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# The paradigm of the digital society: synthesis of technocratic and socio-humanitarian approaches

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**ABSTRACT**

Digitization is a global trend that influences the identification of modern states, societies and individuals. The digital civilization sets new development conditions for contemporary states. The aim of this research is to present the paradigm of forming a digital society in Kazakhstan, which is in a state of catching-up modernization, requiring consideration of numerous factors. The methodology of comparability of states, vectors, principles and approaches, as well as the goals of the digital transformation concept (developed for the years 2023–2029), Information and Communication Technology and cybersecurity development, and a comparative analysis of digitalization statistical data have been applied. The article employs a triangulation method: it analyzes data from an international digital readiness index study, examines and visualizes national statistical data and digitalization program indicators and presents the results of a sociological study on societal digitalization conducted by the authors. A SWOT analysis of the conditions, contradictions, risks and opportunities for Kazakhstan has presented the concept of the digital society paradigm. Comparative discourse analysis of disciplinary approaches to the study of digitalization leads to the conclusion of the necessity of the digital society paradigm in the context of comparability of technocratic and humanitarian understanding and critical analysis of the achievements, opportunities and risks of societal digital transformation.

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The technocratic and humanitarian dilemma; indicators of digitization; Kazakhstan; interdisciplinary approach; digital society paradigm; risks and prospects of digitization; SWOT analysis

**SUBJECTS**
Central Asian; Russian & Eastern European Studies; Philosophy of Social Science; ICT



## 1. Introduction

The process of digitalization and the paradigms of the digital society are the subject of extensive literature and diverse approaches. Our selection of theoretical concepts is guided by the focus of the research subject.

States are in different dispositions toward the digital process, which is associated with specific technological, socio-economic, political, cultural and other conditions and factors that are important to consider. Since the latter third of the 20th century, the digital reality and technological culture have been linked to the era of post-industrial society (Bell, 1973), which has many connotations depending on the context of disciplinary study and delineation of the subject area.

For technologically driven states, such as Japan, the concept of a digital society has been associated with a national idea (Masuda, 1983). For most states at the forefront of industrial development (such as the USA), digitization has been a consistent and logical way to transition from the industrial to the postindustrial stage.

In terms of geopolitical mapping, for over three decades, Kazakhstan has developed as a state of catching-up modernization. Since the 1990s, following the end of the Soviet era, Kazakhstan has been developing a new economic model. Over the past three decades, the country has been transitioning from an agrarian-industrial stage of socialist development to a modern market-oriented economic system. This transition coincides with trends of globalization and the rapid development of the digital world.

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Therefore, the need for digitization coincides with the solution of tasks of transitional economy, changes in social structure and the search for national-state identity. These conditions and factors determine the contexts of studying the digital society. It is crucial for us to comprehend the challenges of developing a digital society in Kazakhstan. Since Kazakhstan is being studied in the international ranking of readiness for digitization, it is important to understand what the level of digitization represents (and what it is comparable to). This is necessary to identify Kazakhstan's position in the process of moving toward a digital society and self-identification in the geopolitical landscape of innovative transformations.

It is crucial for us to understand the stage of digitalization in Kazakhstani society compared to other countries and identify the transformations required to avoid falling behind. In our approach, the primary objective is defined as analyzing the digitalization process in Kazakhstan within the context of its technological and socio-humanitarian parameters. This represents a new direction in Kazakhstani socio-humanitarian research. Accordingly, in 2024, the authors conducted an innovative national sociological study of the digitalization process. Its organization and interpretation necessitated the examination of various theoretical concepts of digitalization.

The study of digitalization theory revealed the absence of a universal theoretical model in contemporary science, highlighting the need to account for country-specific characteristics. We believe that an interdisciplinary approach is most productive in this context. This is justified by the complexity of the research subject (the digitalization process in Kazakhstan) and requires the application of a system of socio-humanitarian methods.

Researchers note that theories of digitalization employ multi-actor and multi-criteria evaluation methods. These methods consider the impact of technologies on various groups and societal processes. Digitalization presents complex challenges, and its analysis must incorporate an ethical focus and existential aspects, such as issues of equality, social responsibility, sustainability, data privacy and more (Lindell, 2024).

One of the integrating factors, both in reality and in various discourses, is the semantics of the digital society, which includes the vocabulary of digital reality and the digital world, digitization processes, the essence of digital identification and the understanding and definition of digital identity. A common scientific and colloquial thesaurus of the digital society is being formed, and its theoretical constructs and concepts are being comprehended in various disciplinary studies. The digital perspective of civilizational development unites interdisciplinary paradigms of technical and socio-humanitarian knowledge. Informational discourses are developed both within disciplinary studies and in their synthesis. The multidisciplinarity of the digitization process implies economic, socio-philosophical, ethical, legal, sociological, technical-technological and other projections and indicators.

The 21st century is characterized by the intensive integration and proliferation of digital and information-communication technologies into social reality, giving rise to a new type of society – the network society. Its social structure is built around networks activated through digitized information and based on microelectronic communication technologies (Castells, 1998).

Manuel Castells conceptualized the functioning of the Internet through a metaphor, referring to it as a 'galaxy', and introduced the concept of network identity. As a result of networking processes on the Internet, individuals – its users – began to develop their own network identities, which virtually overlay their real identities. Physical space and cyberspace merge, serving as the material foundation for 'networked individualism', and form new models of social interaction between individuals, citizens and the state (Castells, 1997).

Thus, network structures, diverse virtual communities and their supporting platforms, access to network resources, technical capabilities and proficiency in information-communication technologies have become key indicators of the civility of societies and the success of individuals.

In the context of the development of the digital society, alongside socio-economic transformations already conditioned by the automation of life, there is objectively increasing inequality in access to goods, resources, opportunities and participation in politics at the individual level, affecting the majority of people. Digital divides emerge within states and between countries. The digital

divide becomes implicit in all areas of human activity and leaves those without resources further and further behind. Questions about the universalism of the Society 5.0 paradigm are increasingly being raised.

Inherited digital inequality encompasses economic class, gender, sexuality, race and ethnic background, aging, disability, healthcare, education, rural residency, networks and global geography. Implicit forms of technological inequality are generated by platform economies, automation, big data, algorithms, cybercrime, cybersecurity, gaming, emotional well-being, assistive technologies, civic engagement and mobility (Robinson et al., 2020). Thus, the complex of digital inequality encompasses intricate levels that have both humanitarian and technological indicators and projections, hence the importance of their comprehensive study.

Key questions regarding the integration of new technologies into social and political structures are explored within the framework of philosophical and practical approaches. A fundamental condition for this integration is ensuring equitable access to artificial intelligence technologies, which is crucial for preventing the exacerbation of digital inequality and fostering the global ethical development of technologies. Artificial intelligence transforms fundamental human capabilities – such as health, access to information and social engagement – on a scale comparable to historical revolutions (e.g. the agricultural and industrial revolutions). This technology not only enhances human potential but also becomes an integral part of the conditions necessary for realizing these potentials (Buccella, 2022).

At the same time, the postmodern condition gives rise to phenomena such as digital inequality. This issue 'can be understood as the unequal or differentiated use of available technologies, infrastructure, services, facilities, and information' (Kuhn et al., 2023). Within the framework of digital inequality theory, it is essential to consider structural, behavioral and psychological factors that either exacerbate or mitigate the digital divide. The divide is defined as the gap between individuals with sufficient access to digital technologies and the skills to use them and those whose access and skills are limited.

To assess readiness and ability to use digital technologies, the concept of 'digital confidence' is proposed as an indicator. This new theoretical construct encompasses awareness, familiarity with technologies and a sense of competence (Bentley et al., 2024).

The rapid development of the digital society is altering the problem thematic contexts of its study. Scholars are focusing on the content and character of the digitization process, analyzing its explicit and implicit manifestations. Research leads to comparability and typology of digital inequality, digital divide, which accompany this process, and explores the nature of digital inequality and the risks it generates (Van Deursen & Van Dijk, 2011).

The study of digital stratification is intensively conducted, with types and characteristics being distinguished. Digital inequality is proposed to be considered as a social rather than a technological problem, and to be analyzed based on theories of economic, social, cultural and political stratification (Ragnedda, 2017).

The concept of Society 5.0 receives not only scientific justification but also a declaration of political intentions. Participants of the World Summit on the Information Society in Geneva in 2003 declare 'our common desire and determination to build a people-centered, inclusive, and development-oriented information society, where everyone can create, access, utilize, and share information and knowledge, enabling individuals, communities, and peoples to achieve their full potential in promoting their sustainable development and improving the quality of their lives, based on the purposes and principles of the Charter of the United Nations and in full respect and support for the Universal Declaration of Human Rights' (WSIS Executive Secretariat., 2003).

In the transition to the digital civilization, there is a renewal of the scientific discourse on societal typologies, digital reality, methods and approaches, disciplinary status of digitization and digital transformation research processes. In this context, the phenomenon of the so-called 'long wave of socio-economic evolution of humanity' is being explored. The evolution of humanity from the Stone Age to Society 5.0 is conditioned by the succession of corresponding metaparadigms.

The first metaparadigm is grounded in the mastery of the material world (Stone, Bronze, Iron Ages), the second metaparadigm is associated with the mastery and transformation of energy (water, steam, electricity, combustion) during the industrial revolution. The contemporary metaparadigm focuses on the understanding and transformation of information (Hilbert, 2020).

