Legal Issues of Government Bodies Digital Transformation

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Abstract

[Purpose] In the context of the rapid spread of digital technologies, the legal mechanisms that regulate the activities of government bodies in Kazakhstan lag behind practical needs. This gap gives rise to legal risks and institutional fragmentation. The purpose of the study is to identify regulatory gaps in the digital transformation of government bodies in Kazakhstan and develop proposals for their elimination.

[Methodology/approach/design] The main method used is normative-dogmatic analysis, supplemented by a systems approach and legal modelling. The authors note that existing norms are adopted reactively and do not provide sufficient certainty for the subjects of electronic interaction.

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[Findings] The author analyses the main achievements of digitalization. Particular attention is paid to data protection issues and the lack of a unified law on cybersecurity, which, according to the authors, hinders citizens' trust in online services.
[Practical implications] The relevance of the study is enhanced by the importance of digital transformation for post-socialist countries that need to overcome the legacy of centralized governance. Additional significance is given to the problem by Kazakhstan's high rating in global e-government indices, which contrasts with the remaining legislative gaps.
[Originality/value] The authors substantiate the need to adopt a codified act that should unify terminology and eliminate gaps. It is proposed to expand the scope of the Law of the Republic of Kazakhstan of 6 April 2016 No. 480-V "On legal acts" by including digitalization and cybersecurity in the list of coded areas.

Keywords: Public Administration. Digitalization. E-government. Personal Data Protection. Cybersecurity. Digital Code.

INTRODUCTION

Current advantages and challenges of the 21st century associated with the rapid development of technologies. Modern states are faced with the need to process large amounts of data and ensure a high level of cybersecurity. At the same time, citizens of the state also expect an increase in the quality and availability of public services. Digital transformation has a global impact on the development of humanity (DULAMBAEVA, 2021). This requires states not just a technological update, but a profound transformation of the models of exercising state power.

This issue is relevant for post-socialist countries, such as Kazakhstan, as it inherited centralized, unaccountable management from the Soviet model. It was focused on bureaucratic procedures, and not on the needs of citizens. In the context of a market economy and globalization, such a model is becoming ineffective. Moreover, many post-socialist countries initially had a low digital base. Although, with proper management, this can serve as an advantage, as it helps to introduce advanced technologies, bypassing outdated systems.

In addition, the relevance of the topic is due to the current situation in the global economy. Today, the use of digital technologies is the main condition for the development of a competitive economy. This global trend has largely affected government agencies. All this emphasizes the importance of studying the issues of digital transformation of government bodies in Kazakhstan. According to the UN, Kazakhstan is currently ranked 29th out of 193 countries in the E-Government Development Index, 26th in the E-Participation Index, 39th out of 139 countries in the Network Readiness Index, and 52nd in the

Information and Communications Technology Development Index (KAZIEVA et al., 2022).

It is important to note that the digital transformation of government bodies should not be understood as a one-time modernization. Transformation involves a fundamental rethinking of the functions of the state and mechanisms for implementing public policy. Such a process should be carried out based on modern technological approaches. It covers changes in institutional structures in matters of the logic of interaction with the population. Digital transformation involves a transition from traditional bureaucratic mechanisms to platform models. They are usually based on working with Big Data and automation. In such models, data becomes a key resource. The decision-making itself is based on operational analytics, which ensures more flexible and targeted regulation. As a result, public administration is formed that is focused on efficiency and real satisfaction of the needs of society.

At the same time, understanding digital transformation solely through a technological prism seems insufficient. Sustainable development of transformations requires a holistic legal system capable of adapting to the challenges of the digital age. Its task is to ensure a balance between innovation and the protection of citizens' rights. Digital transformation occupies a strategic place in the state policy of the Republic of Kazakhstan. The Strategic Development Plan of the Republic of Kazakhstan until 2025 (PRESIDENT OF THE REPUBLIC OF KAZAKHSTAN, 2018) indicates the increasing role of digital technologies in public administration. The basis is the opinion of experts who claim that the size of the digital economy is from 4.5 to 15.5% of global GDP (KAZIEVA et al., 2022).

Current and past digital initiatives have ensured the implementation of key components of e-government. These steps have allowed the country to take a stable position in international digital development rankings and have demonstrated a course towards integration into the global information environment. However, in practice, challenges remain: uneven access to digital services, infrastructural inequality, the sustainability of bureaucratic procedures, and limited digital competencies among civil servants. Of particular importance is the need to ensure cybersecurity and protect information sovereignty, which requires reliable and relevant regulatory frameworks. Thus, there is a need to understand the understanding of digital transformation and the specifics of its legal regulation in Kazakhstan. This will identify existing difficulties and help propose specific legal and practical steps to eliminate them.

METHODOLOGY

The methodological basis of the study included a number of approaches that provided a comprehensive understanding of the legal nature of digital transformation. The main methodological tool of the study was the normative-dogmatic method. It was used to analyse the current legislation of the Republic of Kazakhstan regulating digital transformation, including laws on informatisation, electronic documents, access to information, personal data protection, and cybersecurity. This method allowed to interpret legal provisions through the prism of their formal content, hierarchical position, and internal consistency. In practice, the normative-dogmatic approach was implemented by studying how legal norms define the scope of powers of public authorities, establish legal regimes for digital tools, and regulate electronic interaction between the state and citizens. Its application helped identify gaps in regulation, overlaps in legislation, and situations where digital practices operate without clear legal justification. The results obtained using this method formed the basis for the conclusion that Kazakhstan's digital legislation developed on the principle of layering policies, which ensured rapid progress but led to fragmentation and legal uncertainty

The systemic method was used to analyse digital transformation as an integrated phenomenon that combines legal, institutional, technological, and social elements. This approach allowed the study to go beyond the analysis of individual legal acts and assess how different components of digital governance interact. In particular, the systems method was used to examine the relationship between regulation, institutional architecture, and the actual implementation of digital public services. It also structured the identified problems into regulatory, institutional, procedural, and ethical categories, which subsequently formed the basis for their classification and comparative assessment.

