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## IMPROVING THE QUALITY OF STATE SERVICES DUE TO THE USE OF AI TECHNOLOGIES: INTERNATIONAL EXPERIENCE AND PERSPECTIVE OF KAZAKHSTAN

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**Abstract:** Artificial intelligence plays a decisive role in developing technologies and opening new horizons in various spheres of life, from medicine to education. It makes everyday tasks simpler and contributes to innovations, changing our view of the possibilities of the future. Artificial intelligence has a large potential to improve the effectiveness of human activities in different directions. It can change the most important aspects of human life and contribute to the operation of businesses, governments, and organisations. AI technologies are actively used in different spheres of public life worldwide. AI technologies are used in medical diagnoses, control of unmanned vehicles, financial tools trading at the stock exchange, analysis of big data, generation and recognition of images, creation of robots, etc. Fundamental AI technologies are to support the transformation of the economy, labour market, state institutions, and society on the whole. The use of AI technologies will ensure significant opportunities for raising the effectiveness of production, reducing costs, and improving the quality of goods and services. An increase in the volumes of data, the development of new types of sensors, and the cheapening of calculation capacities create preconditions for further development of AI technologies. Implementation of AI and global communication infrastructure also change the traditional views of labour relations, leading to the emergence of new professions.

Public administration is based on the collection and analysis of large volumes of data. Demand for AI in public administration grows, and the application of AI in this sphere has great potential. The main problems of implementing AI into the practice of public administration are connected with the general issues of the influence of digital technologies on the development of all public spheres. AI can also significantly improve the quality of state services at the national and municipal levels. In this paper, we considered the application of AI in public administration and the provision of state services and its contribution to the improvement of the quality of state services around the world and, in particular, in Kazakhstan.

**Keywords:** state services, AI technologies, Kazakhstan, public administration, governance, E-government.

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## **1. Introduction**

Quick development and dissemination of digital technologies have been changing the face of the key spheres of public life in recent decades. The adoption of artificial intelligence by the organisations of the public sectors allows them to improve various aspects of governance. Integration of AI technologies into public services provides benefits and public value to citizens (van Noordt & Misuraca, 2022).

Governments of many countries see AI as a strategic resource to improve competitiveness and increase economic growth. AI can be used to provide a personalized service delivery experience, improve the efficiency of processes, increase policy compliance, and contribute to the detection of fraud.

Benefits of AI for governments include quicker citizen services, higher efficiency, and better decision-making. The government adopt AI to improve the quality of state services and raise productivity (Mellouli et al., 2024).

The notion of artificial intelligence appeared in the 1950s, but AI technologies gained popularity only recently due to an increase in the volumes of data, improvement of algorithms, and optimisation of computational capacities and means for data storage. The issue of using AI in public administration has become very relevant, especially in the modern digital age. Implementation of the leading information technologies is an important task for every country. Most countries of the world have already adopted a range of measures aimed at stimulating the development of digital technologies, including artificial intelligence.

AI can change the means of the government's work and help public officials to work more effectively. AI is also integrated into many technological (cloud) platforms and is used by search engines and services of information search. AI technologies can accelerate managerial

decision-making and automatize typical everyday tasks. Implementation of AI into the everyday life of public officials will allow public authorities to accelerate decision-making due to simpler processing, assessment, analysis, and forecasting.

Governments can use AI to form better policies and make better decisions, enhance communication with citizens, and raise the speed and quality of public services. Artificial intelligence provides great possibilities to increase the productivity and quality of public services and government operations (Berryhill et al., 2019).

However, the application of AI in government creates challenges. It can increase trust towards governments, but it can also reduce citizens' trust in decisions of public authorities, which can be caused by breaches in privacy or a lack of fairness in using AI in public governance.

Present-day society needs improved access to quality public services. Other needs include satisfaction of different public demands and improvement of the quality of life and quality of state services at all levels.

The goal of this paper was to consider the use of AI in public administration and, in particular, state services, to improve their quality. We elaborated on the application of AI in public governance on the whole and dwelt on the perspective of Kazakhstan in using AI in public administration and e-government.

