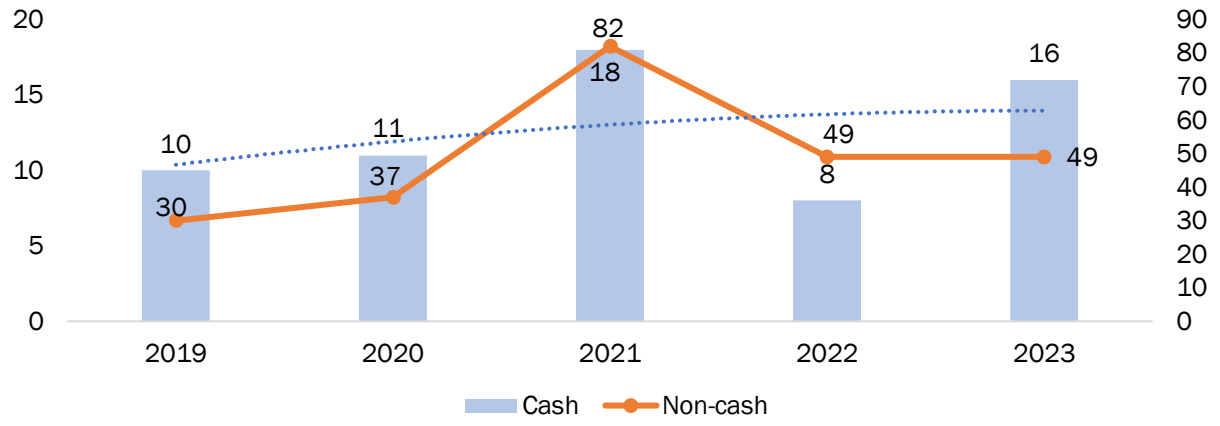

Figure 4. Annual changes, in %

Source: compiled by the authors according to https://www.pwc.com/kz/en/publications/publication_assets/strategy-payments-july-2024-rus.pdf

An analysis of the dynamics of changes in the amount of payments and the number of transactions shows that the number of cash withdrawals from ATMs continued to decline, reaching 240 million in 2023, which is 8% less than in the previous year. This led to an increase in the average cash withdrawal amount by 26%, from 75.2 thousand tenge to 94.7 thousand tenge (in 2022, the growth was 13%). The dynamics of changes in the amount and number of non-cash payments show a similar increase in 2023: the number of non-cash transactions increased by 43%, and the amount of non-cash payments increased by 49% compared to 2022. This led to a slight increase in the average receipt for non-cash payments by 4%, from 5.7 thousand tenge to 5.9 thousand tenge in 2022 and 2023, respectively (Figure 5).