The transition to the fifth technological revolution and to the society of the 21st century has:

- Sharpened contradictions associated with the digital transformation of societies, including those between technocratic and humanitarian vectors of development,
- Revealed problems of civilizational transformation as an environmentally sustainable, rather than catastrophic process,
- Demonstrated rapidly growing inequalities in various projections and manifestations, ranging from national to individual levels,
- Highlighted the issue of justice and ensuring access to digital resources and opportunities for all members of society.

In a philosophical context, the process of society digitization as a global trend threatens new forms of social alienation, dismantling of the social state, digital ideological totalitarianism, depersonalization of individuals into avatars. Scholars warn of existential risks associated with the dominance of the digital environment, where it becomes the sole existential value (including significant reduction in individuals' ability to find meaning beyond augmented reality, erasure of the existential component of human communication, loss of privacy in the personal sphere and others) (Shelkunov & Karimov, 2019).

Kazakhstani researchers conclude and recommend distinguishing two formats of digitization impact on processes of economic, social, cultural, and political stratification: (1) the reproduction (including with varying degrees of modification) of traditional forms of inequality in the digital sphere, and (2) the inherent logic, algorithms and dynamics of digital divide action, the creation of new forms of social stratification through digital technologies, up to the extent of 'digital discrimination', the formation of a system of digital inclusion/exclusion, etc. (Kurganskaya & Dunaev, 2021).

The concept of digital capital is suggested, which is viewed as a specific type, closely intertwined with five other types of capital: social, political, economic, human and cultural (Ragnedda & Ruiu, 2020).

The drive towards digital globalization leads to the deprivation of the vital foundation of human existence, creating an artificialization of human life, and 'enhancing evolutionary drift in the transhumanist direction. "Calls are made to" incorporate a philosophical, critical perspective to see how much deeper sides' of digitization emerge along the lines of building Society 5.0, leading to an understanding of the unity of this project with the ideological underpinning of the transhumanism concept (Shelkunov & Karimov, 2019).

The theoretical approaches presented explicitly and implicitly reveal the issue of the interdependence between the technocratic and socio-humanitarian dimensions of digitalization.

## 2. Materials and methods

Based on the subject of the study and considering the thematic and contextual diversity of theoretical approaches, we tailored our research framework to align with current social demands in Kazakhstan. These demands include addressing the following questions:

- How do international and domestic experts evaluate the digitalization process?
- What achievements and challenges in digitalization are observed by Kazakhstani experts?
- What is the generalized profile of a Kazakhstani Information and Communication Technologies (ICTs) user?
- What risks are associated with digitalization?
- Are there contradictions between technocratic, technological and socio-humanitarian aspects of digitalization in Kazakhstani society?
- Is it possible to explain the digitalization process in Kazakhstan within the framework of existing theories of the digital society?

The study utilized:

- Data from international reviews of the Network Readiness Index (NRI) (2022, 2023);
- Statistical data from governmental bodies regarding the development of ICTs in households, and the digital culture of Kazakhstani citizens (Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan, 2022);
- The digitization program (Government of the Republic of Kazakhstan, 2023);
- The data from the sociological study titled *'Kazakhstani Society in the Context of Digital Transformation: Prospects and Risks'* (Institute of Philosophy, Political Science and Religious Studies, Committee of Science, Ministry of Science and Higher Education of the Republic of Kazakhstan, 2024), conducted by the authors of the article.
- Scientific articles and reviews by foreign and Kazakhstani authors.

The study tested the following hypotheses:

a. The indexing of Kazakhstan's digital status in international rankings does not capture the humanitarian dimensions and the complex, contradictory nature of the emergence of a digital society.
b. Digital inequality persists across various sectors of society.
c. Users exhibit varying levels of digital competencies, skills and demands; gaps are evident across generational, socio-professional, educational and other identifying characteristics of individuals and households.
d. There is no consensus within the expert community regarding the achieved level of digitalization, with evaluations of risks and consequences lacking uniformity.
e. Measurements of digital development reveal areas of social, technological, humanitarian and political contradictions, necessitating the development and implementation of state strategies to address them.

In 2024, the authors conducted a comprehensive sociological study titled *'Kazakhstani Society in the Context of Digital Transformation: Prospects and Risks'.* The study's methodology, conceptualization and theoretical analysis were developed by the authors, while the fieldwork and initial empirical data processing were carried out by BRIF Research Group (Kazakhstan, Almaty, https://www.brif.kz/).

The purpose of the population survey was to identify and analyze public opinions on issues related to the digital development of society. The research objectives included collecting information and identifying public perceptions regarding:

- The most in-demand Internet functions in the everyday lives of Kazakhstani citizens,
- The perceived level of digital technology adoption in Kazakhstan, and
- The positive and negative consequences of digitalization.

The quantitative survey involved 2000 respondents and was conducted using face-to-face street interviews based on a questionnaire programmed for tablets (CAPI) near the respondents' residences. The target audience consisted of Kazakhstani citizens aged 18 and older, residing in their respective localities (city or village) for at least 6 months. Quotas within each region were established by ethnicity, gender and age, calculated using statistical data from the Bureau of National Statistics as of early 2023.

The study employed a stratified random probability sampling method. The strata included 17 regions of Kazakhstan and the cities of national significance: Astana, Almaty and Shymkent.

The objective of the expert opinion study was to identify expert assessments of the digitalization process in Kazakhstan, including its risks and impacts across various spheres of society. The expert survey was conducted using a semi-structured interview format via telephone, with a questionnaire programmed for tablets (CAPI). The target groups included scholars and experts in IT technologies, representatives of executive and local government bodies responsible for implementing digital transformation, managers of various organizations and companies with experience in digital projects, researchers from scientific

institutions (cultural studies experts, psychologists, sociologists), university lecturers, IT specialists, bloggers, journalists and social media managers. A total of 102 experts participated in the study.

Quantitative data and indicators of the digitization process were examined through comparative analysis, visualized, and critically evaluated. The paradigm of the digital society for Kazakhstan was conceptualized through discourse analysis of scientific publications and government programs. The characteristics of the digitization process were identified through SWOT analysis.

The results of the sociological and statistical data analyses have been systematically organized and visualized by the authors of the article.

## 3. Results

### *3.1. Discourse on problem-thematic contexts of research on the digital society in Kazakhstan*

Since the 1990s, Kazakhstan has entered a stage of development of modern Kazakhstani statehood, which coincided with intensive globalization processes on one hand, and the formation of a new market structure on the other. The state and society found themselves in a situation of no alternative development choice and became involved in a tense process of catching-up modernization amidst increasing global competition. In a relatively short period conducive to socio-cultural transformations, Kazakhstan had to implement transformations across all major spheres of life, develop new value paradigms and acquire subjectivity in the international political, economic and technological space. Targeted state projects and programs were developed in Kazakhstan as paradigms for intensive integration into the modern world, with tasks aimed at achieving competitiveness in the economy, politics, and intellectual culture.

Since the 1990s, a stage of development of modern Kazakhstani statehood has begun, coinciding with intensive globalization processes. The state and society found themselves in a situation of no alternative development choice and became involved in a tense process of catching-up modernization amidst increasing global competition. In a relatively short period conducive to socio-cultural transformations, Kazakhstan, as a late-starting state, had to implement transformations across all major spheres of life, develop new value paradigms and achieve competitiveness as a new state entity.

In the technogenic civilization, new ontological foundations are being created and reproduced, where the digital persona no longer requires ethical codification, increasingly diverging from humanitarian attributiveness and swiftly transforming into an avatar. In the contemporary world, social groups have transitioned from being fundamental elements of social existence to entities within the virtual realm of existence. These virtual strata, spontaneously emerging and just as unexpectedly dissipating 'communities' (Bauman, 2002), become modeling systems of identity (Kurganskaya et al., 2022).

Kazakhstan's society is entering the global information space, presenting domestic researchers of the information society with complex methodological search tasks (Kussainova, 2021). Economic contexts of digitalization are being studied (Kozhakhmet, 2019). It is anticipated that digitalization will impact all sectors and lead to changes in the overall economic structure of Kazakhstan by diversifying and unlocking the potential of non-extractive industries, fostering startup activity and creating 'new industries' such as e-commerce, the IT sector and the financial industry (Francesco et al., 2020). The interdisciplinary nature of research on the digitalization process is substantiated by the integration of economic and sociological approaches, which enriches and refines the theoretical framework. This integration enhances the accuracy of measuring macroeconomic dynamics by reflecting them through the perceptions of citizens (Jopling et al., 2025). Governmental policies on digitalization are under investigation (Duisembayeva, 2020).

Philosophers turn to research methodology for digital identification, as the convergence of Hi-Tech and Hi-Hume technologies becomes an axiological 'cloud' elucidating the transformation of socio-humanitarian ontology (Kurganskaya & Dunaev, 2020). The degree of readiness of Kazakhstani society for digital technologization and verification against the newest type of society 5.0 does not negate researchers' concerns for humanitarian development. Human dimensionality and ethical aspects of digitalization are integrated into the national mindset (Sartaeva, 2020). Philosophers, political scientists, and cultural scholars are tasked with developing a concept of spiritual and value orientations for

the digital transformation of Kazakhstani society (Sartayeva et al., 2020). This is associated with the practical realization of the opportunities of the digital society for Kazakhstan's competitive identity in the new technological framework of modernity, which presupposes identifying significant risks of identity loss.