## **2. Methodological basis of the research**

The methodological basis of assessment and improvement of the quality of state services from the position of using AI has a complex character which covers different spheres of scientific cognition, from the innovations theory to innovations management. Based on the system approach, expansion of the conceptual provisions of the research is achieved due to public management, which determines conditions for controlled

development of society in the conditions of democracy. Thus, the key scientific spheres which provisions are used in the work belong to the institutional theory, the theory of public governance, comparative institutional analysis, and innovations theory. A separate group of theories and concepts, from the position of the objective component, concerns social sciences as a sector that considers the behaviour of social groups in the conditions of modification and improvement of the existence of their existence.

The information basis of the research is characterised by significant diversification and reservations. The key reservations are peculiar for a high level of dynamics of the studied processes and innovations. According to this, the complexity of support of relevant knowledge does not allow offering stable unchanged models but requires constant efforts for monitoring of the situation and upgrade of information and managerial procedures. Diversification of the information basis is connected with the absence of a unified methodology of accounting and analysis of the quality of provision of administrative services. Given this, information used in the work is a structured, to a certain extent, volume of data which requires additional processing and expansion.

The methodology used in this work has a general scientific character and is based on empirical cognition of scientific processes and problems. It includes the methods of analysis and synthesis, which allow assessing processes in the sphere of improvement of state services from the position of different components; method of observation, which allows forming data samples; method of comparison, which is the basis for identifying the best practices and positive and negative changes, and generalisation, which allows summing up information about the real state of affairs, problems and potential for solving them.

Theoretical substantiation of the possibilities

for improvement of the quality of state services through the use of AI has a rather strong basis and includes the works of leading scholars and practitioners. The main theoretical provisions used in this work stem from assessment of AI as a driver of quality changes in the sphere of public governance and administration (Jabłoński and Firszt, 2023), take into account the transformation potential of AI from the position of improvement of information systems of management (Alrumi, 2023), consider theoretical aspects of implementing AI into the public sphere (Buntak et al., 2020), expand understanding of the influence of AI on marketing communications (Alfouzan et al., 2024), digital inclusiveness of governance (Popkova, 2024), and spatial and institutional context of Kazakhstan (Otarbayeva et al., 2024).

The goal of this research was to generalise and systematise factors and processes that influence the quality of provision of state services in the world and Kazakhstan, in particular, assess the potential of their improvement due to the use of digital technologies, and identify Kazakhstan's successfulness in this context given its location and development.

### **3. Experimental setting and methods**

The market of artificial intelligence reached \$184 billion in 2024 and is expected to reach \$826 billion in 2030 (Thormundsson, 2024). According to other estimates, it is to reach \$1,047 billion by 2031.

According to Bigot (2024), the top 10 countries for AI are the USA (the top five AI companies: Google DeepMind, OpenAI, Microsoft, IBM Watson, and Amazon Web Services), China (the top five AI companies: Baidu, Tencent, Huawei, Alibaba DAMO Academy, and SenseTime), France (the top five AI companies: Hugging Face, Mistral AI, Braincube, HarfangLab, and Prevision.io), the UK (the top five AI

companies: DeepMind, Darktrace, Graphcore, Babylon Health, and Revolut), Canada (the top five AI companies: Element AI, Coveo, Layer 6 AI, Integrate.ai, and BlueDot), Germany (the top five AI companies: Siemens, SAP, Bosch, DeepL, and Volocopter), Israel, Japan, India, and Singapore.

The process of transformation of the system of public administration started with the improvement of the means of interaction between public authorities and society. The main goal was to make the communication process easier and accessible for everyone. Optimisation of internal and external functions of the public governance system and an increase in effectiveness and transparency of public administration led to the implementation of e-governance. The use of AI in public governance could provide economic benefits, which include a reduction of costs due to the replacement of the workforce and an increase in the service economy. This, in turn, will contribute to the quality of services.

Artificial intelligence can cope with complex tasks and facilitate human activities. In the context of public governance and services, the implementation of AI in public services can increase service efficiency and service quality for citizens.

Benefits of AI in the public sector include growth of productivity, digital assistance, improvement of creativity by creating new content, faster decisions, better extraction of information from different sources, resolution of complex problems, automation of tasks, etc. Risks of AI in the public sector include unemployment, energy consumption due to larger computing capacities, loss of human expertise and knowledge, increase in human errors, unfair decisions and policies, lack of trust in decisions and policies, and others (Mellouli et al., 2024).