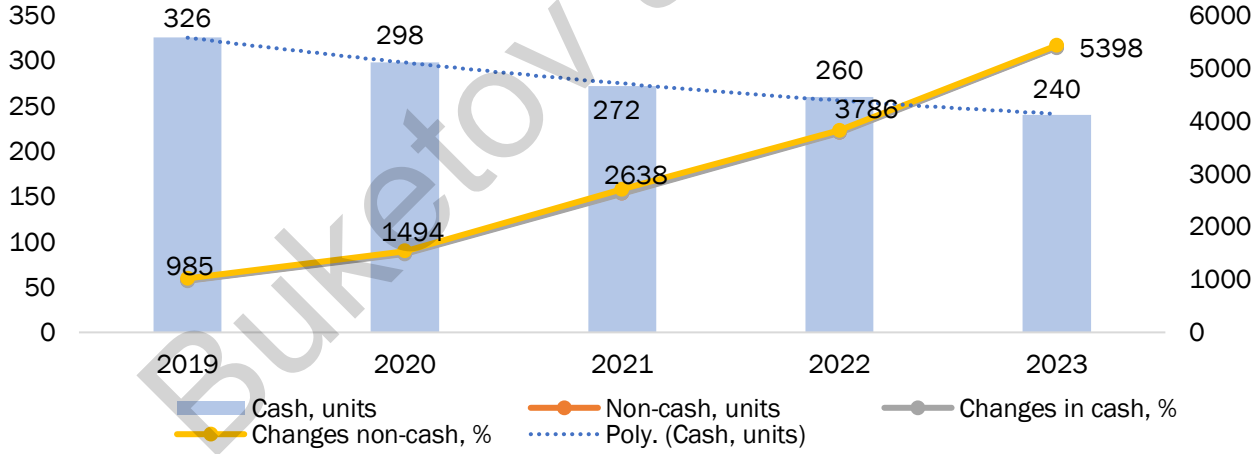

Figure 5. Total number of cash and non-cash transactions (units) and annual changes (%)

Source: compiled by the authors according to https://www.pwc.com/kz/en/publications/publication_assets/strategy-payments-july-2024-rus.pdf

The trend towards a decrease in the share of cash payments continued. From 2019 to 2023, the share of cash decreased by 29 percentage points, reaching 41% or 22.7 trillion tenge. Despite the decrease in the share of cash payments, they still remain an important part of the economy for a number of reasons:

- uneven development of non-cash technologies across economic sectors;
- tax evasion;

– population preferences;
– the need for cash in case of emergencies, etc.

In July 2023, the State Revenue Committee of the Ministry of Finance of the Republic of Kazakhstan imposed a restriction on mobile transfers, which led to a significant increase in the volume of cash payments by 16% in the second quarter, indicating that people and businesses that previously used mobile transfers to conduct transactions switched to cash payments in response to the imposed restrictions. The relationship between the behavioral change of people and businesses, the shift from mobile transfers to cash, and financial inclusion using AI in Kazakhstan can be explained by the following ASPs.

A. Restrictions on mobile transfers. Services impose restrictions on the use of mobile payments, such as limits on the amount of transfers or additional taxes on bank transactions, leading to a decrease in the popularity of electronic transfers and forcing people and businesses to return to using cash.

B. Financial inclusion through AI tools. To address financial inclusion issues, especially in the context of natural disasters or in remote regions of Kazakhstan where access to banks and availability of services is limited, AI can be applied to provide financial services more efficiently, even in conditions of limited infrastructure.

C. Response to technological and regulatory changes.

D. Social and economic impacts

Shifting some transactions back to cash due to restrictions is not always a long-term strategy. With the introduction of AI, we can expect the emergence of new financial products adapted to the needs of different groups of the population.

People and businesses that have switched to cash payments due to the restrictions imposed can be considered in terms of ensuring financial inclusion. However, AI plays a key role in ensuring financial inclusion. AI tools can help to adapt financial services to users, improve access to credit, optimize payment systems and support the increased use of electronic transfers instead of cash.

In the context of digital government, it is extremely important that innovations are aimed at development, and human potential/capital (HC) is no exception. For example, analyzing the experience of foreign countries, we can highlight the trend of providing information and services, including financial ones, through mobile applications, SMS and/or mobile browsers (Figure 6).