The comparative legal method was used to analyse foreign experience of digital transformation of public administration on the example of Estonia and Georgia. This method was implemented by comparing the legal frameworks, institutional models, and regulatory instruments used in these countries with those used in Kazakhstan. The comparative analysis permitted to identify functional similarities and differences, and determine which elements of foreign models could be adapted to the Kazakh context without mechanical transfer. The results obtained using this method substantiated the feasibility of certain approaches, such as unified digital identification systems, interagency data exchange mechanisms, and multi-channel service delivery models.

The legal modelling method was used to develop proposals for improving the regulation of digital transformation. This approach was implemented by

constructing regulatory hypotheses based on the shortcomings identified through regulatory, dogmatic, and systemic analysis. In particular, legal modelling was used to assess the feasibility of introducing a codified Digital Code and a single law on cybersecurity. The method allowed to predict the potential legal and institutional consequences of such codification, including its impact on legal certainty, administrative practice and protection of citizens' rights. The study resulted in specific proposals, such as expanding the scope of the Law on Normative Legal Acts to include digitalisation and cybersecurity among the codified areas, and establishing experimental regulatory regimes to test digital solutions before they were fully legislated.

Doctrinal content analysis was used to study scientific and expert literature. The author of the work placed special emphasis on the sources of the last five years, given the novelty of the topic of digitalization. In addition, national legal acts and recommendations of international organizations were studied. Empirical data were also partially studied to understand the status of digitalization in Kazakhstan. This multi-level methodological framework provides not only a comprehensive study of the legal foundations of digital transformation, but also the development of well-founded recommendations for the formation of an adaptive, proactive and human-oriented model of digital governance in Kazakhstan.

The combination of these methods provided a comprehensive and logically consistent analysis of the legal framework for digital transformation in Kazakhstan. The applied methodology helped diagnose existing regulatory problems and develop sound recommendations aimed at forming an adaptive, coherent, and human-centred model of digital governance.

LITERATURE REVIEW

Issues of digital transformation are actively studied by Kazakh and foreign scientists. Lozić and Fotova Čiković (2024) conducted a comprehensive study of general approaches to the digital transformation concept. The study covers the period of the last five years and contains a systematization of more than 40 scientific publications, which permits to trace not only the multi-vector nature of the approaches, but also the dominant accents in the interpretation of this concept in academic discourse. The authors distinguish three key groups of approaches: technologically oriented: strategic-organizational and social-value.

Importantly, Lozić and Fotova Čiković (2024) not only classify approaches but also reveal internal contradictions between them. They also emphasize that only a comprehensive interpretation of digital transformation allows for an adequate assessment of its impact in the field of public administration. The classification of these researchers was used to derive

authors' approach to defining the concept under study, however, in the context of government bodies rather than the general phenomenon. In addition, the novel approaches to classifying existing administrations were adopted and supplemented the work of Lozić and Fotova Čiković (2024). Thus, this article provides an important theoretical reference point in the analysis and helped place further research within the contemporary scientific field.

Kazieva et al. (2022) presents a comprehensive economic and managerial study in which digitalization is viewed not as a technical project. The authors analyse Kazakhstan's positions in international e-government indices and compare the indicators with EU practices. Based on this, the authors highlight the institutional risks of digital transformation. Methodologically, the work is based on the collection of official statistical data. The article focus on the need to create adequate regulatory support. In addition, the study demonstrates which technological areas are already being implemented and, therefore, need a clear legal status. The authors draw attention to the fragmentation of the current legislation.

Kostyanaya and Sarsenova (2024) focus on the risks of digital inequality and cybersecurity issues. Verhoef et al. (2021) consider the economic aspects of digitalization and sees it as a global trend. At the same time, Sartaeva (2024) speaks about the need to adapt trends to the cultural and political context of Kazakhstan. Idrysheva (2022) analyses institutional changes within the framework of the Digital Kazakhstan program. Galy and Bazhaeva (2024) raise issues of regulating digital services and rights in the digital environment. Karzhaubaev (2024) and Abuova (2025) pay attention to the legal nature of digital solutions and the need to adapt legislation. Isabaeva (2024) and Nusipzhanov et al. (2025) analyse the effectiveness of regulatory support for the digital transformation. Despite the breadth of coverage and diversity of research perspectives, the need for a holistic legal concept covering all key aspects of the digital transformation of public administration remains obvious.

RESULTS

Theoretical and legal approaches to defining the concept of digital transformation

In the scientific literature, the concept of digital transformation is considered in different ways. For example, Lozic and Fotova Čiković (2024) define digital transformation as a process aimed at improving an organization by initiating significant changes in its properties through the use of combinations of modern information, computing, communication and network technologies. These researchers conducted an in-depth analysis of the definition of the concept

of "digital transformation". In turn, the new classification of approaches to the definition is suggested. Vial (2019) emphasizes that digitalization is not limited to the implementation of individual IT solutions, but leads to profound changes in the structure, processes and culture of an organization. Transformation should really affect the basic "properties" and processes of government agencies, and not just introduce new programs.

Technological advances often make it easier to combine existing products and services to create new digital offerings. As Xu and Yongyuan (2018) point out, although change brings new opportunities, it also creates uncertainty. Digital transformation refers to the need to immediately adapt activities to adopt new technologies. Skog (2019) defines this as the need for a holistic adaptation to modern challenges to ensure value creation. According to Du and Jiang (2022), there are three main determinants that lead companies towards the digital transformation process, namely changes in the macro environment, a high level of competitive intensity (KOHLI & MELVILLE, 2019) and changing customer requirements (VERHOEF et al., 2021). In other words, digitalization is perceived as a response to the challenges of the time. Indeed, government agencies are initiating digital reforms to improve the quality and speed of service delivery. Therefore, the opinions expressed by researchers can clearly characterize the digital transformation process.

It is need to be pointed out that there are opinions among researchers that suggest considering digital transformation as a response to innovation flows. Thus, a group of researchers note that digital transformation is fuelled by a significant flow of digital innovations that can cause a significant shift in the value of an organization (BARTHEL & HESS, 2020; DEMLEHNER & LAUMER, 2020; WESSEL et al., 2021). This definition emphasizes the constant emergence of new technologies. Scientific and technological progress leads to a revision of the traditional functions and value propositions of government bodies. Innovations do act as a catalyst for change in public administration. However, it is not just the availability of technologies that is important, but also the willingness of institutions to use them.