### 3.2. International indicators of digitalization in Kazakhstan: a comparative analysis

Research on digital Kazakhstan employs two approaches: international and domestic. For self-identification in the space of the new world order, it is necessary to present measurements in accordance with international criteria developed by authorized institutions and used in the practice of defining countries' rankings (The Digital Economy and Society Index, The Global Innovation Index). The process of self-identification in the digital reality predominantly involves technocratic approaches to measuring the achieved level of societal development and does not consider humanitarian forecasts.

Currently, Kazakhstan is represented in competitiveness rankings not only in terms of economic but also social and humanitarian development dimensions. The NRI is one of the leading global indicators of the application and effectiveness of ICTs) in the economy worldwide. According to indicative measurements, Kazakhstan is included in the structure of the NRI (2022) among 131 countries, and in 2023 among 134 countries.

In the NRI (2022) ranking review, three CIS countries with their corresponding positions in the global NRI are listed: the Russian Federation (40th place), the Republic of Kazakhstan (58th place) and Armenia (64th place). In the NRI results for 2022 in the section 'NRI Indicators by Income Groups' regarding Kazakhstan:

- It is noted that Kazakhstan's strongest area of network readiness is related to people (49th place), reflecting the continuous adoption of ICT by individuals (36th place), followed by a similar investment structure in business promotion involving digital technologies (55th place);
- It is stated that concerning governance (55th place), improvements in content privacy protection by law (120th place) and the regulatory framework in the field of ICT (127th place), further strengthening of these country-level indicators is necessary;
- Predictive conclusions are drawn that Kazakhstan could expand the influence of its network readiness by focusing on exporting ICT services (112th place) and encouraging applications for PCT patents (72nd place).

The overall assessment (NRI, 2022, 2023) is as follows: 'Overall, Kazakhstan has achieved remarkable trust (49th place) in digital technologies, as well as in the quality of life (40th place), both of which support the achievements of the economy in the region'.

As stated in the report, the main advantage lies with people, and the greatest opportunities for improvement are related to technology.

If in 2022 Kazakhstan was not compared in the scale of changes in the achieved level in international network readiness rankings, in 2023 such an opportunity arises due to the standard indexing of 4 components (technology, people, governance and impact), as well as 12 subcomponents and 58 variables.

Comparing the four indicators from 2022 with those of 2023 indicates that in 2023 Kazakhstan remains in the 58th place overall among the surveyed countries in the NRI. The indication for the 'People' criterion remains unchanged – 49th position. The position decreases for the 'Technology' indicator, while there is a significant increase for the 'Impact' and 'Governance' indicators (Figure 1).

From the comparison of the 12 indicators for the years 2022 and 2023 (Table 1), a tendency towards their slight variability is noted (except for indicators such as the increased role of the Government, the economy and the decreased role of individuals). The highest indicators are associated with inclusivity, quality of life and the Government. The authors of the report note that more could be done to improve economic indicators in terms of contributing to sustainable development goals, future technologies and regulation (NRI, 2022, 2023).

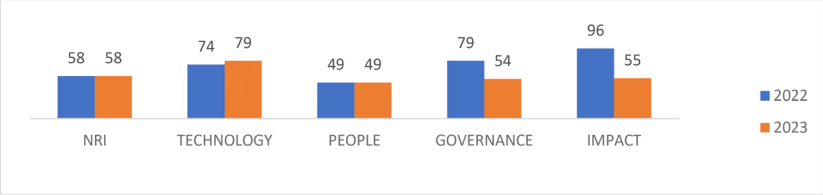


**Figure 1.** Global NRI position of Kazakhstan.
Source: Quantitative data were derived from sources NRI (2022, 2023), and visualized by the authors.
The figure was compiled by the authors based on the content analysis of the NRI reports for 2022 and 2023.

**Table 1.** Kazakhstan rankings by sub-pillar.

| | 2022 | 2023 | | 2022 | 2023 |
|---|---|---|---|---|---|
| Pillar/sub-pillar | Rank | | Pillar/sub-pillar | Rank | |
| Inclusion | 42 | 35 | Businesses | 55 | 56 |
| Quality of life | 40 | 35 | Economy | 78 | 63 |
| Governments | 64 | 48 | Content | 79 | 82 |
| Trust | 49 | 48 | SDG contribution | 84 | 88 |
| Access | 49 | 52 | Future technologies | 96 | 98 |
| Individuals | 36 | 54 | Regulation | 102 | 104 |

Source: This table was compiled by the authors based on content analysis of sources of NRI (2022, 2023).

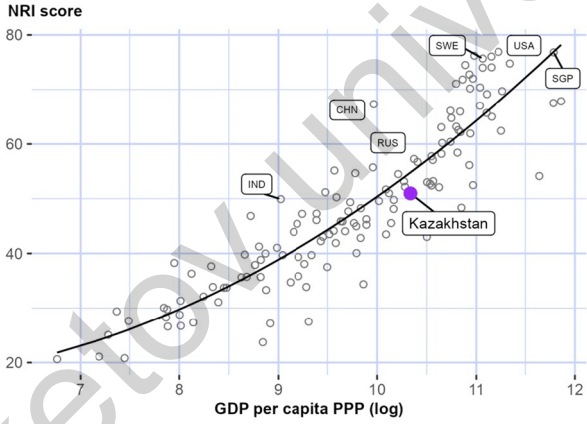


**Figure 2.** NRI score and GDP per capita PPP (log)*.
USA = United States (rank: 1), SGP = Singapore (rank: 2), FIN = Finland (3), NLD = Netherlands (4), SWE = Sweden (5), CHN = China (20), IND = India (61). Kazakhstan belongs to the group of upper-middle-income countries, where the best performer is China (CHN). The top performer of its region-CIS-is Russian Federation (RUS).
Source: NRI (2022).



In the NRI (2023) review, Kazakhstan's position in the hierarchy of digitalization leaders was visually presented for the first time, including the United States, Sweden, Singapore, China and compared with Russia, which is close to Kazakhstan in some indicators (Figure 2).

According to the Global Innovation Index ranking for the year 2022, Kazakhstan occupies the 79th position (77th place as of 2023), indicating an insufficient level of technological development. In 2022, the regional venture investment market was estimated at 60–80 million dollars. Several new private venture funds with a capital of 100 million dollars were launched in 2022 (MyVentures, Tumar Venture Fund, Big Sky Capital, etc.). According to MOST Holding, the average size of venture deals in Kazakhstan was 360 thousand dollars in 2021 and increased to 800 thousand dollars in 2022. This indicates that private investors are interested in the Kazakhstani market. In the coming years, high growth is forecasted as the market is still undercapitalized. The government's intentions to change Kazakhstan's position in the Global Innovation Index ranking from 77th in 2023 to 41st in 2029 require bold political and managerial decisions (Figure 3). We find this forecast to be unduly optimistic.

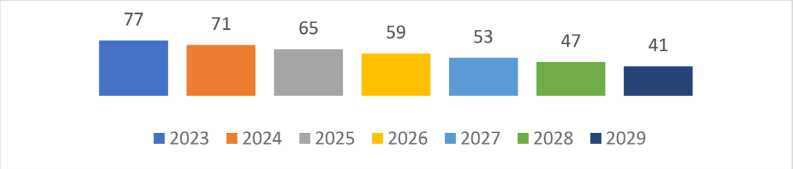


**Figure 3.** Kazakhstan's position in the global innovation index ranking (reality and intentions).
Data calculated based on the Government of the Republic of Kazakhstan (2023) and visualized by the authors of the article.

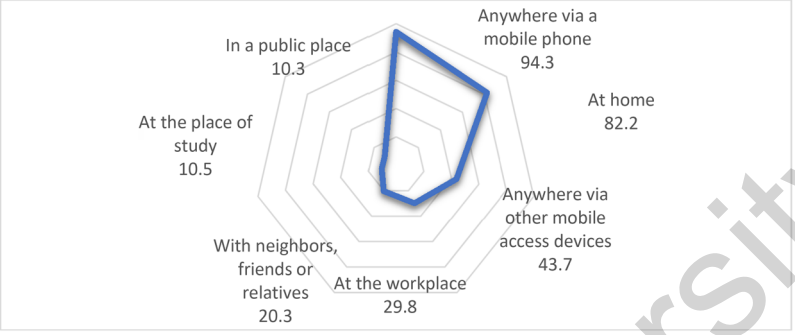


**Figure 4.** The main places where the Internet is used (% of the total number of users).
Source: Quantitative data were sourced from the Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan (2022) and visualized by the authors.

### *3.3. Reconstructing the image of digital Kazakhstan through technical capabilities and humanitarian dimensions*

Analysis of digitalization statistical data reveals that:

- The proportion of households with Internet access has not yet reached full saturation and stands at 94.5% of their total number.
- The predominant types of Internet access are mobile broadband connections (83%) and fixed (wired) broadband connections (43.3%).
- Almost all households have mobile phones (98.8%) as a means of network access.
- Portable computers (laptop, netbook, ultrabook) at 63.7% prevail over desktops (49.9%), while tablets are even less accessible at 38.1%.

The availability of TV lines as an information source is associated with satellite TV (31.8%), Internet Protocol Television (IPTV) (9.4%) and digital terrestrial TV (7.1%) in households. It is noteworthy that the significance of TV is decreasing compared to other means of informing the population, while consumers actively engage with TV entertainment programs (shows, concerts, series).