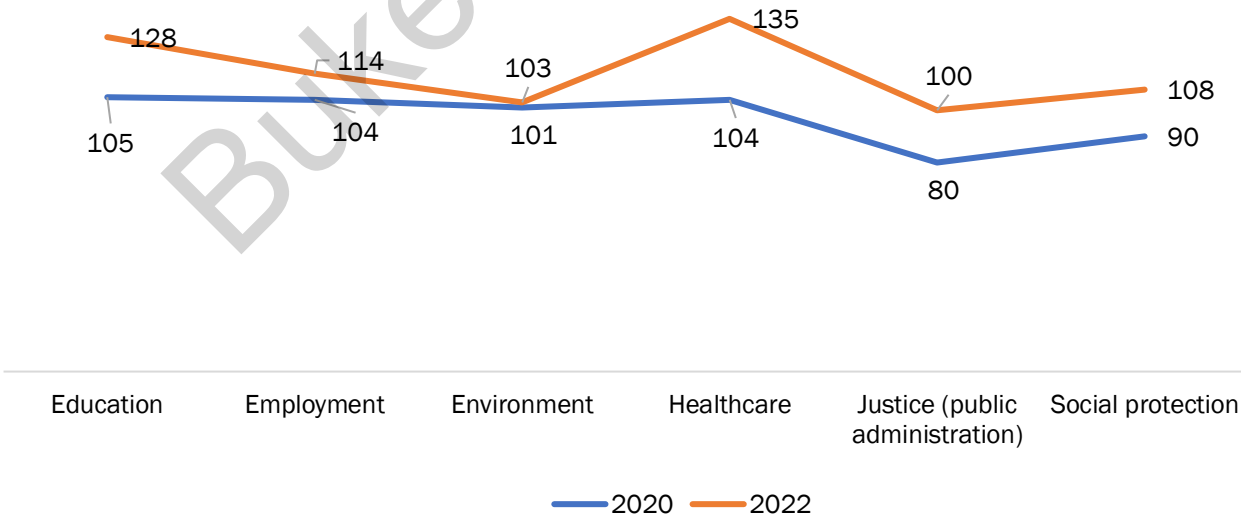

Figure 6. Sectoral data on the use of SMS and mobile applications for updating public information and providing services, 2020 and 2022

Source: Compiled by the authors according to https://desapublications.un.org/

The number of countries providing information and services via mobile apps, SMS and/or mobile browsers increased by an average of 18% between 2020 and 2022, largely due to the widespread adoption of digital solutions.

Among the key components of a favorable e-government ecosystem, the legislative framework regulating digital transformation, as well as legal mechanisms ensuring access to government information and compliance with privacy protocols are important.

Digital development is currently accelerating not only in developed but also in developing countries. Governments are increasingly using innovative web applications and new business models to improve the delivery of public services and enhance their quality for citizens. However, despite the progress in this direction, the implementation of digital technologies is still associated with difficulties and uncertainty, so it is especially important to pay attention to digital transformation.

Digitalization of government services will allow users to access a wide range of online transactions, but at the moment, in most countries, only partially digital services requiring personal presence are available. The digital divide remains a pressing issue despite the progress in this area, so it is necessary to continue working on improving the public administration and governance system to improve the quality of public services. Kazakhstan has the highest EGDI (Electronic Government Development Index) value among LLDCs (landlocked developing countries), and the government plans to expand and accelerate the digital transformation process under the Digital Kazakhstan program (Figure 7).

