WOMEN AND DIGITALIZATION
IN THE PUBLIC SECTOR

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ABSTRACT

The public sector in Kazakhstan is actively integrating digital tools to enhance the management of various spheres. This integration aims to streamline processes for citizens, improve feedback mechanisms, and reduce costs. Given the predominance of men in top management positions, this article proposes to examine the contributions of women managers in Kazakhstan to the development of public sector digitalization. Through an analysis of case studies involving the implementation of digital tools in education, finance, information technology, and local government, this article explores the role of women managers in this transformation. The findings suggest that women actively and successfully implement innovative projects, develop citizen-centric products, and foster a new digital culture within the public sector. Despite their relatively low representation at decision-making levels, women effectively leverage management resources and contribute significantly to the advancement of new technologies.

Keywords: *Case Studies, Citizen-Centric Products, Digitalisation, Public Administration,*

Public Service Delivery, *Women.*

INTRODUCTION

The rapid digital transformation of the XXI century has redefined governance, public services, and social participation across the globe. Women are not only active participants but increasingly serve as key agents of innovation in this shift. Their engagement in areas such as artificial intelligence, e-governance, and digital service delivery has introduced more inclusive and human-centered approaches to public sector reform (Kireyeva et al., 2024). Numerous studies emphasize that women's leadership in digital transformation brings attention to equity, accessibility, and the diverse needs of society (Ziyadin et al., 2019).

In Kazakhstan, several initiatives underscore the growing presence of women in digital innovation. Notably, the #SheInnovator program and UNDP-led digital inclusion efforts have trained thousands of women in digital technologies, artificial intelligence, and data-driven governance[3]. These initiatives aim to close the gender gap in digital skills and promote women's

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[3] Accelerating women's digital inclusion through experimentation in Kazakhstan | United Nations Development Programme. (n.d.). Retrieved January 3, 2025. Available at: https://www.undp.org/kazakhstan/blog/accelerating-womens-digital-inclusion-through-experimentation-kazakhstan

leadership in public administration, especially in socially impactful domains such as education, healthcare, and service delivery.

Despite this momentum, gender disparities persist. Women remain underrepresented in strategic roles within the public technology sector, where systemic barriers, such as unequal access to leadership positions and prevailing stereotypes about women in STEM, limit their advancement (Kogabayev & Banerjee, 2024). Overcoming these barriers is not only a matter of social justice but also a strategic imperative for innovation, as countries that leverage the full potential of both men and women tend to achieve more sustainable and resilient digital governance outcomes (Pasenko, 2022).

This article examines international and national best practices that facilitate women's integration into digital governance systems. By highlighting successful examples from Kazakhstan and beyond, it explores how female leaders contribute to inclusive, efficient, and citizen-centric digital transformation in the public sector.

INTERNATIONAL EXPERIENCE

Global trends increasingly show that women's leadership is a critical driver of effective digital governance. Across a variety of countries, women leaders are spearheading initiatives in e-government, digital services, and citizen engagement platforms. Their approaches often prioritize transparency, social inclusion, and responsive public service design (UN Women, 2019; OECD, 2022).

In Estonia, President Kersti Kaljulaid played a pivotal role in promoting the nation's digital transformation. Under her leadership, Estonia advanced its e-governance model, including pioneering services such as e-Residency and X-Road, which now serve as global benchmarks in public sector digital infrastructure.[4] These platforms enabled efficient cross-border digital services and increased administrative transparency, while embodying values of openness and accessibility.

Singapore provides another example where gender-inclusive digital governance is embedded in national policy. Through the Tripartite Alliance for Fair and Progressive Employment Practices (TAFEP), launched in 2006, the country addressed systemic gender and diversity gaps in digital and public sector leadership. These efforts have fostered an inclusive labor environment and encouraged more women to enter and lead in technology-intensive fields.

In Denmark, women have contributed significantly to the development of the «Digital Post» system, which requires citizens to receive official communication from government agencies electronically. With access via NemID and MitID digital identification systems, this innovation has streamlined communication, enhanced data security, and improved public service accessibility (Pasenko, 2022).

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[4] President Kaljulaid: the impact of Estonias digital story. (n.d.). Retrieved May 3, 2025, from https://e-estonia.com/president-kersti-kaljulaid-tracing-the-real-world-impact-of-estonias-digital-story/

In France, the Femmes du Numérique program supports women's participation in digital public innovation. Through this initiative, women are directly engaged in designing and implementing solutions involving artificial intelligence, smart public services, and digital access equity. These programs are supported by both public institutions and private tech-sector stakeholders, reflecting a comprehensive approach to female inclusion in digital transformation efforts (UN Women, 2019).