The fourth group of definitions emphasizes the target effects of transformation. For example, Singh et al. (2020) believe that digital transformation is a process of increasing productivity, creating value and public welfare through the introduction of breakthrough technologies. Abiodun et al. (2022) note that this process represents an increase in productivity, value creation and social well-being through the implementation of breakthrough technologies. Indeed, by implementing digital solutions, public administration bodies restructure internal processes in order to obtain tangible results. These may be resource savings, improved services or increased convenience for

citizens. The ultimate goal of digitalization of government agencies is a tangible improvement in the life of society.

It is also worth noting that there is a view in academic circles on digital transformation as a complex and comprehensive change. Digital transformation goes beyond the simple integration of technologies. It represents a comprehensive shift in approaches and administrative processes (AZIMBAYEVA, 2024). Digital transformation affects not only the services of organizations, but also their organizational processes, systems and operations (BOHNSACK et al., 2018; STROHMEIER, 2020). Researchers who adhere to this approach to defining digital transformation cover both the technological and organizational side. At the same time, they also point out significant effects on the economy and society. In relation to public administration, it means that digitalization should radically improve the processes of providing public services and the functioning of government bodies. At the same time, digital transformation should have a tangible positive effect on citizens and the state.

Based on the approaches considered, the new definition of digital transformation is offered which will be used in this article in relation to government agencies. Thus, digital transformation of government agencies is a complex process of deep transformation of their activities under the influence of modern digital technologies, accompanied by a revision of internal processes, structures and methods of work, in order to significantly increase the efficiency of management, which ultimately leads to significant socio-economic benefits for society. This view combines the technological, organizational and value aspects of transformation. In addition, the definition emphasizes that success requires not only new digital systems, but also institutional changes.

Similarly, digitalization of public governance refers to the process of transitioning from a traditional model of administrative management to a digitally modernized system in which electronic legal relations, algorithmic procedures, and citizens' access to services are regulated by public law. Therefore, digital transformation in public administration requires not only technological innovation, but also the formation of an appropriate regulatory environment. It is designed to ensure the legal legitimacy and controllability of new digital forms of state activity.

Legal basis for digital transformation of public administration

The legal foundation for Kazakhstan’s digital transformation of public administration developed in stages, each strengthening the regulatory framework for digital initiatives. It began with recognizing the legal validity of electronic documents, then expanded to cover information security and related areas. This

gradual approach aimed to create a comprehensive legal system ensuring a smooth and legally certain transition to a digital state.

The legal recognition of digital tools in Kazakhstan began with the Law of 7 January 2003 No. 370 "On Electronic Document and Electronic Digital Signature," which established the legal force of electronic documents and signatures. This law laid the foundation for lawful electronic interaction between citizens and the state and set a long-term framework for integrating technology into public administration. Its adoption was partly motivated by the need to reduce transaction costs in a transition economy (WORLD BANK, 2017). The next step was establishing a regulatory framework for telecommunications. The Law of 5 July 2004 No. 567-II "On Communications" defined the legal basis for telecom services, operators' obligations, and guarantees of user access. By requiring non-discriminatory access to trunk lines, it ensured the infrastructure and competition necessary for digital services to become widespread (OECD, 2014).

The Strategic Development Plan of Kazakhstan until 2025 (PRESIDENT OF THE REPUBLIC OF KAZAKHSTAN, 2018) prioritized improving citizens' living conditions through high-quality public services, emphasizing that such services require digitalization. Following this strategy, key regulatory acts were adopted over the next decade, laying the foundation for the digital transformation of government agencies (Senate of the Parliament of the Republic of Kazakhstan, 2019). To support this digital environment, rules for personal data protection were established. The Law of 21 May 2013 No. 94-V "On Personal Data and Their Protection" set out legal mechanisms for processing, storing, and safeguarding personal information, defining data processors' obligations to ensure confidentiality. This law enabled the secure functioning of digital platforms such as eGov, e-health, and digital identification systems, marking a crucial step toward comprehensive digital public services.

The Decree of 8 January 2013 No. 464 "On the State Programme Information Kazakhstan – 2020" aimed to build an information society and advance e-government. A key focus was enhancing government transparency and accountability through technology. While the decree is no longer in force, the program created significant IT infrastructure and introduced the first electronic services for citizens and businesses. Its approach of "policy layering" allowed earlier regulations to be improved rather than replaced (Suominen, 2024).

A new stage in Kazakhstan's digital transformation was marked by two key laws: the Law of 24 November 2015 No. 418-V "On Informatization," which defined state policy and information security requirements, and the Law of 16 November 2015 No. 401-V "On Access to Information," which

established the legal basis for government transparency. These acts strengthened accountability in digital governance. To ensure consistent digital standards, the Government Resolution of 20 December 2016 No. 832 introduced mandatory uniform requirements for ICT and information security, guiding the design and operation of digital systems and establishing a Unified Register of IT Architecture.

In 2018, strategic management of digital reforms was strengthened by the Presidential Decree No. 621, which established the Commission for the Implementation of Digitalization to coordinate state bodies, monitor progress, and support digital transformation. Simultaneously, the State Program Digital Kazakhstan (Resolution No. 827, 2017) promoted digital infrastructure, online services, and digital literacy. Legislation was further updated in 2020 with the Law of 25 June 2020 No. 347-VI, introducing the concept of digital assets. This expanded legal regulation from electronic document management to broader aspects of the digital economy.

In 2024, the Ministry of Digital Development approved the Rules for Digital Transformation (Order No. 112/НҚ), detailing technical and procedural standards for implementing digital solutions in public administration and updating service delivery processes. Long-term guidelines are provided in the Concept of Digital Transformation, Development, and Cybersecurity 2023–2029 (Resolution No. 269, 2023), emphasizing sustainable IT infrastructure and alignment of cybersecurity with international standards.

Cybersecurity is a key focus of Kazakhstan's digital legal framework. The Cyber Shield of Kazakhstan concept (Resolution No. 407, 2017) established regulations for protecting critical information infrastructure and created the National Coordination Centre for Information Security to safeguard state systems. This approach reflects a model of digital sovereignty, where information security is treated as an element of national sovereignty (OECD, 2023).