Internet accessibility for users determines its use in the social space. We can describe a hypothetical portrait of 'a digital persona' who uses mobile Internet via a phone almost everywhere (Figure 4).

In Kazakhstan, Internet accessibility is ensured on one hand. On the other hand, the quality of Internet connections varies across different regions.

The targeted use of the Internet is associated with information and communication needs in communication with various entities, ranging from relatives and close acquaintances to government bodies. The population systematically utilizes electronic government platforms (egov.kz), where they have a personal account with all identification characteristics based on the Individual Identification Number, which consists of 12 digits.

The personal account displays and confirms, through legal documents, age, gender, education, marital status, family composition, place of work, occupation, registration by place of residence, movable property, means of transport, relationships with judicial authorities, tax payments, fines and other characteristics. All personal identifications have digital documentation (birth certificate, national identity card,

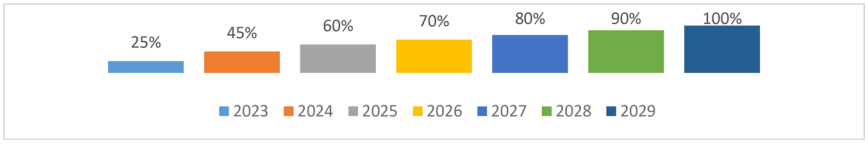


**Figure 5.** The dynamics of target indicators and expected results for delivering digital services to the population and businesses within 5 min analyzed.
Source: Data sourced from *'Development of Communications and Information-Communication Technologies in the Republic of Kazakhstan, 2017–2021',* Statistical Yearbook, Astana, 2022, available at stat.gov.kz and visualized by the authors.

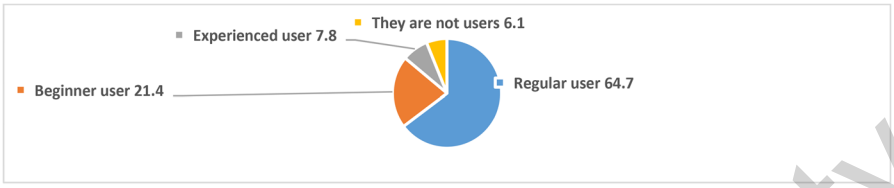


**Figure 6.** Digital skills and Internet usage among the population (% of total users).
Data visualized by the authors based on information from the Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan (2022).



international passport, driver's license, pension certificate, property documents). All identification data in the personal account, including the electronic digital signature, are linked to the mobile phone. This linkage provides access to remotely receive various documents regarding personal identification as an owner, citizen and taxpayer.

The egov.kz portal has 12 rubrics in total: family, healthcare, education, employment and occupation, social security, citizenship, migration and immigration, real estate, customs and taxes, legal assistance, transportation and communications, consular services, military registration and security. The portal operates in Kazakh and Russian languages, providing services to citizens and businesses.

It is evident that the government strives to move towards innovation and plans target development indicators. For example, the aim is to reduce the time for providing public services to the population and businesses on the egov.kz system from 25% in 2023 to 100% in 2029 (Figure 5**).**

The speed of service delivery depends not only on technological conditions established by the state but also on humanitarian contexts. These include users' skills, motivations and access to personal digitalization tools. An analysis of government statistical data revealed that the typology of users by levels of digital competence and skill structure indicates a predominance of basic consumers, a significant proportion of beginners and a small share of experienced users (Figure 6).

An analysis of respondents' answers (*Kazakhstan Society, N = 2000, 2024*) revealed that 54% rated their level of Internet proficiency as medium, 21% as high and 8% as very high. Meanwhile, 11% assessed their proficiency as low, 6% as very low and 2% do not use the Internet, citing no need for it.

The majority of users' skills do not exceed the software requirements of general preparation in secondary school in the subject of 'Informatics' (points 1–9, Table 2). Only 13.7% possess specialized professional skills for configuring software, making OS changes and using cybersecurity programs, while 7.4% can develop computer programs using specialized programming languages (points 10–11, Table 2).

The rapid development of digitalization has created a growing demand for educational programs. Different age groups have distinct priorities, determined by their status within the socio-professional structure and level of active engagement (Table 3).

Kazakhstan's society is characterized by its multiculturalism (approximately 130 ethnic groups), multireligious composition (18 denominations) and multilingualism. The largest ethnic groups include Kazakhs, Russians, Uzbeks, Ukrainians, Uyghurs, Germans, Tatars, Azerbaijanis, Koreans, Turks, Dungans, Belarusians, among others (Office of National Statistics, Agency for Strategic Planning and Reforms of the Republic of Kazakhstan, 2022). The Kazakh language is the state language, while Russian has the status of an official language for communication. The country has adopted a trilingualism policy, promoting proficiency in three languages: Kazakh (state), Russian and English. Russian was identified as the preferred language for Internet use among respondents of various ethnic backgrounds (Table 4).

**Table 2.** Structure of digital skills of the population overall (*Development of Communication and Information and Communication Technologies in the Republic of Kazakhstan 2017–2021*).

| No | The structure of digital skills of the population overall | % |
|---|---|---|
| 1. | Sending emails with attached files (document, photo, video) | 58.2 |
| 2. | Working in the Word text editor | 55.3 |
| 3. | Working in the Excel spreadsheet editor (using basic arithmetic formulas in tables) | 45.9 |
| 4. | Copying or moving a file or folder | 29.2 |
| 5. | Working in a graphics editor (including presentations, text, images, audio, video or diagrams) | 26.7 |
| 6. | Transfering files between computers and other devices | 23.2 |
| 7. | Finding, downloading and installing software | 20.0 |
| 8. | Connecting and installing new devices (printer, modem and others) | 19.1 |
| 9. | Using copy and paste tools to duplicate or relocate information within a document | 17.2 |
| 10. | Configuring software, including modifications to the operating system or security software programs | 13.7 |
| 11. | Developing computer programs using specialized programming languages | 7.4 |

Source: The data were derived by the authors from the Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan (2022).

**Table 3.** Distribution of respondents' answers to the question: 'What kind of Internet training, if any, do you need?' (Kazakhstan, $N = 2000$, %, 2024).

| | Respondent age | | | | |
|---|---|---|---|---|---|
| Type of training | 18–29 years | 30–39 years | 40–49 years | 50–59 years | 60+ years |
| Advanced user training for specialized programs | 34.4 | 28.1 | 27.8 | 27.2 | 13.5 |
| Basic user skills training | 10.2 | 14.0 | 24.1 | 22.0 | 25.0 |
| Training for using e-government services | 14.9 | 17.4 | 19.0 | 15.3 | 15.2 |
| None of the above is required | 44.2 | 44.8 | 35.7 | 43.2 | 51.8 |

Source: Sociological research '*Kazakhstani Society in the Context of Digital Transformation: Prospects and Risks*' (2024).

**Table 4.** Distribution of respondents' answers to the question: 'What language do you usually use on the internet?' (Kazakhstan, $N = 2000$, %, 2024).

| | Respondents' ethnic backgrounds (%) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Language used on the internet | Kazakhs | Russians | Germans | Tatars | Uzbeks | Uyghurs | Ukrainians | Other ethnic groups |
| Russian | 87.1 | 98.4 | 96.4 | 98.5 | 91.4 | 100.0 | 97.6 | 95.5 |
| Kazakh | 45.4 | 1.6 | 0.0 | 10.8 | 17.1 | 4.2 | 2.4 | 6.7 |
| English | 2.5 | 3.8 | 3.6 | 1.5 | 2.9 | 4.2 | 2.4 | 1.1 |

Source: Sociological research '*Kazakhstani Society in the Context of Digital Transformation: Prospects and Risks*' (2024).

Access to Internet-enabled devices is closely linked to household wealth levels. An analysis of survey data revealed a proportional relationship: the higher the household income, the greater the technological resources enabling digitalized lifestyles (Table 5).

### *3.4. Functional characteristics of internet usage by the population*

The trend line of Internet usage for information search and online services indicates that the most common functions among users are information-communicative (posting information or instant messaging) and search-informational (obtaining information about goods and services and searching for information related to healthcare services), followed by leisure and entertainment (downloading movies, images, music, watching videos, listening to music, gaming or downloading games). At the same time, the use of the Internet for education and self-education (reading or downloading online newspapers or magazines, electronic books), as well as digital literacy (downloading software or applications), lags behind significantly (Figure 7).

In total, 19.3% of users make purchases online. The structure of purchases indicates the satisfaction of demand (in descending order) for consumer goods (clothing, footwear, sports equipment, groceries, medications, cosmetics, books, newspapers and magazines, movies, music and lastly, computer software, video games and goods) (Figure 8).