Overall, international experience confirms that women play an essential role not only in technical implementation but also in shaping the values and directions of digital governance. Countries that actively promote gender equality in technology and public administration benefit from more inclusive, sustainable, and effective service delivery models (Kogabayev & Banerjee, 2024).

METHODS AND MATERIALS

This study employed a secondary analysis of over 50 scholarly publications and reports concerning digitalization and gender equality in Kazakhstan and beyond. Additionally, official policy documents were reviewed. Subsequently, biographical research was conducted on female leaders, and concise case studies were compiled, focusing on women in leadership positions who have spearheaded the implementation of digital tools within the public administration system.

To conduct a more in-depth analysis, we selected number of digitalization cases implemented under the leadership of women in civil service[5]. Three criteria were used for selection: (1) a woman in a top managerial or decision-making position; (2) a completed project; and (3) a project with a social impact. We identified 20 digitalisation cases carried out under the leadership of women (either as top manager or deputy top managers) at both the central and regional levels of public administration. From these 20 cases, five were selected that most accurately met the above-mentioned criteria's.

CASES

Case 1: Digitalization of information policy and citizen feedback systems.

- Open Dialogue Platform: This platform processed over 120,000 citizen requests, with 87% receiving positive resolutions;

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[5] In Kazakhstan women constitute 55.8% of the civil servants, a proportion that has remained stable. Within this group, 39.1% hold management positions, with the majority occupying mid-level management and executive roles. At this time, three out of 21 ministries are headed by women: the Ministry of Health, the Ministry of Labor and Social Protection of the Population, and the Ministry of Culture and Information. Additionally, eight women serve as vice-ministers, and three as heads of staff. Six women hold leadership positions in the 14 government bodies that directly report to the President of the Republic of Kazakhstan. (ortcom.kz, 2025). Notably, the head of the National Center for Human Rights and the chairperson of the Constitutional Court of the Republic of Kazakhstan are women. The judiciary also reflects female representation, with 1,248 women judges, accounting for 53% of the total. However, the representation of women in the Parliament of the Republic of Kazakhstan is lower, with 2.8 women deputies, representing 1.89% of the total number of deputies.

- Center for Analysis and Monitoring of Social Media: The center processes up to 500,000 messages daily, reducing government agency response time to critical publications from 3-5 days to 24 hours;
- "Media School" Program for regional journalists: Over 2,000 specialists completed the program, resulting in improved quality of regional media;
- Disinformation Monitoring System: This system prevented the spread of over 3,000 instances of fake news in 2022-2023;
- "Unified Electronic Archive of Documents" Information System: 1,591 organizations are connected to this system. In 2024, the system was modernized and expanded with 103 additional points. Plans for 2025 include the transfer of electronic documents to state and local executive bodies for state storage.

Digitalization holds immense promise for the cultural sector, expanding access to the Kazakh people's heritage. The planned "E-museum" portal, a virtual network of Kazakh museums, will leverage visual and interactive technologies, including 3D models, to facilitate immersive cultural exploration.

Case 2: Development of digital government services and GovTech

Completed digitalization projects:

Astana International Financial Center (AIFC):

- Implemented the "Digital Financial Hub" concept.
- Launched the online platforms of e-Residency (AIFC electronic residency) and eJustice (electronic justice).
- Developed the fintech industry, provided startup support, and established a regulatory framework.

Ministry of Trade and Integration and JSC Kazpost:

- Negotiated and concluded agreements with Amazon and eBay, enabling Kazakhstani entrepreneurs to trade on these platforms starting in 2021.
- Launched Kazpost Geo, a geoinformation service that automates mail sorting. The service determines the complete delivery route using addresses, postal codes, or geotags. Integration of the W3W module allows for location accuracy within 3 meters.
- Launched Qazpost Keruen, a service facilitating orders from US and European online stores with 10-day delivery to Kazakhstan. Customers receive a virtual address for ordering from foreign retailers, with Kazpost handling delivery to Kazakhstan.

These projects yielded the following positive effects: Kazakhstan achieved a ranking within the top 30 countries for e-government development according to the UN rating. Furthermore, over 90% of government services are accessible online, significantly reducing the need for citizens to visit government agencies in person.

Case 3: Digitalization in Higher Education

- The "Digital University" project aims to establish a comprehensive digital ecosystem within universities. This includes automating core processes, from admissions and

curriculum management to online learning, digital diplomas, and integration with massive open online course (MOOC) platforms.