The legal framework for Kazakhstan's digital transformation shows a logical, gradual evolution, covering key aspects such as electronic documents, telecom infrastructure, e-services, personal data protection, and informatization. Its growth followed a policy layering approach, where new laws supplemented rather than replaced existing ones. This enabled rapid progress but also led to fragmented concepts and overlapping agency mandates. While the framework supports the practical application of digitalization and allows for future improvements, it cannot yet be considered fully systematic. The following sections highlight existing challenges and propose solutions (Table 1).

Index	Year	Kazakhstan's ranking	Meaning
UN E-Government Development Index (EGDI)	2022	High EGDI group	High level of digital services in terms of formal indicators
Online Service Index (OSI)	2022	Above global average	Advantage of the service component over the regulatory one
ICT Development Index (ITU)	2021	Upper-middle tier	Technology outpaces the regulation
Global Cybersecurity Index	2020	Medium–High level	Existence of institutions without comprehensive codification

Table 1 – Position of Kazakhstan in selected international digital governance rankings

The presented rating indicators indicate a high level of digital maturity of Kazakhstan according to international assessments, while not reflecting the fragmentation of legal regulation identified in the regulatory and dogmatic analysis.

Analysis of foreign experience in digital transformation on the examples of Estonia and Georgia

Naturally, Kazakhstan is following its own way of digital transformation. However, it is worth noting that there are countries that have already taken similar steps and have their own developed digitalized system of public administration. In fact, there are quite a few examples of such states. In the context of the Kazakhstan issue, it is important to consider countries that share a common past with Kazakhstan, namely those that belonged to the socialist states and were part of the USSR. Therefore, Estonia and Georgia were chosen for analysis. These countries have a common past and a similar path of development after the collapse of the USSR. However, they are located in different regions. Estonia is a member of the EU and has actively adopted its experience. Georgia is not a member of the EU and has a different path of digital transformation. Studying the experience of these countries and the obstacles they face on the path to the digitalization of government agencies can serve as an important example for Kazakhstan. However, it is necessary to adapt foreign experience to the realities and challenges of Kazakhstan. However, studying countries that have already gone through a similar stage can prevent possible challenges in the future and identify best practices.

Therefore, considering the example of Estonia, after regaining independence in 1991, Estonia decided to radically modernize its management system. The key prerequisite was a combination of political will and favourable

external factors. The government understood the importance of digital technologies for economic development and improving the efficiency of public services (BULA, 2024). The high level of education of the population and the broad technical knowledge of citizens facilitated the acceptance of innovations. Significant support for digitalization was provided by the EU and international organizations (VASSIL, 2016).

In the early 2000s, basic laws for the development of digital infrastructure were adopted. The Public Information Act of the Republic of Estonia (2000) guaranteed citizens open access to data from state bodies. The Electronic Communications Act (Riigikogu, 2004) ensured the liberalization of the telecom market and promoted the development of national networks. Key institutions included the Centre for Information Systems Development, established at the government level, and the corresponding register of plans and projects of state agencies. The creation of appropriate systems made it possible to coordinate the digital transformation. One of the first projects was "Tiger Leap" (est. *Tiigrihüpe*, 1997–2001) is a state program for the computerization of schools, which ensured the computer literacy of the younger generation. On its basis, new technologies were gradually introduced between 1997 and 2007 (BULA, 2024).

In 2001, the interdepartmental data exchange system X-Road was launched, which allowed various state information systems to exchange information securely. In 2002–2003, Estonia became the first country in the world with a national electronic identification card (e-ID). The corresponding system is a database of digital signatures and access to online services. In 2005, the practice of Internet voting (i-Voting) began (Vassil, 2016). Thus, by the end of the first decade of the 21st century, the foundation for e-government had been laid, combining the appropriate regulatory framework and digital infrastructure.

However, the Estonian model faced various challenges on the path to digitalization. For example, in the initial phase, there was an acute "digital divide." As Kalkul and Kalvet (2002) note, by the mid-1990s, only about a third of the population used the Internet, and access to computers in homes was limited. The main barrier to social innovation was not technical, but educational factors. Thus, in the early 2000s, "the possibilities of the Internet were not associated with personal needs." This challenge was overcome thanks to strong cooperation between the state and the private sector. In 2001-2002, banks and telecom operators initiated the "Look@World project", which taught about 100,000 people the basics of ICT. Private banks also actively promoted a new electronic ID card, which significantly accelerated its spread.

Technical problems included security and communication issues in remote regions. The first test of strength was the Bronze Night cyberattack in

April 2007, when attackers targeted government servers. After the attack, the Estonian government consolidated its resources using cryptographic technologies (VASSIL, 2016). In general, the Estonian system has strict data protection standards. The state implemented the GDPR and created a number of national laws on cybersecurity. In addition, the introduction of technologies was not hampered by high levels of bureaucracy. Therefore, the latest approaches were implemented quickly.

Today, Estonia's e-government model is considered one of the most advanced in the world. Virtually all government services are available online around the clock. According to data from 2024, about 99% of government services are available online. The technical core of the system remains the X-Road platform, which represents a decentralized level of data exchange between more than 900 organizations. This exchange ensures the interaction of public registries and services. Each transaction uses an electronic ID card or Mobile-ID as a secure cryptographic means of authentication. Centralized registries provide reliable, real-time information and eliminate the need for unnecessary paper documents. Estonia is also actively investing in cybersecurity. For example, the state has a developed warning and response system, and data is stored in a distributed manner (E-ESTONIA, 2024).

The valuable lessons learned from Estonia's transformation can be adapted in Kazakhstan. Kazakhstan itself has already taken steps toward digital identification. For example, the eGov mobile application has been launched. In this context, Kazakhstan can borrow Estonia's experience in creating a legal basis for a unified electronic ID card with a digital signature (BORAK, 2024). It would be useful to create an interdepartmental data exchange channel similar to X-Road. The managerial aspect is also important: the creation of a centralized body to coordinate e-government programs. Such a comprehensive approach can significantly accelerate Kazakhstan's digital transformation and provide sustainable benefits for society.