**Table 5.** Distribution of respondents' answers to the question: 'What devices do you use to access the internet at home?' (Kazakhstan, *N* = 2000, %, 2024).

| | Devices used for internet access at home (%) | | | | | | |
|---|---|---|---|---|---|---|---|
| Household financial status | Mobile phone/ smartphone | Laptop/ netbook | Desktop computer | Internet TV | Tablet | Smartwatch | Smart home system |
| Insufficient funds even for food | 8.0 | 4.0 | 8.0 | 2.0 | 2.0 | 0 | 8.0 |
| Enough for food, but buying clothing causes significant challenges | 11.1 | 6.1 | 9.6 | 9.6 | 0.5 | 0.5 | 11.1 |
| Buying major household appliances would be difficult | 15.7 | 7.4 | 6.7 | 6.2 | 1.9 | 0.6 | 15.7 |
| Sufficient funds for major household appliances, but unable to afford a new car | 26.4 | 9.6 | 8.8 | 7.5 | 2.2 | 0.3 | 26.4 |
| Earnings are sufficient for everything except major purchases like a new apartment or house | 27.8 | 15.0 | 9.3 | 10.8 | 5.7 | 1.6 | 27.8 |
| No material difficulties, and could purchase an apartment if necessary | 34.7 | 16.8 | 17.9 | 11.6 | 6.3 | 2.1 | 34.7 |

Source: Sociological research '*Kazakhstani Society in the Context of Digital Transformation: Prospects and Risks*' (2024).

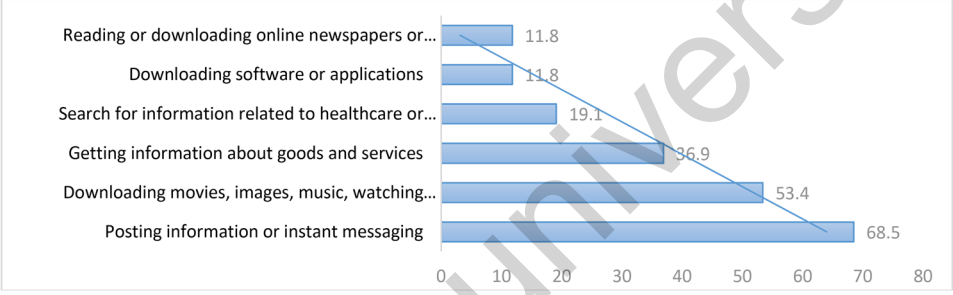


**Figure 7.** Using the Internet to search for information and online services.
Source: the data were extracted from the source Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan (2022) and visualized by the authors.


**Figure 8.** Distribution of users by types of goods ordered via the Internet.
Source: The data were extracted from the source Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan (2022) and visualized by the authors.



As of 1 March 2024, there are 75.5 million payment cards in circulation from international systems such as VISA International, MasterCard Worldwide, UnionPay International, American Express International and Diners Club International. Kazakhstani banks also issue cards from local systems: the local card of Citibank Kazakhstan – JSC 'Citibank Kazakhstan' and the Payment Card System Kaspi.kz – JSC 'Kaspi Bank'. In February 2024, transaction volumes using payment cards issued by Kazakhstani issuers amounted to 12.9 trillion tenge (the tenge-to-dollar exchange rate fluctuates and is approximately 470–500 tenge), with the number of transactions reaching 906.6 million (National Bank of Kazakhstan, 2024).

More than half of the users practice paying for goods and services with bank cards via the Internet, bank transfers are less common, every third person prefers mobile payments or pays in cash upon delivery of goods or services, and every fifth person makes advance payments for goods and services with a bank card (Figure 9).

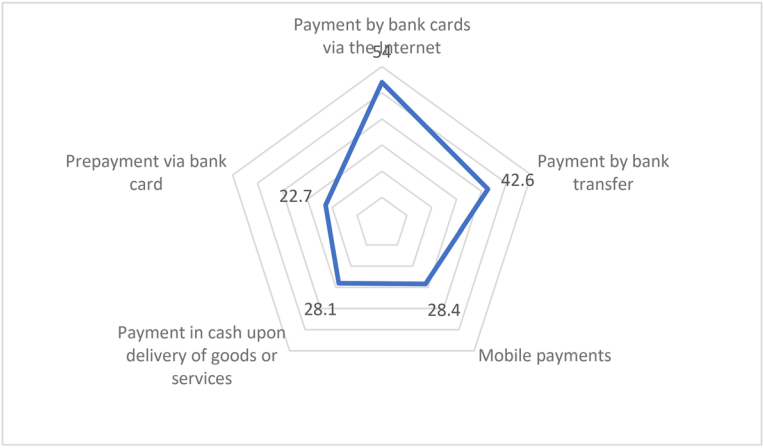


**Figure 9.** Distribution of users by types of payment for goods and services via the Internet.
Source: The data were extracted from the source Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan (2022) and visualized by the authors.

**Table 6.** Targeted Internet usage in households – descriptive statistics.

| Types of use of Internet technologies by the population | % |
|---|---|
| Sending and receiving email | 30.2 |
| Electronic government services | 26.7 |
| Access to chats, blogs, news and online discussions | 26.0 |
| Telephone conversations via the Internet/VoIP | 22.8 |
| Obtaining information from the website of government authorities | 22.3 |
| Purchasing or ordering goods or services | 18.7 |
| Education and training activities | 15.1 |
| Downloading official forms from the website of government authorities. | 13.3 |
| Selling goods or services | 12.4 |
| Electronic submission of completed forms to government websites | 11.4 |
| Utilization of official online courses | 6.0 |

Source: The data were extracted from the source Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan (2022) and visualized by the authors.



The development of e-commerce is experiencing significant growth (with 18.7% purchasing and 12.4% selling), which is convenient considering the unevenness of offline services and the large distances between settlements, as well as the employment of the working-age population (Table 6).

One of the innovations was the pilot project of the National Bank related to digital currency (the national currency tenge). It was launched in 2021, and the main motives for promoting this project are as follows:

- Citizens will be able to use it for offline transactions, without the need for Internet,
- The innovation does not pose a threat to the banking sector,
- Implementation should be seamless, with minimal costs,
- Digital currency is integrated into the existing payment infrastructure,
- Digital currency is a direct analog of cash,
- In the regular banking application of the client, a new icon will appear – 'digital wallet', where money from a card or deposit can be converted.

The use of digital tenge with real consumers has not yet been implemented, although it was envisaged that by the autumn of 2023, part of the benefits and pensions would be credited to the digital wallets of certain citizens, and part of the state purchases would be made using digital currency (Kuchma, 2024).

### *3.5. Assessment of digitalization and risks by the population*

The sociological survey revealed that 95% of respondents use the Internet for communication (audio and video calls), 92% for information searches and leisure activities, 91% for accessing social networks and 88% for conducting financial transactions.

**Table 7.** Distribution of respondents' answers to the question: 'Have you experienced discrimination or hostility online, and what were the motives?' (Kazakhstan…, *N* = 2000, %, 2024).

| | Respondents' ethnic background | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Factors of discrimination | Kazakhs | Russians | Germans | Tatars | Uzbeks | Uyghurs | Ukrainians | Other ethnicities |
| Experienced discrimination or hostility online | 13.7 | 24.8 | 39.3 | 21.5 | 20,0 | 16.7 | 26.8 | 19.1 |
| Did not experience discrimination or hostility online | 84.3 | 73.9 | 57.1 | 78,5 | 74.3 | 83.3 | 73.2 | 78.7 |
| *Motive* | | | | | | | | |
| Ethnicity | 7.2 | 15.3 | 32.1 | 15.4 | 11.4 | 12.5 | 22.0 | 11.2 |
| Religious beliefs | 4.7 | 8.0 | 14.3 | 7.7 | 5.7 | 0 | 4.9 | 1,1 |
| Political views | 3.9 | 5.4 | 21.4 | 6.2 | 5.7 | 8.3 | 2.4 | 6.7 |
| Social status | 1.6 | 2.2 | 3.6 | 4.6 | 2.9 | 0 | 0 | 2,3 |
| Gender | 1.3 | 1.9 | 3.6 | 4.6 | 2.9 | 0 | 2.4 | 1.1 |
| Sexual orientation | 0.8 | 1.9 | 3.6 | 4.6 | 0 | 0 | 2.4 | 1.1 |

Source: Sociological research '*Kazakhstani Society in the Context of Digital Transformation: Prospects and Risks*' (2024).

Digital technologies have enhanced interactions between ordinary users and government agencies. A total of 72% of respondents use electronic digital signatures to access online government services, pay taxes and fees and request information from government bodies (70%). The population noted several positive changes, including reduced time for budget payments (73%) and improved accessibility of government services (69%). However, every second respondent did not perceive improvements in the protection and security of personal data, in reducing corruption risks and abuses, or in simplifying interactions with government agencies (49%). Similarly, 48% did not notice improvements in the quality of medical services provided through the online portal. Respondents agreed that digitalization allows the population to monitor the activities of government agencies (39%) and expressed trust in e-government, believing it reflects the effective functioning of government institutions (43%). Nonetheless, half of the respondents remained skeptical about advancements in personal data security, the reduction of corruption risks and simplified communication procedures with government bodies (49%), as well as improvements in medical services offered via the *eGov* portal (48%).

According to 98% of respondents, the spread of digital technologies raises specific concerns, including hacking, cybercrime, data breaches (71%), the dissemination of false information, cyberbullying and fake content generated by artificial intelligence.

The majority of respondents (80%) reported not experiencing any difficulties or problems related to the adoption of digital technologies in Kazakhstani society. However, one in five (20%) encountered negative experiences, which were primarily attributed to insufficient awareness of modern digital technologies (39%) and the absence of an effective communication channel between respondents as service consumers and service providers (38%).

The primary measures in digitalization that respondents deemed necessary include reducing the cost of Internet services for the population (73%) and ensuring Internet accessibility in all regions (65%). Among the proposed services requiring improvement, development, and introduction, 57% of respondents highlighted the need for simple training programs for information searching in Kazakh.