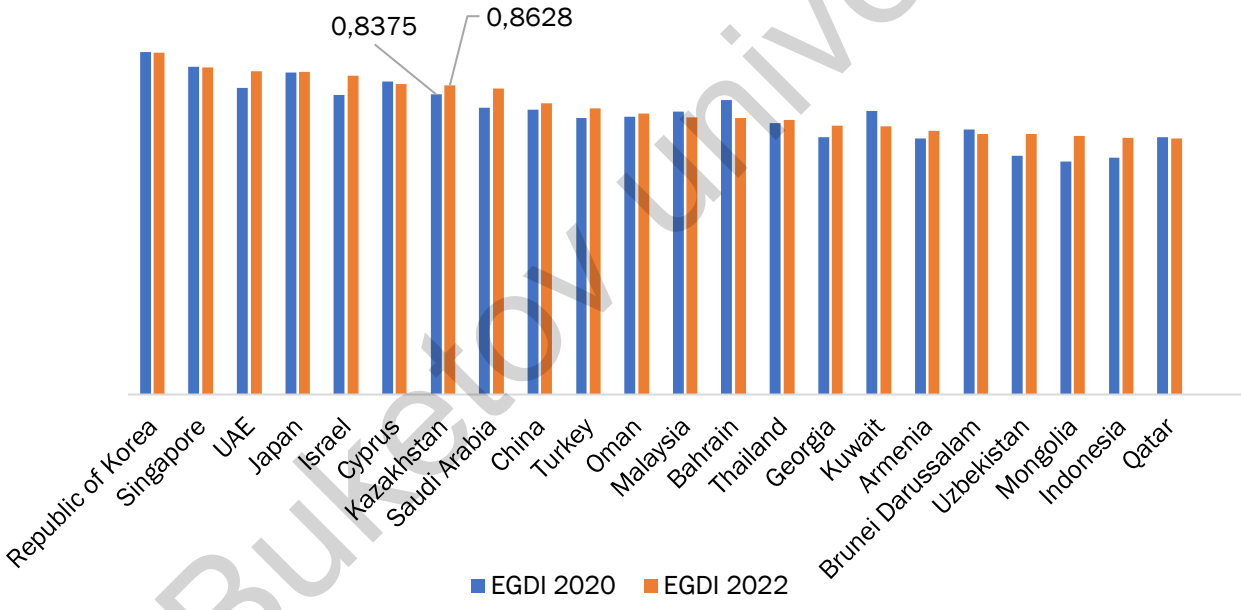

Figure 7. Asian countries with the highest EGDI values

Source: compiled by the authors according to https://desapublications.un.org/

If we consider the Electronic Government Development Index EGDI with other foreign countries and the CIS countries, we note that Asian countries have the highest values, and Kazakhstan is, according to the rating, in 28th place (Figure 8).

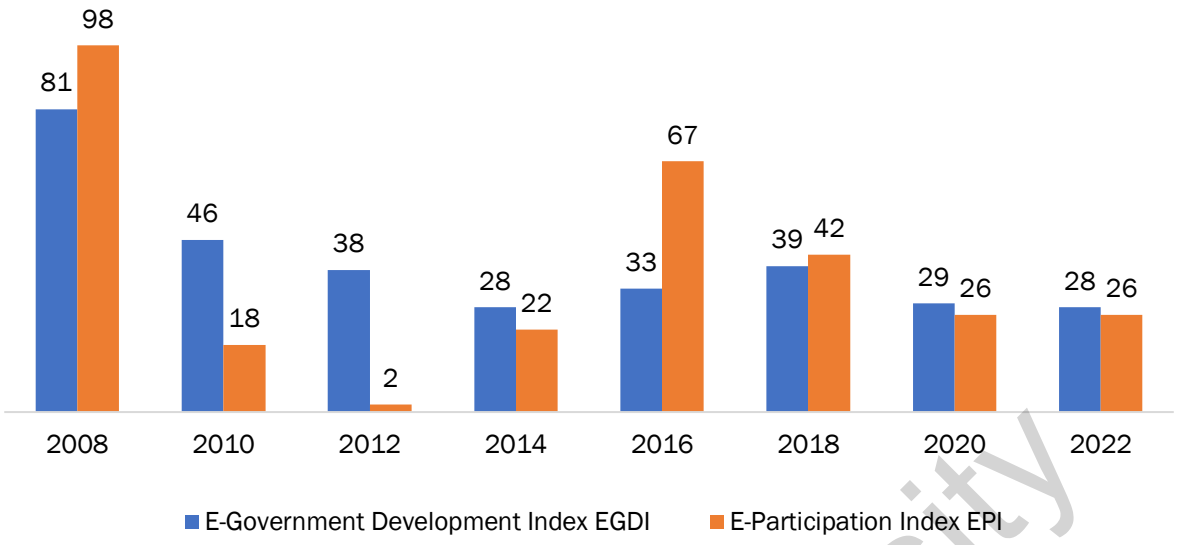

Figure 8. Achievements of the electronic government of the Republic of Kazakhstan for the period from 2008-2022.

Source: compiled by the authors according to https://egov.kz/

The practical application of digital technologies for the provision of public services in different countries of the world has led to the formation of different models of electronic signatures, each of which has its own differences and formation (Figure 9).