However, despite the above, the advantages of artificial intelligence are obvious. AI can provide effective solutions in case of a lack of skilled specialists, contribute to the

minimisation of human factors in important spheres of activities, and raise labour efficiency.

Promising spheres of applying AI technologies in the system of public administration include processing of citizens' appeals, control over law enforcement, assessment of risks, optimization of corporate operational processes, financial control over budget expenditures, personalized services based on analysis of citizen's digital profile, and effective distribution of resources and support in decision-making.

Singapore has a national programme in the sphere of AI (AI Singapore), which is aimed at the stimulation, integration, and expansion of the capabilities of AI to ensure the future of the digital economy (AI Singapore, 2024). AI Singapore unifies all research institutes in the country, as well as the dynamic ecosystem of start-ups in the sphere of AI and companies that deal with AI products to develop knowledge, technologies, and professional skills. Singapore uses AI in the transport sector, e.g., to regulate the transmission capacity of city roads during rush hours, and in healthcare, e.g., to prevent, diagnose, and plan treatment, manage the turnover of medicine, and develop new medicines.

The advantages of using AI by the public sector are as follows: better forecasting and provision of information (more effective realization of the activities of public authorities); positive social effect due to resolution of most acute social problems; modelling complex systems for experiments with different political decisions and detection of unpredictable consequences as a result of implementing different measures; improvement of the process of provision of state services and their quality; automatization of simple routine tasks.

The emergence and development of information and communication technologies led to a change in the sphere of public governance and the emergence of new

concepts and notions, in particular e-government and e-governance. They are used for the processes of public administration and the formation of civil society. At present, e-government and e-governance are global phenomena, for governments use these concepts to promote citizens' participation in public life and expand their rights and opportunities. E-government and e-governance involve automatization and digitalization of traditional paper procedures, which leads to new styles of management, new strategic decisions, and new means of organisation and provision of information. E-government covers not only the network infrastructure of executive authorities but the entire infrastructure of public authorities.

The e-governance concept is wider compared to e-government, for it leads to a change in citizens' attitudes towards government. The goal of e-governance is to provide new rights and authority to citizens.

The e-governance concept is based on five

components: government to citizen (G2C), consumer to government (C2G), government to government (G2G), government to business, and government to nongovernmental organization (G2N).

Governments around the world strive towards using AI for their economic and public activities. Many countries have announced their strategies in the sphere of AI. National AI strategies are political tools that adopt priorities for state investment and political interferences and determine the main directions for legislation. They ensure the basis for the coordination of political actions to achieve a common vision. Many countries implement their AI strategies in ministries and government bodies, focusing on various opportunities and tasks.

Kazakhstan has significant achievements and perspectives in the implementation of AI in many spheres of activities, including the provision of state services. Kazakhstan is ranked 72nd in the Government AI Readiness Index (Table 1).

**Table 1.** Government AI Readiness Index 2023, Global Rankings

	Country	Total Score
1	United States of America	84.80
2	Singapore	81.97
3	United Kingdom of Great Britain and Northern Ireland	78.57
4	Finland	77.37
5	Canada	77.07
6	France	76.07
7	Republic of Korea	75.65
8	Germany	75.26
9	Japan	75.08
10	Netherlands	74.47
11	Denmark	73.91
12	Australia	73.89
13	Norway	72.71
14	Sweden	72.55
15	Austria	72.37
16	China	70.94
17	Estonia	70.86
18	United Arab Emirates	70.42
19	Taiwan	70.25
20	Ireland	69.82
72	Kazakhstan	48.56

Source: Government AI Readiness Index 2023 (2023)

Kazakhstan is ranked 3rd in the South and Central Asian region, after India and Turkiye. In Astana, the Astana Hub, an international technology park with special tax and visa status, has concluded a partnership with Google for Startups on its Silkway Accelerator programme. This partnership involves the provision of support and mentoring for tech startups in the region (Government AI Readiness Index, 2023)

Also, Kazakhstan is ranked 48th globally for artificial intelligence readiness, according to the International Monetary Fund's (IMF) 2023 AI Preparedness Index (IMF, 2023).