Regarding the impact of digitalization, 61% of respondents remained undecided. Meanwhile, 28% embraced the paradigm that digitalization promotes progressive and harmonious societal development in Kazakhstan, whereas 11% believed that it introduces uncertainty and risks.

Although 81% of respondents stated that they had not encountered discrimination or hostility online, 17% indicated they had such experiences. The nature of discriminatory experiences appears to vary based on the respondents' ethnic backgrounds (Table 7).

An analysis of the general public's attitudes toward the process of digitalization revealed that while the technologization of life fosters societal and personal progress, it also gives rise to new socio-humanitarian challenges.

**Table 8.** Expert assessment of digitalization's impact in various economic sectors ($N = 102$, as a percentage of respondents; verified by the authors based on the findings of the study 'Kazakhstan…, 2024).

| Economic sectors | Degree of digitalization influence | | |
|---|---|---|---|
| | High degree (%) | Moderate degree (%) | Low degree (%) |
| Communication and telecommunications | 82.4 | 13,7 | 3,9 |
| Public services | 80.4 | 15.7 | 3.9 |
| Corporate business | 71.6 | 27.5 | 1 |
| Healthcare | 69.6 | 19.6 | 10.8 |
| Academic environment | 67.7 | 22.6 | 9.8 |
| Production (labor productivity growth, automation and robotics) | 63.7 | 29.4 | 6.9 |
| Education | 61.8 | 32.4 | 5.9 |
| International cooperation and partnerships | 61.8 | 27.5 | 10.8 |
| Small and medium enterprises | 56.9 | 33.3 | 9.8 |
| Strategic breakthrough to global leadership | 55.9 | 29.4 | 14.7 |
| Public administration (enhancing efficiency and social orientation) | 53.9 | 42.2 | 3.9 |
| Public sector economy | 52.9 | 39.2 | 7.8 |
| Human interaction (creating a comfortable living environment) | 44.1 | 41.2 | 14.7 |
| Agricultural sector | 37.3 | 35.3 | 27.5 |
| Promotion of national values and achieving cultural-civilizational identity | 30.4 | 39.2 | 30.4 |
| Strengthening unity and social consolidation | 19.6 | 43.1 | 37.3 |
| Political parties and movements | 19.6 | 41.2 | 39.2 |
| Humanitarianization of social relations and strengthening moral foundations of life | 14.7 | 46.1 | 39.2 |

Source: Sociological research '*Kazakhstani Society in the Context of Digital Transformation: Prospects and Risks*' (2024).

### *3.6. Expert discourses on digitalization in Kazakhstan society*

In the sociological study (Institute of Philosophy, Political Science and Religious Studies, Committee of Science, Ministry of Science and Higher Education of the Republic of Kazakhstan, 2024), varying degrees of digitalization's impact across economic sectors were identified. Expert evaluations revealed an uneven digitalization process, not only between the productive (economic) and non-productive (social, political and humanitarian) spheres but also within these domains (Table 8).

Given the insufficient level of digitalization across different economic sectors (Table 8) the government's expectations of improving its Global Innovation Index ranking (Figure 3) appear overly optimistic.

Experts were asked to respond to the open-ended question: '*Identify the key problem areas and the most pressing tasks that require the government's and society's immediate attention in relation to digitalization processes in Kazakhstan*'. This inquiry resulted in a dataset of 214 statements. These were ranked through content analysis into 12 key issues, listed from the most significant (No. 1) to the least frequently mentioned (No. 12) (Table 9).

When comparing Kazakhstan's position in the global digitalization landscape with other countries, 64% of experts place it midway between the center and the periphery, while 21% believe that Kazakhstan currently remains at the periphery.

According to experts, three primary barriers hinder the development of digitalization:

1. Shortage of specialists with the required qualifications (88%),
2. A weak market for digital solutions and a limited number of IT professionals (82%),
3. Cybersecurity challenges (78%).

The least significant obstacles negatively affecting digitalization were identified as psychological, cultural and social biases among the population (32%).

Experts were asked to provide formalized opinions on the impact of digital technologies in Kazakh society, selecting from two modalities: 'agree' or 'disagree'. The distribution of evaluative judgments revealed clear demarcations regarding the humanitarian consequences of digitalization. (Table 10).

According to the experts, the positive aspects of digitalization are as follows:

- Possessing advanced digital knowledge and skills is increasingly important and necessary to remain competitive in professional environments (97%);

**Table 9.** Expert discourse on digitalization challenges (compiled by the authors based on the findings of the study 'Kazakhstan…, *N* = 102, 2024').

| No | Key issue | Expert recommendations for addressing the issue |
|---|---|---|
| 1 | Cybersecurity, data protection, personal data leaks online fraud | Strengthen the security of personal data, ensure the protection of rights and digital assets and safeguard personal profiles in the digital environment. |
| 2 | Digital literacy education for the general population and specific groups (children, the elderly, youth, officials) | Generations should support one another: children and teenagers should help 'dinosaurs' (the older generation) master digital technologies and tools, while the older generation should focus on fostering systematic thinking and informed decision-making among youth. Media literacy, critical thinking and basic cybersecurity principles should be taught with state support, starting in schools. Educational programs on computer science must align with users' real needs. |
| 3 | Equal access to the Internet and digitalization opportunities | Eliminate disparities in access between rural and urban areas. Expand service provision in the Kazakh language. |
| 4 | Enhancing digitalization in government institutions | Increase the number of government services available through the e-gov system, improve e-gov services, ensure transparency in public procurement tenders and competitions and enhance the transparency of the judicial system and court operations. |
| 5 | Inadequate legal framework for digitalization in Kazakhstan | Establish comprehensive legal regulation of digitalization processes. |
| 6 | Accelerating digitalization in education, healthcare, the judicial system and business | Foster interdisciplinary connections in education that integrate digital and non-digital specializations. Simplify access to medical services via electronic portals. Digitalize the legal field, including legislative and legal advocacy processes. |
| 7 | Negative influences on youth and the population as a whole (online violence, pornography, drug distribution, cyberbullying, etc.) | Monitor Internet content and implement government regulations. Promote moral resilience based on traditions and tolerant interethnic relationships. |
| 8 | Insufficient number of qualified specialists | Allocate more scholarships for IT specialist training at both Kazakhstani and international institutions in countries with advanced cybersecurity and digitalization systems. |
| 9 | Infrastructure challenges for digitalization (Internet speed, servers, equipment, data transmission errors, etc.) | Expand computing capacity for existing and operational digital services (especially government and public portals). Develop Internet of Things technologies, telecommunications and the production of electronic products and chips. |
| 10 | Risks of total state control or 'Big Brother' | The state should not use the Internet to manipulate public opinion. Overregulation linked to political regimes hinders digitalization. A well-thought-out security policy is needed, as some unfriendly countries may introduce harmful algorithms or impose hostile trends under the guise of promoting digital technologies. |
| 11 | Digitalization market, competition and the state's role | Effective digitalization development requires many players in the field. A high state share in the digital economy stifles competition. The state should create a conducive environment, provide conditions and incentivize the development of digital products. |
| 12 | Digitalization to reduce the role of the human factor | New solutions are needed to replace human labor with digital technologies where appropriate. |

Source: Sociological research '*Kazakhstani Society in the Context of Digital Transformation: Prospects and Risks*' (2024).

- The virtual environment positively influences how different ethnic groups interact both within their own communities and with others in society (82%);
- People are learning to integrate into society and fulfill their civic responsibilities (79%).

Experts also identified significant negative consequences:

- Real-life experiences are increasingly being replaced by virtual ones, with the growing dominance of social media (72%);
- The virtual environment strongly influences individuals' views and beliefs, whether religious or secular (66%);
- A substantial portion of interpersonal communication has shifted to virtual platforms (57%);
- Information technologies and tools are being used to exert targeted influence on sovereignty (55%);
- Bloggers and opinion leaders are gaining increased influence over public consciousness (54%);
- Authorities struggle to regulate content published on social media (54%);
- There is a growing trend for individuals to publicly showcase their private lives on social networks (51%).

Additionally, 65% of experts identified the primary threat of digitalization as the potential for destructive impacts on the population.

**Table 10.** Expert evaluation of the effectiveness of digital technologies on society (verified by the authors based on the findings of the study 'Kazakhstan…, *N* = 102, %, 2024').

| | Agreement modality | |
|---|---|---|
| Evaluative judgments on digital technologies | 'Agree' (%) | 'Disagree' (%) |
| Facilitate technological advancement and improve living standards | 98.0 | 2.0 |
| Contribute to the harmonious development of individuals and expand opportunities for self-realization | 94.1 | 5.9 |
| Promote equality in the digital and networked environment | 81.4 | 18.6 |
| Create new risks for political governance | 72.5 | 27.5 |
| Enhance the quality of life and its longevity for the entire population | 65.7 | 34.3 |
| Lead to the emergence of new social and humanitarian issues | 58.8 | 40.3 |
| Result in interpersonal relationships becoming less humane | 50.0 | 50.0 |
| Increase social inequality in real life | 43.1 | 56.9 |
| Reduce society's and individuals' ability to care for and assist one another | 34.4 | 65.6 |
| Improve life only for the wealthy segments of the population | 13.7 | 86.3 |

Source: Sociological research '*Kazakhstani Society in the Context of Digital Transformation: Prospects and Risks*' (2024).