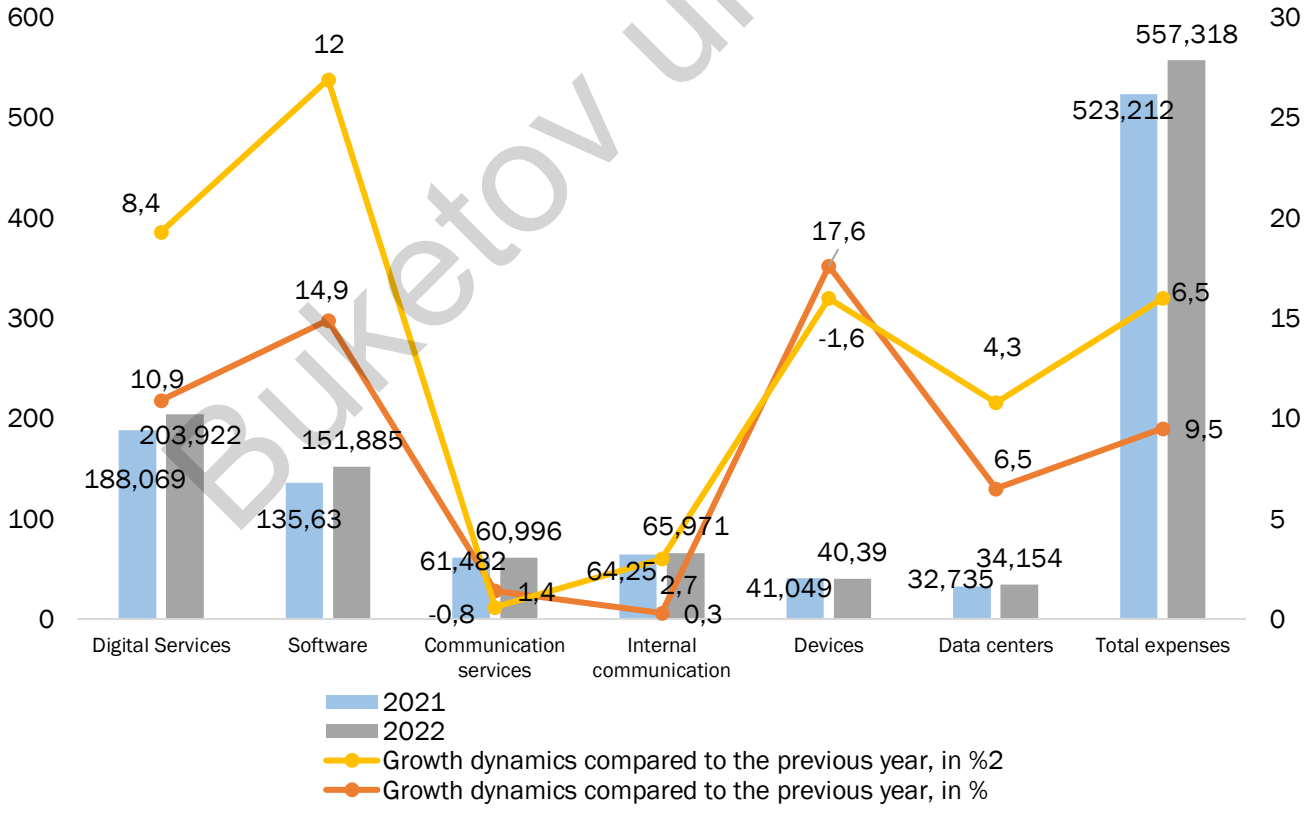

Figure 9. Total government spending on IT infrastructure by sector, 2021-2022 (in millions of US dollars)

Source: compiled by the authors according to https://publicadministration.un.org/en/

The e-government of the Republic of Kazakhstan has gone through four stages of development, achieving success and recognition in international and national rankings and competitions. In light of the increasing dependence on digital technologies, digital transformations in the public administration system have become more relevant and have helped improve EGDI indicators. The development of digital government and providing civil servants with the necessary tools to make informed decisions has increased its ability to function. The use of AI in the context of digital transformations of the public sector of Kazakhstan and the protection system opens up new opportunities for improving access to justice. Innovative approaches help make the legal system more accessible and transparent for all citizens, regardless of their location or permanent status.