As for Georgia, after 2003, the country launched large-scale reforms of public administration. According to an OECD study (2022), Georgia has significantly improved its institutional framework and expanded the provision of e-services. According to UN estimates, Georgia is among the leaders in the region in terms of e-governance, although its EGDI index (0.78 in 2024) is slightly lower than that of Kazakhstan (28th place) (WORLD BANK GROUP, 2022a). The government focused primarily on transparency and efficiency, which were to be achieved through the use of IT systems. Georgia has embarked on reforms focusing on anti-corruption and simplification of administrative procedures (CAVANAUGH, 2024). A preliminary version of the law on e-documents was adopted back in 2006. However, progress in e-governance has

been fragmented (remote filing of declarations, attempts at e-justice, etc. (TCHRIKISHVILI, 2024).

In 2011-2012, the Public Service Hall concept was launched and implemented. It consisted of a network of administrative service centres. Since 2012, citizens have been able to obtain all basic services at these centres: passport/ID issuance; business registration; notary services; driver's license issuance; car registration; tax payment (GOGIDZE, 2015). This model is recognized as one of the most successful in Georgia (according to the UN). At the same time, the my.gov.ge portal was launched with over 700 e-services (TSKHADADZE, 2024).

However, the most significant changes took place after the signing of the Association Agreement between the European Union and the European Atomic Energy Community and their Member States, of the one part, and Georgia, of the other part (European Union, 2014). After that, the reforms were aimed at harmonization with European standards. Georgia does not have a single "digital law," but rather a complex legislative framework, often modelled on European law (TSKHADADZE, 2024). In 2011, the Law of Georgia No. 3144-XIმს-Xმპ "On personal data protection" (2023) was adopted, with the latest amendments made in 2023. In the context of any digitalization, the basis for working with data is precisely the legislation on personal data protection and data processing. Therefore, all the countries considered adopted the relevant regulatory framework. In 2014, the e-Georgia Strategy 2014-2018 Action Plan was adopted, which was aligned with the overall public sector reform. In 2015, the GovTech initiative was launched, covering the development of central digital platforms. According to the World Bank, e-budget, e-prozorro (100% online procurement), e-payments, unified document exchange, and other systems were implemented. The network of physical and electronic services has significantly simplified the process of obtaining services (as of 2020, over 97% of taxpayers filed their tax returns online) (WORLD BANK GROUP, 2022a).

Later, in 2017, another legal act no less important in the context of digital transformation was adopted, the Law of Georgia of 10 May 2017 No. 639-IIს "On electronic documents and electronic trust services" (2017). This law equates electronic documents with paper documents and an electronic signature is recognized as equivalent to a regular signature. In addition, the updated the Administrative Procedures Code of Georgia (1999) was adopted, which introduced the concept of an "electronic individual act". According to the World Bank (2022), legal changes have been key factors in digitalization. Georgia, in particular, has integrated norms similar to EU regulations into its legislation (electronic documents, data protection, cybersecurity, e-procurement, etc.). The criminal code has also been supplemented with articles on cybercrime and

digital signatures. These laws have created a legal framework for the development of digital services (TSKHADADZE, 2024). In 2021–2022, the government adopted a new strategy for the development of the digital sector and approved the Broadband Access Development Strategy 2021–2028 (EUROPEAN COMMISSION, 2023).

The reform program and the results achieved appear to be significant. However, Georgia also faced numerous challenges during the transformation. As Tskhadadze (2024) notes, there was a digital divide between cities and villages. Digital services developed unevenly, and even today this problem is considered one of the most serious. All the countries studied faced the problem of the digital divide. Estonia solved this problem through a state program and active interaction with the private sector. The Georgian government, in turn, combined online services with a network of physical centres. In addition, the state made significant investments in broadband infrastructure. The second problem was the low demand for digital services among citizens. The GovTech Maturity Index (WORLD BANK GROUP, 2022b) shows that Georgia is actively developing basic digital systems, but citizen engagement and the use of e-services are among the uncertain areas, indicating that the gap between the provision of services and their practical application remains.

Thus, Georgia has already overcome a number of problems in the context of digital transformation, and continues to reduce others. However, there are still two important elements that are advisable to adopt in Kazakhstan. The first is the multi-channel service model. The idea of a Public Service Hall is quite universal. Kazakhstan has a developed network of administrative service centres, but it can further develop multi-channel services by combining them with online platforms. The example of Georgia confirms the effectiveness of this concept, as it reduces fragmentation and improves service quality. In addition, Kazakhstan, like Georgia, continues to update its legislation. Georgia's experience shows that it is necessary to ensure a comprehensive legal framework for digitalization: separate laws on electronic documents/signatures, personal data protection, information security, etc. This avoids legal loopholes and gives legal force to electronic procedures (Table 2).

Criteria	Estonia	Georgia	Implications for Kazakhstan
The beginning of digital reforms	Early 1990s, immediately after the restoration of independence	After 2003, as part of administrative reforms	Start time is less critical than consistency and political will
The key legal focus	Codified and systematic laws,	Fragmented but consistent	Kazakhstan should move

	integration with EU law	approximation to EU standards	from fragmentation to systematisation
Digital identification	Single mandatory e-ID with digital signature	Combining electronic identification and physical services	Legislative consolidation of a single digital ID is feasible
Access to services model	Mostly online, digital by default	Multichannel (online + Public Service Halls)	Combining online services with physical centres increases inclusiveness
Interagency data exchange	Centralised X-Road system	Partially centralised exchange	Need for a unified legal framework for interagency data exchange
Cybersecurity	High level of legal and institutional protection	Post-incident development and European integration	Need for a separate law on cybersecurity
Main challenges	Digital divide at an early stage	Uneven use of e-services	The importance of digital literacy and public trust

Table 2 – Comparative analysis of digital transformation models in Estonia and Georgia

The comparative analysis of the experience of Estonia and Georgia permitted to put forward a number of practical lessons relevant for further digital transformation of public administration in Kazakhstan. Firstly, effective digitalisation requires technological solutions and systematic legal consolidation of key institutions, including digital identification and interagency data exchange. Secondly, the multichannel model of access to public services tested in Georgia demonstrates greater inclusiveness compared to exclusively online approaches. Thirdly, Estonia's experience confirms that a high level of trust in digital services is only possible if cybersecurity and data protection regulations are clearly codified. These conclusions justify the expediency of Kazakhstan's transition from fragmented regulation to a holistic model of digital law.