On 27 April 2024, the Government of the Republic of Kazakhstan adopted a decree on the creation of a new body – the Committee for Artificial Intelligence and Development of Innovations under the Ministry of Digital Development, Innovations and Aerospace Industry. The new body will deal with the national policy in the development of AI, legal regulation, and coordination of the adjacent issues.

It should be noted that AI can ensure a more open process of decision-making, ensure access to information about the activities of public officers, and improve accountability mechanisms. AI systems can analyse large volumes of data to detect corruption or ineffective use of budget funds. Also, AI can help in the analysis of draft laws and decrees, providing citizens with simplified access to documents and the possibility of active participation in public discussion (Safinov, 2024).

Kazakhstan's advantages in the development of AI include accessibility of data, digital potential, and adaptability of the legal framework to digital business models. A lot has been achieved within the national initiative on the development of AI. For example, the Government Cloud Computing Infrastructure is to be commissioned. It is a regional centre for cloud computing – the infrastructure on which AI services will be able to work. Kazakhstan transfers an increasing number of state services into the digital form, which includes their integration

into the environment of bank mobile applications.

A range of strategic documents – the National Plan for the Development of the Republic of Kazakhstan by 2025 and the Concept for Digital Transformation, Development of the ICT and Cyber Security Sector for 2023 — 2029 – adopted tasks and measures in the context of AI. Kazakhstan has also prepared a Concept for Artificial Intelligence Development for 2024 — 2029, according to which the application of AI algorithms in state administration will improve the quality and speed of the provision of state services. The use of intellectual assistants on the websites of public authorities and e-government will allow citizens to quickly find the necessary information and receive state services. AI can also contribute to the improvement of proactive state services (Artificial Intelligence, 2024).

According to the Concept for Artificial Intelligence Development for 2024-2029, AI will become an important tool to raise the effectiveness of anti-corruption efforts and the quality of public administration. This will allow ensuring the transparency of public authorities' decisions, analysing large volumes of information, and forecasting and modelling potential corruption risks (The Concept for Artificial Intelligence Development for 2024-2025, 2024).

Kazakhstan's Concept for Artificial Intelligence Development for 2024-2029 is aimed at the expansion of AI usage in various sectors of the country's economy. According to the Concept, the application of AI will be expanded primarily in public administration, oil & gas and mining industries, energy spheres, transport, logistics, and agriculture.

According to Kazakhstan's Ministry of Digital Development, Innovations and Aerospace Industry the following goals are to be reached by 2029: teaching AI skills to five million people; training 500,000 industry specialists; and increasing IT

exports by up to \$ 5 billion. The Concept of Development of Artificial Intelligence for 2024-2025 is aimed at the formation of an ecosystem of AI, the formation of a favourable climate, and further development of economic sectors with the use of AI. This involved a supercomputer project, the creation of data processing centres, the creation of the National platform of AI, and the development of the system of fibre-optic lines of communications (Tribune.kz, 2024).

In early 2024, Bagdat Musin, the then minister for digital development, innovations and the aerospace industry, announced eGov.AI – AI with Kazakhstan's e-government.

Egov.kz is Kazakhstan's e-government portal. It allows citizens and civil services to interact quickly and conveniently, with the help of leading technologies. Among the multitude of services and options provided by E-gov.kz, citizens can check taxes and fines, receive certificates and statements, obtain licenses, and register a company. One of the main tasks of e-government is ensuring the joint functioning of government bodies, which allows citizens to receive the required documents in one place, without visiting multiple locations. The idea of the creation of e-government in Kazakhstan was announced during the annual address of the President of the Republic of Kazakhstan on 19 March 2004. 12 April 2006 saw the start of the portal of Kazakhstan's e-government – eGov.kz. As of now, 93.3% of all state services are provided in electronic form, and 86 % of state services can be obtained via smartphones.

In June 2024, the meeting of the Government of the Republic of Kazakhstan discussed, among other issues, the implementation of AI elements in state services for citizens and businesses. Government bodies presented results of integrating new AI services: educational assistants, service for monitoring of natural disasters, electronic lines on Kazakhstan's borders, and automatization of business

processes in Baiterek holding (Official Information Resource of the Prime Minister of the Republic of Kazakhstan, 2024)

One of the most ambitious AI-related programmes in Kazakhstan involves the creation of a supercomputer and data processing centre (DPC) in partnership with the UAE's company Presight. This project was announced in February 2024. Its commissioning will benefit IT, financial services, manufacturing, healthcare, energy, and education sectors (BBC, 2024). Presight is a partner in this project, with ongoing negotiations held with Microsoft, Google, Amazon and other technological companies.