4. EXPERIMENTAL RESULTS

Digital transformation in the state of Kazakhstan and innovative approaches to ensuring financial inclusion using AI tools are necessary areas of development aimed at improving public services and ensuring citizens' access to the judicial system. Based on global experience, it is clear that the use of AI in the public sector allows for the automation of routine tasks, improved data analytics, increased transparency and efficiency of government bodies, facilitating more accurate forecasting and planning, which is especially important for effectively solving complex socio-economic problems. Thanks to the introduction of AI, government agencies ensure faster and higher-quality provision of public services, improving interaction with citizens and businesses, as well as increasing the security and safety of information (Figure 10).

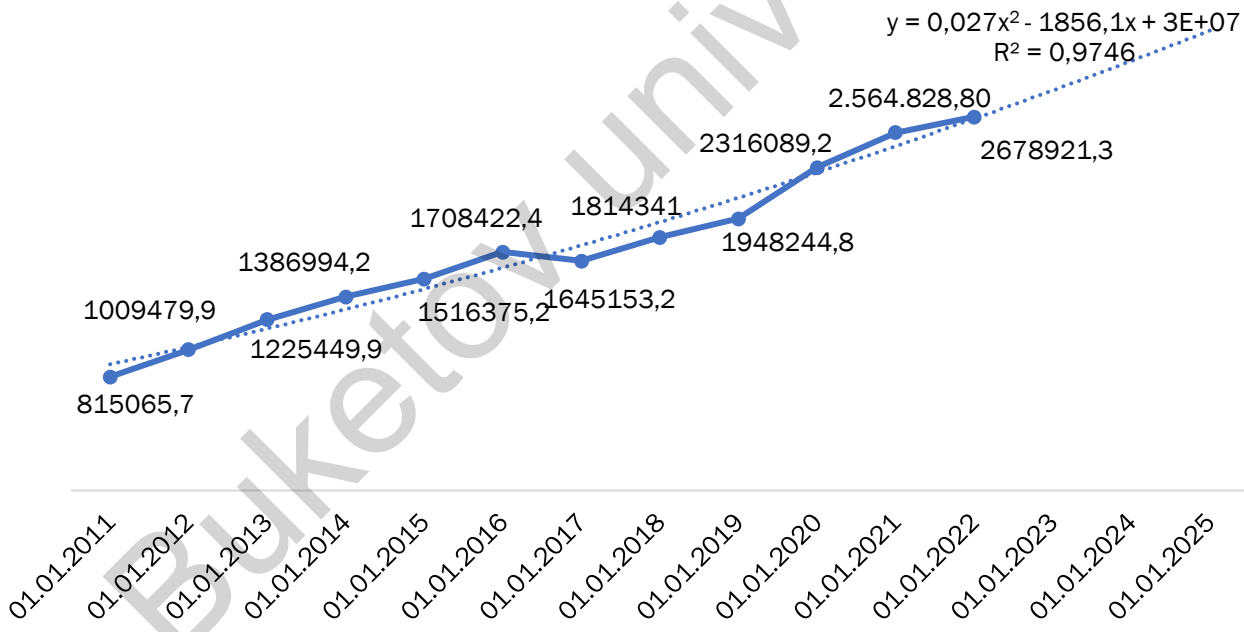

Figure 10. Public administration services, million tenge

Source*:* compiled by the authors

According to Figure 10, the demand for statistical data is changing and, at the same time, new opportunities are emerging due to the development of digital communications and the emergence of large data sets suitable for statistical processing and analysis in the public administration system (Figure 11).