Implementation of digitalization in government agencies in Kazakhstan

In recent years, the Republic of Kazakhstan has made significant progress in the digitalization of state institutions. According to Kazieva et al. (2020), digitalization has become a global trend, opening up new opportunities for achieving key socio-economic goals. In many ways, its success depends on the proper digitization of public administration. The country is undertaking large-scale work to create a unified digital infrastructure and introduce end-to-end technologies. Today, the vast majority of public services are provided online. According to researchers Galy and Bazhaeva (2024), Kazakhstan provides about 93% of public services digitally, including 44 proactive services that have already been used by more than 2 million people. The eGov portal and the eGov Mobile app play a leading role. Through them, citizens have access to more than 1,000 types of public services. The network of public service points has been expanded, and ID cards, QR signatures, and biometric identification are used.

Significant results have also been achieved in the judicial sphere, in particular: the E-Reconciliation service has been introduced; remote participation in court hearings has been intensified; and the Judicial Office platform for submitting documents in electronic format is now operational. According to reports, the registration of cases in courts has been reduced from one hour to 15 minutes, and the transfer of cases to judges from five hours to one. The use of videoconferencing has made it possible to hold over 2,700 hearings without territorial restrictions. The application of digital solutions increases the efficiency and transparency of justice.

The eOtinish service has become an important element of legal digital interaction. It enables the submission of appeals, complaints, and applications in digital format. Its legal status is enshrined in the Administrative Procedural and Process-Related Code of the Republic of Kazakhstan (2020). Such a system increases the accountability of public authorities and allows for the tracking of the entire complaint review process. Moreover, the creation of an official aggregator of electronic petitions has made it possible to expand the mechanisms for digital participation of citizens in public policy. This initiative enables citizens to participate directly in the development of management decisions. Digital technologies contribute to the optimization of both external and internal processes in government agencies. Automating routine tasks improves the efficiency of civil servants. Expanding the capabilities of analytical data processing based on digital platforms gives government agencies the tools to make more informed and timely decisions (Kostyanaya &

SARSENOVA, 2024). Overall, Kazakhstan is actively developing digital interaction with both citizens and between government agencies (Figure 1).

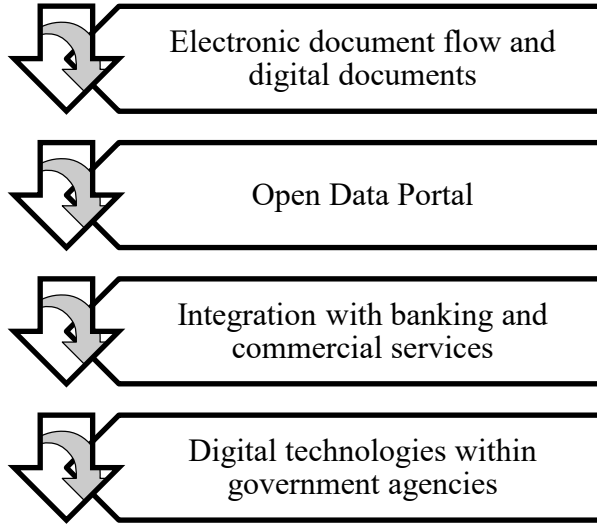

Figure 1 – Overview of digital services and infrastructure in Kazakhstan

Digitalization has a positive impact on the accessibility and quality of public services. According to UN data, in 2022 Kazakhstan ranked 28th in the world in terms of the e-government development index (EGDI) and was among the top ten global leaders in terms of online services (UNITED NATIONS, 2024). This shows how mature the digital infrastructure is and how much potential there is for further development of electronic interaction between the government and society. Today, most government services are available online. According to government data, in 2022, the level of provision of government services in electronic format reached ~93%. The goal is to bring this figure to 100% by 2025. Almost all socially significant services have been digitalized. It should also be noted that by 2022, 92.9% of the population had access to the internet. At the same time, the gap between urban and rural areas narrowed to 4%. More than 77% of settlements are connected to broadband mobile internet. The problem of digital inequality is gradually being resolved, allowing residents of even remote areas to use e-services (ABUOVA, 2025).

The COVID-19 pandemic accelerated digitalization. Under quarantine restrictions, Kazakhstan quickly rolled out new online services. For example, digital passes for travel and distance learning platforms were introduced. The pandemic experience prompted the creation of new standards for process automation and remote access to services. As a result, this had a positive impact

on the economy and led to increased trust in digital tools (OECD, 2023). So, in practice, Kazakhstan has managed to build an effective digital government ecosystem. It is enshrined in legislation and supported by a developed IT infrastructure. This ecosystem is constantly being improved. The state started with simple digitization and is now on the path to successful digital transformation. At the same time, despite the successes achieved, the digitization of public administration is fraught with a number of challenges. Overcoming them requires systematic and consistent work at all levels of government.

Legal challenges of digitalization in public administration and ways to address them

The digitization of public administration in Kazakhstan comes with a number of legal challenges. One of the main challenges is that the regulatory framework is lagging behind rapid technological development. Despite the existing Law of the Republic of Kazakhstan of 24 November 2015 No. 418-V "On informatization" (2015), it requires constant adjustments. For example, between 2016 and 2024, more than twenty amendments were made. But even so, many new digital institutions have not yet received stable legal status. As Karzhaubaev (2024) points out, the current legislation lacks consistency. Many norms are fragmented, and law enforcement mechanisms often rely on subordinate acts and decisions of government agencies rather than on a stable legislative framework. At the same time, legal regulation of the information and digital sphere is carried out primarily in response to challenges that have already arisen. This can pose a threat to legal certainty, as legal entities do not always understand the boundaries of their responsibility.

The problem is exacerbated by the fact that even those technologies that are already integrated into administrative practice do not have a clearly defined legal status. They operate on the basis of departmental acts and pilot projects. In this context, Idrysheva's (2022) remark seems appropriate. The author notes that codification of digital regulation without prior development of legal doctrine and training of specialists could lead to legal and institutional failures. Moreover, according to Article 8 of the Law of the Republic of Kazakhstan of 6 April 2016 No. 480-V "On legal acts" (2016), digitalization is not even included in the list of areas subject to regulation by codes, which formally excludes the possibility of systematization.