#### **4. Discussion**

New AI technologies appeared during a new wave of technological development. They stimulate the transformation of the economy, the labour market, government institutions, and society on the whole. The use of AI technologies can also contribute to the reduction of costs, growth of production efficiency, and the quality of goods and services. A new type of industrial production takes place – the one based on Big Data and its analysis, full automatization of production, technologies of virtual and alternate reality, etc.

Innovative technologies of AI, which are aimed at improving the quality of life, provide diverse opportunities for the creation, implementation, and monitoring of the conditions of development. As the world practice shows, there emerge socioeconomic, political, and technological risks of realization of public interests and observance of citizens' rights. The development of AI also influences the structure of employment. In the future, certain professions will be partially or fully automatized, which will lead to an increase in demand for specialists who can develop and study AI technologies and specialists who can apply AI and the corresponding technologies in different spheres.

Since AI technologies penetrate the lives of

each person and society on the whole, the implementation of AI technologies in public governance has become very relevant. AI technologies could be used to solve typical tasks of public officers or simplify the execution of routine operations.

In the sphere of public governance, AI can provide help in different directions: analysis, and systematisation of archive data, adoption of transparent procedures of financing, taxation, etc. The task of the government is to search for an effective model of legal regulation of the AI sphere, which will ensure the protection of rights and liberties of the participants of relations in the sphere of AI to develop and use AI technologies with compliance with ethical standards.

Despite the quick development of AI technologies, there are certain problems with its application. These include the issue of data that will be allowed for processing by AI since control over information is important for any country or company. There is the issue of state control over the use of AI by the private sector. It is also necessary to control AI decisions because humans must control AI's actions. There is the issue of responsibility for AI decisions, for mistakes might lead to catastrophic consequences. Control of confidentiality is also important because personal data protection is very relevant in the modern world. Most countries realise the importance of AI for socioeconomic development. At present, the leading countries in the sphere of AI are the USA and China, for they invest the most in the development of AI and create the best conditions for the activities of technological companies. These countries are also leaders in the number of registered patents in the sphere of AI.

AI is actively used in many countries to raise the quality of state services. However, data collection and analysis with the help of AI systems by governments might lead to citizens' concerns regarding relationships between the citizens and the government. Citizens often avoid interaction with

technical assistants and have a certain mistrust to the formalised system of data analysis. Problems with personal data protection and increasing control over citizens' actions also lead to mistrust in public authorities.

## **5. Conclusions**

In recent years, information technologies have been actively influencing all aspects of modern life, and public governance is no exception. Digitalization led to substantial transformations in public governance. However, digital transformation in the state sector causes a range of problems – unsanctioned access to confidential information, the use of personal data, blocking of public authorities' functioning, cyber crimes, etc. – which have to be solved to ensure the successful development of digital transformation in public governance.

AI systems are built on data. Thus, the quality and accessibility of data, as well as the ability of state authorities to effectively work with them, are critical. State institutions manage large volumes of data, which are stored in state registers, databases, and archives. This information is partially provided in the form of open data, which makes it accessible for repeated use by citizens and businesses, including for the creation of products and services with the use of AI. However, certain data is not available for use due to its unsatisfactory quality and absence of its digital form.

The use of AI technologies in state management and their proper legal regulation can potentially reduce the number of routine operations performed by public officials, minimise costs, and increase the speed and quality of management decision-making. The application of AI technologies in the sphere of public administration has a large potential in raising the effectiveness and quality of state services. AI could be used for automatization of administrative processes, analysis of large databases, forecasting the demand for services,



detection of fraud, and forecasting and management of risks. Implementation of AI technologies can also reduce corruption risks in different spheres and improve the process of checking anti-corruption declarations.

At present, many countries compete for the development and use of AI to raise their competitiveness in the world. Strategies developed by the countries are to facilitate the development of AI, while better strategies will help the countries to be ready for future technological changes.

AI technologies could be very important factors in the change of behaviour in many spheres of human activities. They are aimed at simplification of the process of decision-making and optimisation of the management activities on the whole.

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