Regression statistics	
Multiple R	0,99627
R-square	0,992554
Normal R-square	0,991313
Standard error	53648,33
Observations	8

Analysis of variance

	df	*SS*	*MS*	*F*	*Value F*
Regression	1	2,3E+12	2,3E+12	799,7912	1,29E-07
Remainder	6	1,73E+10	2,88E+09		
Total	7	2,32E+12			

	Coeffi-cients	*Standard error*	*t-Statistic*	*P-Value*	*Min 95%*	*Max 95%*	*Min 95,0%*	*Max 95,0%*
Y-inter-section	-4,7E+08	16734224	-28,1366	1,33E-07	-5,1E+08	-4,3E+08	-5,1E+08	-4,3E+08
Variable X 1	234109,9	8278,117	28,28058	1,29E-07	213854,1	254365,8	213854,1	254365,8

Figure 11. Output of the final forecast

Source*:* compiled by the authors

As a result of the calculations, a forecast was made for the development of digitalization in the public administration system (Figure 12).

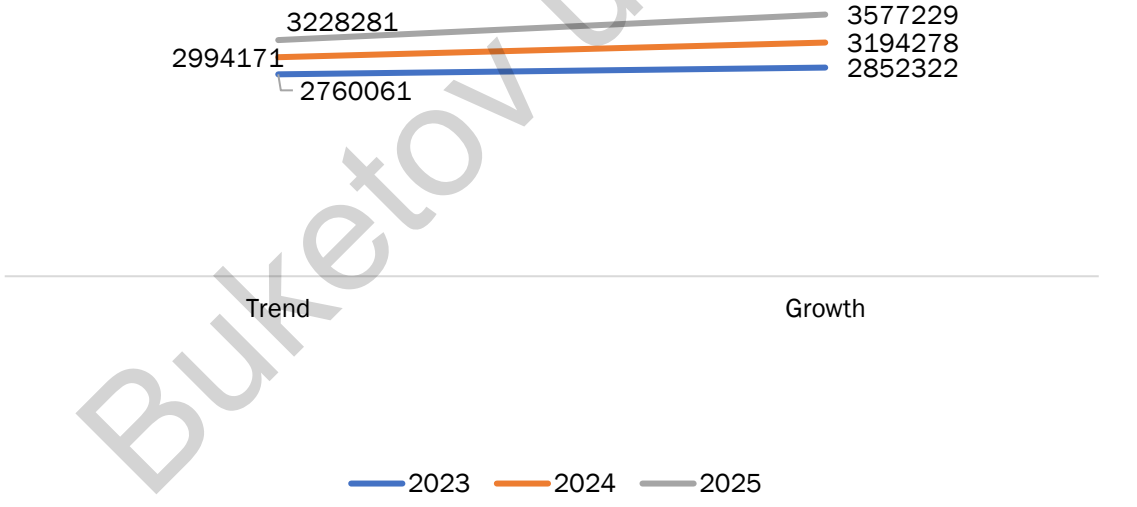

Figure 12. Forecast of development of services in the public administration system in the context of digitalization

Source*:* compiled by the authors

As a result of the calculations, a forecast was made for the development of services in the public administration system in the context of digitalization, which indicates an increase in the provision of services

Thus, digital transformation in the public sector not only improves the efficiency of processes, but also helps to strengthen the provision of public services and involve the population in governance processes.

The process of introducing digital technologies for the provision of public services has covered all countries of the world, leading to the creation of various models of EP.

The development of modern technologies stimulates government bodies to use AI in various aspects of their activities. The forecast for the development of services in the public administration system in the context of digitalization shows a significant increase in their provision. This is due to improved availability and speed of services, increased efficiency of civil servants, increased transparency and accountability, reduced costs and improved interaction between government agencies. All these factors contribute to increased citizen satisfaction and improved overall efficiency of the public administration system.

CONCLUSION

By implementing AI, government agencies provide faster and better public services, improving interaction with citizens and businesses, and increasing the security and safety of information. However, successful implementation of AI in government agencies requires taking into account various aspects, including technical, organizational, legal and ethical issues, as well as providing training and support to personnel to effectively use new technologies.

Innovative approaches to justice delivery in Kazakhstan using AI tools open up new opportunities for a progressive justice system and improved quality of justice. The use of AI can improve access to justice for all citizens, especially those living in remote and hard-to-reach places.

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