The interaction between citizens and the state has demonstrated several positive outcomes resulting from the implementation of digital technologies. Notable improvements include the enhanced quality of public services for both citizens and businesses (93%), the optimization of processes for tax and fee payments (91%) and the streamlining of systems for submitting electronic complaints and inquiries to state agencies (79%).

While digitalization has provided tools for submitting applications and signing petitions, it has not significantly improved the protection of citizens' rights, as the responsiveness to public opinions remains low (24%).

However, digitalization has also introduced significant risks for the population. The primary concerns identified are cyber fraud (87%), data breaches (73%) and a lack of transparency in the use of personal data (65%). These risks highlight the challenges associated with integrating digital technologies into governance and underscore the need for effective mitigation strategies.

## 4. Discussion

The scientific discourse on digitalization integrates diverse disciplinary and methodological approaches and is represented by theories and concepts that illuminate the technological, humanitarian, and political contexts of this complex process. The subjects of the digital civilization include states, societies, corporations, enterprises, social groups, households and individuals. Digitalization categorizes societies based on their levels of technological development into advanced, peripheral and those lagging behind the horizon of progress.

The theory and practice of the digital society draw attention to the fact that rapidly evolving digital technologies bring about changes in society and require adaptation from individuals, organizations and governments. Understanding and promoting the digital society involve several dimensions that explore and document not only technological capabilities but also social and humanitarian changes in society under the influence of digital technologies and the Internet. Therefore, it is appropriate to consider and investigate the technical and humanitarian projections of digitization in their sociotechnical, sociotechnological, socio-humanitarian, cultural-historical synthesis (Figure 10).

The application of the outlined theoretical approaches to the study of digitalization facilitated the verification of hypotheses. An examination of the general discourse on digitalization within the expert community confirmed hypothesis (a) regarding the latent potential of the humanitarian dimension of digitalization. The development of a methodology for specific sociological research, incorporating proposed classifications of levels of digital inequality (Bentley et al., 2024), enabled an investigation into factors of structural access, digital engagement, skills and levels of 'digital confidence'.

A synchrony was observed between assessments of the state and level of digitalization by international and Kazakhstani experts on one hand, and overly optimistic projections regarding the pace of digitalization in government programs on the other. This perspective aligns with the views of colleagues who assert that, despite the adoption of relevant programs and initiatives by the state, the pace of implementing digital technologies remains slow. This is attributed to factors such as insufficient funding,

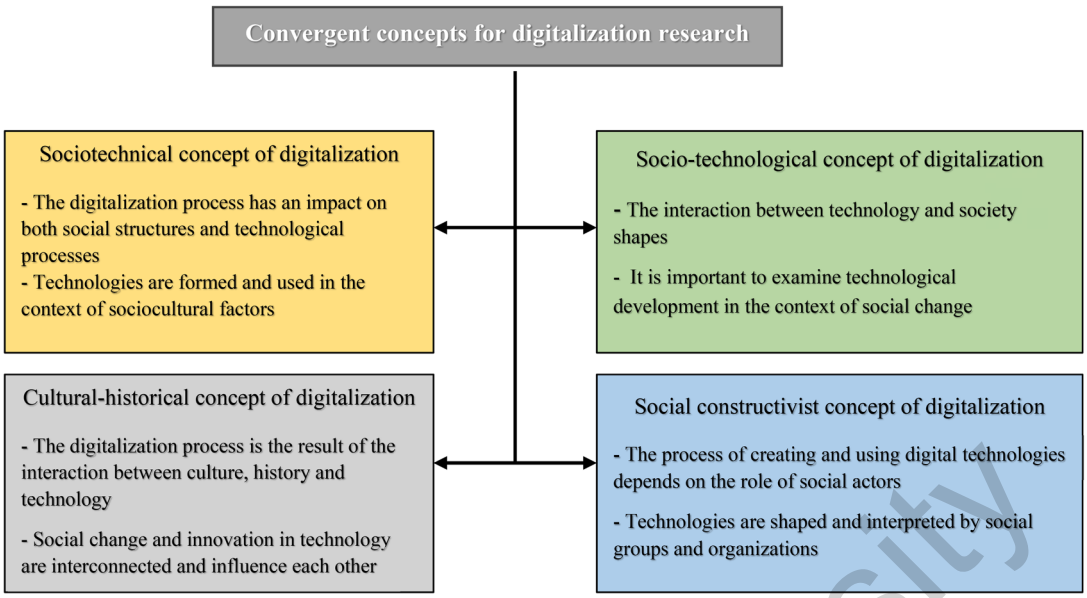


**Figure 10.** Synthesis of technocratic and socio-humanitarian approaches in understanding the digital society.
The conceptualization and schematization were conducted by the authors based on a theoretical reconstruction of scholarly approaches.

a shortage of qualified personnel, weak digital infrastructure in remote regions and resistance from traditional industries and enterprises unwilling to alter established business models (Amrebayev & Zhandosova, 2024).

Digitalization in Kazakhstan covers various spheres of activity to different extents, and the level of development of the digital society can be assessed within the range of average to below-average values. To answer the question 'Can Kazakhstan achieve competitiveness in the conditions of the new global technological order, moving from occupied positions of digital readiness along an upward trajectory?' it is necessary to continue monitoring comparative studies in accordance with international standards.

Hypothesis (b), which posits that digital inequality is reproduced in various spheres – both technological and humanitarian, and within each of them – was corroborated through expert evaluations. Trends indicate that the influence of digitalization is less pronounced in social, political and humanitarian interactions compared to areas such as communication and connectivity, customer service, corporate business, public administration, medicine, science and education. The agricultural sector remains among the least impacted (Table 8). These trends suggest a dominance of the technocratic approach in implementing state digitalization programs, often at the expense of the human dimension.

Hypothesis (c), which suggests that users possess varying levels of digital competencies, skills, and needs, and that generational, socio-professional, educational and other identity-related disparities exist, was fully confirmed only in relation to the financial status of households. The findings reveal that lower-income households face fewer opportunities and resources to develop a digital infrastructure for family life. This issue is problematic not only in terms of access to ICT but also in relation to personal development. Our results align with the perspective that accurate and representative data on the use of digital technologies across income groups can link income inequality to digital inequality. Such insights could aid in developing economic mechanisms to reduce gaps in key areas of digital inequality, mitigate its consequences and provide targeted support to the most vulnerable segments of the population (Jopling et al., 2025).

At the same time, an analysis of the results of a population-wide survey revealed that:

- There are no significant differences in digital inequality concerning access to ICT across various social strata (gender, age, ethnicity, education, socio-professional or religious groups).
- Minor differences in digital inequality are associated with the age characteristics of younger (up to 35–39 years), middle-aged (40–50+ years) and older (60+ years) generations. These differences are related to their engagement with contemporary technological lifestyles, professional statuses and recognition of digitalization as a need, goal and value.

**Table 11.** Principles of the state in digital transformation policy.

| | |
|---|---|
| Human-centricity | Improving the quality of human life.<br>Transition to the provision of public services through mobile devices (smartphones, tablets).<br>Services and transformation are focused on human needs and overcoming problems. |
| Results focus (impact-oriented) | Focus on results through systemic change.<br>Transformation via using the power of digital technologies. |
| Transparency | Transparency of the activities of government bodies and their processes.<br>Digital tools for direct communication between citizens and the state.<br>Possibility of joint decision-making with the general public. |
| Service approach | The government views quality service as an inherent value.<br>Citizens and businesses have the opportunity to evaluate the work of government bodies through digital tools. |
| Availability | Users receive freely accessible information.<br>Each person can receive services: buying tickets, banking services, paying utility bills, making appointments with doctors, etc. |
| Flexibility | Studying trends and progress toward achieving objectives.<br>Adjustment depending on the challenges and priorities of socio-economic development. |
| Pragmatism | Elimination of reproduction and duplication of information systems. |
| Confidence | Protection of privacy and personal data.<br>Digital security monitoring. |
| Confidentiality | Access to information is permitted exclusively to legally authorized subjects: clients, platforms (programs), processes. |
| Integrity | Guarantee of information stability in case of intentional (unintentional) transformation or destruction of certain data. |

Source: The concepts were explicated by the authors from the report Government of the Republic of Kazakhstan (2023).

- Compared to other age cohorts, younger individuals are almost unaware of such risks of digitalization as substituting real identity with virtual identity, loss of traditional communication culture and value shifts.
- The level of digital confidence across all strata is assessed as moderately critical, with every second respondent expressing a desire to improve their digital competencies. Hypothesis (d), which posited that the expert community lacks consensus regarding the achieved level of digitalization, risk assessments and its consequences, was largely confirmed. Opinions are polarized concerning the humanitarian consequences, the emergence of new humanitarian issues and the relationship between digital inequality and inequality in real life. Experts demonstrated significant differences in assessing the risks associated with political governance and the loss of traditional moral qualities such as care and mutual assistance. However, there is convergence among experts on two dimensions, interpreted solely as positive projections: digital technologies contribute to raising living standards, fostering harmonious human development and expanding opportunities for self-realization (Table 10).

Hypothesis (e), which suggested that dimensions of digital development highlight areas of social, technological, humanitarian and political contradictions and require the development and implementation of governmental approaches to address them, was confirmed in both public perceptions and expert discourses (Table 9).