Isabaeva (2024) notes the significant fragmentation of legislation in the field of personal data and cybersecurity. In 2024, important amendments were made to the Law of the Republic of Kazakhstan of 21 May 2013 No. 94-V "On personal data and their protection" (2013), including obligations to notify of

violations and expand the powers of state control. However, there is still no comprehensive law on cybersecurity. Sustainable regulation in this area requires flexibility and adaptability. This threat is particularly evident when international standards and the technical specifics of threats are taken into account. Moreover, data protection in digital governance should include not only technical but also institutional safeguards (KOSTYANAYA & SARSENOVA, 2024).

An analysis of law enforcement practices shows that gaps in the regulatory framework negatively affect the effectiveness of government digital services (Table 3). In particular, Sabdenov et al. (2024) found that the implementation of e-government is hampered by the lack of legal regulation of relevant procedures. Kazieva et al. (2022) emphasize in their study that without legislative consolidation of interaction models, the state cannot ensure either transparency or the protection of citizens' rights. All this systematically leads to problems of trust in public digital services (GALY & BAZHAEVA, 2024).

Services	Share of digital services (%)	Description
Registration	High	Digitalisation of procedures outstrips their legislative consolidation
Social services	Medium	Need to improve accessibility and legal safeguards
Licensing procedures	High	Active use of by-laws
Local services	Uneven	The impact of the institutional capacity of the authorities

Table 3 – Share of public services provided in digital form in Kazakhstan

A synthesis of data on digital public services confirms the imbalance between the pace of e-services implementation and the level of their regulatory support. Legal aspects are complicated by the cultural and value characteristics of the digitalization process. Borrowed models of digital governance do not always correspond to local legal traditions. “Digital transformation is a phenomenon of Western civilization that is not a natural stage in the development of Kazakhstan” (SARTAEVA, 2024). This creates an additional challenge, namely the need to adapt norms and practices to the socio-cultural realities of Kazakhstan. International organizations confirm the conclusions of Kazakhstani experts. In its 2023 reports, the OECD emphasizes that even with a high share of digital public services, key issues remain unresolved, in particular: responsibility for digital actions; the legal status of digital data; protection

against cyber threats; and the stability and predictability of law enforcement (OECD, 2023).

Summarizing the identified problems of legal support for the digital transformation of state authorities in Kazakhstan, it is advisable to emphasize the need for their structuring. This approach helped understand the sources of legal uncertainty, as well as develop a more targeted regulatory response strategy. Based on the analysis, it is proposed to classify the challenges of digitalization into four main groups. First, regulatory problems, which include: fragmentation of legislation; untimely adoption of legal acts; instability of legal regulation of digital tools. Second, institutional challenges, which consist in the absence of specialized bodies or interagency mechanisms for coordinating digital policy. Third, procedural gaps, which cover digital practices not fixed at the law level, as well as the absence of formalized procedures for algorithmic decision-making. Finally, ethical aspects relate to the transparency of digital processes, the protection of personal data, and the prevention of digital discrimination. This classification creates the basis for the further development of a comprehensive legal doctrine of digital transformation, which will combine the flexibility of the innovation environment with the principles of legal certainty and the protection of human rights (Table 4).

Issue category	Essence	Results
Regulatory	Fragmentation and instability of legislation; lack of a systematic codified approach	Legal uncertainty; conflicts; low predictability of law enforcement
Institutional	Lack of interdepartmental coordination; lack of specialized bodies managing digital transformation	Policy fragmentation; duplication of initiatives; low effectiveness of digital reforms
Procedural	Unformalized digital procedures; lack of legal status for algorithmic decision-making	Weak legitimacy of digital services; declining trust in e-government
Ethical	Risks of digital discrimination; lack of transparency of digital processes; insufficient level of personal data protection	Violation of human rights; decline in trust in the state; threat to digital justice

Table 4 – Classification of Kazakhstan's digital transformation problems

Thus, the legal problems of digitalization of public administration in Kazakhstan are systemic and multilayered. Their solution requires large-scale

institutional reform. Moreover, the lag of the regulatory framework can only be overcome by moving to a proactive regulatory model. As a systemic solution, the Ministry of Digital Development has already included in the government plan the preparation of a unified "Digital Code" and Law "On cybersecurity". Both projects are designed to codify disparate norms and consolidate uniform definitions of key terminology (OFFICIAL INFORMATION SOURCE OF THE PRIME MINISTER OF THE REPUBLIC OF KAZAKHSTAN, 2023). In addition, it is necessary to take a number of other steps to reduce existing challenges.

Firstly, it is important to expand the provisions of the Law of the Republic of Kazakhstan of 6 April 2016 No. 480-V "On legal acts" (2016). It is necessary to include digitalization, data processing and cybersecurity in the areas subject to regulation by codes. This will make it possible to legalize the very format of the future Digital Code. Secondly, it seems appropriate to establish a permanent regulatory experimental regime under the Ministry of Digital Development with the participation of the National Bank and specialized public organizations. The results of the work of such a platform can become an empirical basis for the prompt adjustment of the provisions of the future digital code. On the one hand, their work will prevent the obsolescence of norms in the context of accelerated technological dynamics. On the other hand, it will reduce the regulatory barrier for start-ups developing software for government agencies. The effectiveness of a similar mechanism has already been confirmed by the National Bank in the digital assets market and will likely be in demand when developing new legal acts in the digitalization industry (GRESHNIKOV & KHAMIDULLINA, 2024).

Thirdly, it is advisable to base the formation of new regulatory norms on a three-tier system of trust guarantees. The technical level should provide for the mandatory use of reliable cryptographic protocols and regular independent audit of the source code of information systems (SEITMURATOVA, 2025). The institutional level involves the creation of an autonomous data protection authority. This body should be empowered to issue mandatory orders and apply sanctions. Such institutional changes are consistent with the recommendations of the latest OECD review (2025). Finally, the procedural level should include the principle of appealability, which ensures the possibility of reviewing decisions made by automated state systems in a judicial or quasi-judicial manner.

Thus, the comprehensive implementation of these levels will overcome departmental disunity. In addition, a holistic approach will ensure the formation of an adaptive regulatory architecture. The introduction of the Digital Code together with the regulatory mechanism will eliminate the fragmentation of the

existing regulatory framework. Moreover, such an approach will provide the prerequisites for advanced legal evolution.