Multidisciplinarity of the digital process implies interconnectedness with ecological, economic, and social sustainability, but it is not yet entirely clear which dimension dominates. It is entirely justified to question how responsible entities (politicians and managers) perceive social issues in connection with the imperative of the progressing influence of digitization. In studying these questions, a multimethodological approach is proposed, combining the resources of different disciplines and theories (Brenner & Hartl, 2021).

In the perspective of the global discourse, the result of society's self-identification in the digital paradigm clarifies the country's development predetermination and helps to form a reasoned choice of methodologies and strategies for integration into the new world order. The approach of the Kazakhstani government is linked to the optimal solution of urgent issues in providing public services to the population and the business community, with the transformation of public administration and further development of economic sectors using the opportunities of digital technologies.

The policy of digitization coincides with the recommendations of scientists and focuses on human-centricity. Kazakhstan, as a member of the UN, shares and applies the principles of the Geneva Declaration (WSIS Executive Secretariat, 2003), and formulates based on them its vision of the state's obligations during the digitization of society (Table 11). These principles indicate the application of an

integrated approach to the development of the digital society, where not only technical goals and possibilities are considered, but there is also their close integration with the humanitarian rights of individuals.

The digitization in the context of Kazakhstan poses dilemmas and contradictions between technological advancement, innovation and humanitarian aspects:

1. Digital technologies are available to the population and businesses, yet the population lacks the knowledge and technological resources to use them universally and without restrictions. Digital divide necessitates additional efforts from the state in educating the mass consumer and training IT specialists. These approaches can mitigate the digital divide.
2. With the development of digital technologies, the threat of privacy breaches and leakage of confidential data increases. Ensuring privacy and security of users requires educational and informational campaigns among the population on one hand, and continuous improvement of information security technologies on the other.
3. Digitization alters the labor market demand and requires new skills and knowledge from workers and students. While the pace of technological development does not currently pose an immediate threat of replacing humans with artificial intelligence functions, special technological training is needed to address the risks of algorithmic discrimination, as well as changes in labor motivation. Finding a balance of interests is crucial.
4. With the advancement of digitization, there is an increasing need for effective regulation and control by the state. The government must strike a balance between protecting the rights and interests of citizens and stimulating innovation and digital development.

The potential adaptability of the educated Kazakh population to changes on one hand, and the unevenness of digital development on the other, create objective conditions for the reproduction of internal digital inequality within the country, and also restrain the overall intensity of digital society development and do not fully contribute to the pace of achieving target indicators (Figure 11). Disparities in digital development in Kazakhstan generate both internal and external risks. Overcoming them requires a systematic digitalization policy.

In the political dimension, Kazakhstan, as a central state of the Eurasian continent, is at the center of the interests of leading geopolitical actors, technologically advanced countries, and enclaves of states. For Kazakhstan, digitization has become a condition, a principle and an approach in the situation of catching-up modernization, leading to the necessity of choosing a paradigm, scientifically theoretical understanding of the process, practical development, adoption and implementation of state policy.

## 5. Conclusion

Starting from the second third of the past century, the technocratic vector of development in connection with informatization has become a reality, which predetermines the meaning of civilization development and leaves no alternative choice for innovative changes. They lead not only to the expansion of technological capabilities but also to significant transformations of human beings and society because they alter values, mentality, lifestyle, formats of familiar communication and compel action in two worlds: the real and the virtual.

Humans are compelled to undergo a new digital identification, becoming digital personalities from birth. Formats of digital identification become markers of progress not only for states but also for the competitiveness of individuals as subjects of social action. They create both opportunities for adaptation in the new technological environment and risks of ending up on its periphery.

The classification and indexing of states in the structure of global digital (technological) readiness according to commonly accepted criteria and standards contribute to a critical assessment of innovative transformations and allow for the identification not only of a place in the hierarchy but also an understanding of the peculiarities of digital society development, providing an assessment of institutional effectiveness.

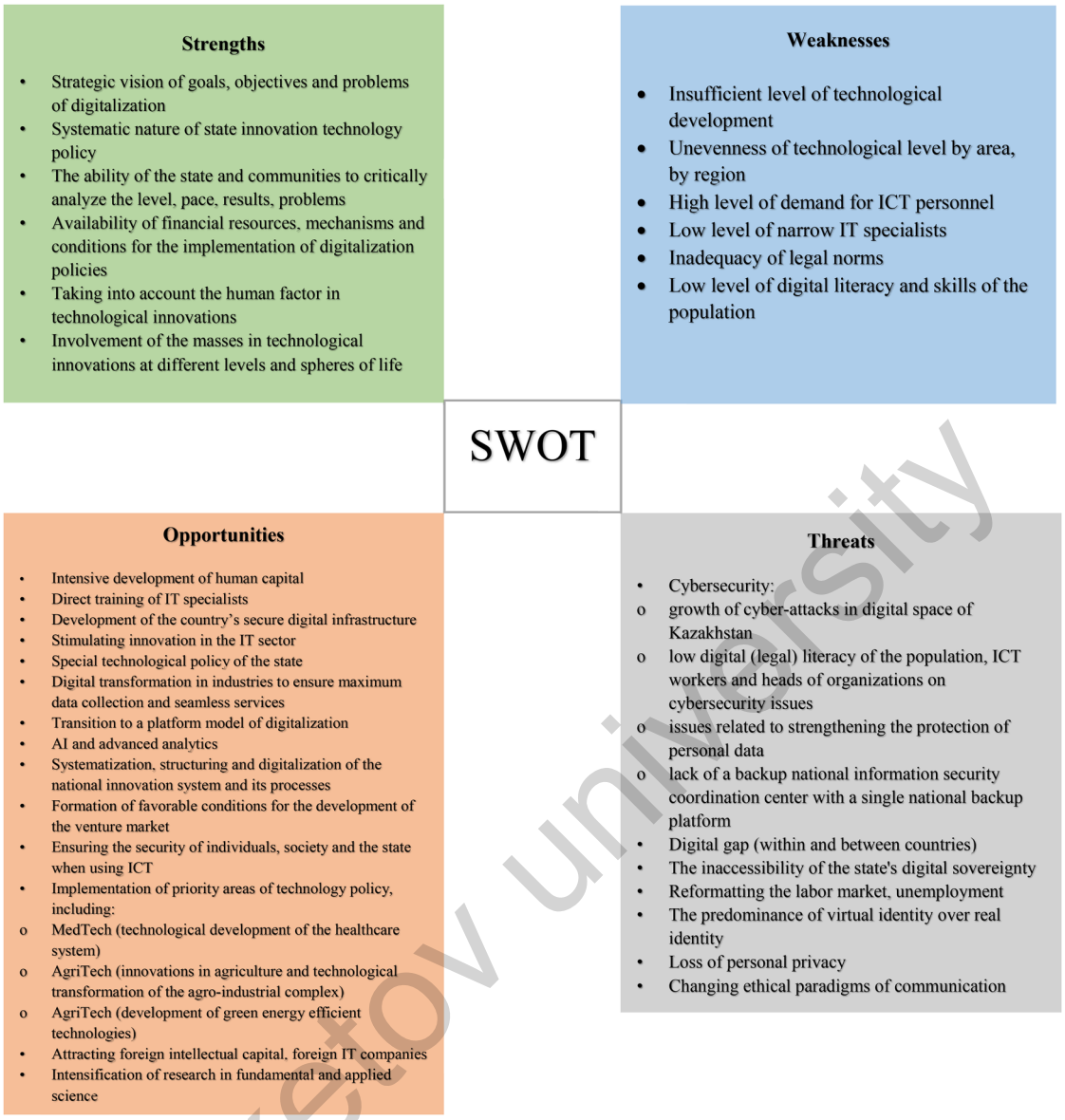


**Figure 11.** SWOT Analysis of the development of Kazakhstan's digital potential.
SWOT analysis was conducted by the authors based on the research findings.



In the perspective of global discourse, the result of self-identification of society in the digital paradigm clarifies the predetermined development of the country and helps formulate a reasoned choice of methodologies and strategies for integration into the new world order.

In the projection of personal development, self-identification in the digital space of life improves qualities, expands opportunities, and demonstrates integral characteristics of humans as subjects surpassing their technological characteristics and images.

The purpose of philosophy in the global digital reality lies in its ability to overcome the dilemma of technocratic and socio-humanitarian approaches in understanding the vectors of societal development, in the classification of capable statehood, in the retention, reproduction, and multiplication of unique human identity.

## Authors' contribution

Methodology, conceptualization, Sh.J., E.B.; investigation, Sh.J., E.B., A.S.; writing – original draft preparation, E.B.; writing – review and editing, Sh.J., E.B.; a sociological interpretation, Sh.J.; formal analysis, project administration, A.S.;

date curation, supervision, D.Zh; visualization, text translation, link design, A.A. All authors have read and agreed to the published version of the manuscript.

## Disclosure statement

The authors declare that they have no competing interests.

## Transparency

The authors state that the manuscript is honest, truthful and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.

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## Data availability statement

All data extracted and analyzed during this study are openly available in the following sources:

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The data from the sociological research *'Kazakhstani Society in the Context of Digital Transformation: Prospects and Risks' (2024)* are subject to third-party restrictions.

Data supporting the findings of this study are available upon request from the Institute of Philosophy, Political Science, and Religious Studies. Access to these data is subject to restrictions, as they were utilized under license for this research. Requests for data can be sent to mailto:Office@iph.kz, with permission required from the Science Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan.

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