DISCUSSION

The prospects for the development of legal regulation of the digital transformation of state bodies of Kazakhstan at the present stage are focused on the formation of a holistic and adaptive regulatory framework. The focus is on the idea of creating a Digital Code. This procedural act should become a single codified document that combines norms and eliminates fragmentation. Its development was initiated in accordance with the instructions of the President in 2022. This initiative has become an unprecedented step in the legislative practice of Kazakhstan and has caused a wide discussion in the scientific and professional environment. The concept of the project involves the consolidation of existing regulations. In addition, the project should introduce new legal structures, including: the right to delete personal data; legal regime of smart contracts; experimental legal regimes for testing digital solutions.

Digital identification, algorithmic management, platform ecosystems and automated processes are also considered among the priority areas. These provisions are of particular relevance in the context of civil law turnover. Nusipzhanov et al. (2025) emphasise the need for normative consolidation of the legal capacity of digital objects and participants. The researcher points to the emergence of new categories that require a special legal regime and procedural infrastructure. Galy and Bazhaeva (2024) also give a positive assessment of the codification initiative, pointing to the need to move from fragmented regulation to a unified regulatory model. In their opinion, the Code should enshrine the fundamental principles of digitalization. The researchers emphasize that along with traditional principles (legality, transparency, accessibility), new concepts in the field of digitalization should be enshrined in the regulatory framework.

At the same time, the concept of creating a Digital Code requires an assessment of its compliance with the current constitutional and legal framework. The Constitution of the Republic of Kazakhstan (1995) does not prohibit the introduction of new forms of codification. However, the current model of legislative structuring focuses primarily on sectoral codes rather than cross-sectoral ones. Changes are needed in terms of the subjects of codification and acceptable forms of systematization of the normative body. The implementation of such an initiative should be carried out exclusively at the level of parliamentary lawmaking, which will ensure the legitimacy and stability of the new legal architecture. Thus, the prospect of introducing a Digital Code is entirely justified, but requires proper regulatory formalization and constitutional coordination.

However, criticism of the project remains. Idrysheva (2022) draws attention to the fact that digitalization as an area is not included in the list of industries subject to regulation by codes under the Law of the Republic of Kazakhstan of 6 April 2016 No. 480-V "On legal acts" (2016). She also emphasizes that the legal doctrine and human resources are not yet prepared for a large-scale legislative initiative. Moreover, premature codification without a methodological basis may exacerbate fragmentation. The complexity of the situation is aggravated by the lack of a scientifically based glossary of digital concepts.

Similar positions are expressed by Kostyanaya and Sarsenova (2024). They emphasize that digital transformation requires flexible legal regulation. This is especially relevant in the context of rapid technological changes in the areas of information security and data protection. Their works note the need to create mechanisms for the flexible interpretation of digital norms. In addition, it is worth paying attention to the cultural and value characteristics of Kazakhstani society and adapting new solutions to this context (SARTAEVA, 2024). Thus, the key direction in the development of legal regulation is the preparation and comprehensive discussion of the concept of the Digital Code of Kazakhstan. Successful implementation of this project is possible only if there is scientific justification and institutional readiness. In general, Kazakhstan has laid a solid foundation for the future development of the digital state. With the correct adaptation of the experience of other countries and a step-by-step approach, digital transformation projects have enormous development potential.

CONCLUSION

In recent years, the digital transformation of government agencies in Kazakhstan has gone from setting ambitious goals to achieving specific results. Legal issues of digital transformation of government agencies in Kazakhstan are becoming increasingly important against the backdrop of the rapid introduction of new technologies. These processes pose the task of not just adapting the current legislation, but also deeply revising and transforming it. It is aimed at creating a sustainable, holistic and predictable regulatory environment.

Having analysed various approaches to defining this concept, digital transformation is a multifaceted phenomenon. Digital transformation of government agencies is a complex process of deep transformation of their activities under the influence of modern digital technologies, accompanied by a revision of internal processes, structures and methods of work, in order to significantly increase the efficiency of management, which ultimately leads to significant socio-economic benefits for society.

Analysis of Estonia and Georgia's experience in the field of digital transformation of public authorities permitted to make a number of meaningful generalizations that are of practical value for Kazakhstan. Despite different political orientations and levels of integration into European structures, both countries have demonstrated consistency in implementing digital transformation. They formed an appropriate regulatory framework, created the necessary infrastructure, and promoted electronic services. At the same time, a characteristic feature has been the desire to ensure a balance between innovation and legal certainty.

Examples of effective policies include the creation of a unified electronic identification system (e-ID) in Estonia and the concept of multi-channel access to services through Public Service Halls in Georgia. The most relevant for Kazakhstan are: regulatory codification of digital processes (as in Estonia), systematic integration of offline and online services (Georgia), and active participation of international partners in financing and supporting digital reforms. Thus, a critical rethinking of foreign experience can contribute to the development of a national digital governance strategy that takes into account both global standards and national characteristics.

Regulation has evolved from the first laws on electronic documents to modern acts covering issues of data, digital assets, and security. Thousands of electronic services have been implemented and an e-government infrastructure has been built. At the same time, some legal challenges related to the fragmentation of legislation remain. The key direction in solving the identified problems is the initiative to create a Digital Code capable of overcoming fragmentation. At the same time, the most important conditions for the effectiveness of such a document are the development of a legal doctrine and a broad expert discussion.

In contrast to the predominantly descriptive studies of the digitalisation of public administration, this study makes a conceptual contribution to legal science by formulating a holistic legal vision of digital transformation as an independent object of legal regulation. The article proves that digital transformation of public authorities is not limited to the introduction of electronic services, but requires a rethinking of the structure of public law relations, mechanisms for exercising power and guarantees of human rights protection in the digital environment. The authors' proposed definition of digital transformation in public administration, as well as the classification of legal problems of digitalisation (regulatory, institutional, procedural and ethical) can be used as an analytical tool in further theoretical and applied research. Thus, the article expands the doctrinal boundaries of digital law and creates the basis for

the formation of a systemic model of legal regulation of the digital state in countries with a transitional legal system.

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