– Implementation of the Platonus platform for educational process management.
– Deployment of a proctoring system for online examinations.
– Launch of the Unified Higher Education Platform to centralize data from all universities in Kazakhstan.

These projects improved the transparency and efficiency of educational processes, minimized paper-based documentation, and facilitated the development of an integrated university monitoring system.

Concurrently, the "Digital National Ranking of Universities" project was launched to establish a transparent ranking system that emphasizes the digital maturity of educational institutions. The evaluation criteria include the digitalization of educational processes, research activities, management practices, and external communications.

Projects were implemented for the digital transformation of government services for businesses. These included the launch of electronic licenses and permits, the transfer of business services to a one-stop shop format via eGov, the automation of business registration procedures, and the implementation of an electronic entrepreneur's account for online access to all government services. These projects contributed to reducing administrative barriers and accelerating processes.

– Digital transformation of the construction sector: initiatives encompassing the implementation of the State Urban Development Cadastre (a unified digital platform for recording land parcels, utility infrastructure, and construction ventures), the development of a digital building passport concept (online maps detailing an object's lifecycle), and the establishment of a digital platform for the examination of design and cost estimation documents. These data-driven projects contributed to the mitigation of corruption risks in land distribution, the streamlining of project approval processes, and the enhancement of pricing transparency within the construction industry.

Case 4: Digital services in real estate and mortgage lending

All projects prioritize service convenience for citizens and businesses:

– In collaboration with the State Corporation "Government for Citizens" JSC, the electronic registration of pledges was automated using blockchain technology. This reduced pledge registration time from three business days to a maximum of two hours, significantly streamlining the housing purchase process for clients.
– Implementation of the Concierge Mortgage service. This service allows clients to connect with a video consultant, remotely submit loan applications, receive approvals, and finalize real estate purchase loans. Consequently, the mortgage acquisition process has been significantly simplified, and banking service accessibility for clients has increased.

These initiatives have enhanced the efficiency and transparency of processes within Kazakhstan's banking sector, improving service availability and quality for citizens.

Case 5: Digitalization of regional governance

1. Creation of a Data Processing Center (Data Center). The project, worth 6 billion tenge, was implemented within the framework of the state program "Digital Kazakhstan." The center ensures uninterrupted work with administrative facilities' data and opens up new opportunities for business, promoting the development of a flexible IT infrastructure in the region.

2. Digitalization of land plots. This is a project to inventory land plots in the city of Kyzylorda and adjacent villages in order to identify lands on a digital map. A unified cartography of the region was developed, which allows residents to receive up-to-date information on land resources (www.orda.geoportal.kz).

3. In 2021, 13 projects in 7 areas of digitalization were implemented in the region. In the field of education, the Safe School project was implemented, and in the field of healthcare, Picture Archiving and Communication System (PACS) systems for transmitting and archiving DICOM video, and the Electronic Medical Examination System were introduced. These initiatives are aimed at improving safety in schools and enhancing the quality of health services through digital technologies.

These projects contributed to strengthening the digital infrastructure and improving the quality of public services in the region.

CONCLUSIONS AND RECOMMENDATIONS

The analysis of five case studies revealed that digital projects were implemented primarily in service provision, yielding a significant positive impact on public service delivery, particularly in accounting and data exchange between citizens and government agencies.

Digitalization projects in the information sphere, higher education, financial management, and trade are of national scope. This aligns with the fact that women predominantly lead socially significant and sensitive sectors of Kazakhstani society. These areas were prioritized in the first of five digital transformation priorities outlined by President K.K. Tokayev in 2023. Priority 1, "Human-centeredness," emphasizes the transition to a qualitatively new format of public administration digitalization—the "Invisible Government"—where state policy focuses primarily on individuals, their needs, and interests.[6]

While a significant portion of digitalization efforts focused on telecommunications, transport, industrial IT, and banking, it is important to note that despite the relatively low representation of women in senior management, their contribution to digitalization is considerably broader. This is particularly evident when considering the social impact of projects implemented under the "Digital Kazakhstan" program.

Furthermore, attention should be directed towards the digitalization of secondary education and healthcare, sectors predominantly led by women at both executive and operational levels. These areas require additional support and the integration of digital tools.

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[6] https://astanahub.com/ru/article/glava-gosudarstva-vystupil-na-plenarnom-zasedanii-foruma-digital-bridge

At the regional management level, only one case study was presented, indicating a clear underrepresentation of women managers at this level. Yet, it is the regions that possess the greatest need for digitalization in socially significant areas of governance.

To strengthen the role of women in the digital transformation of public administration, Kazakhstan needs to develop and implement specialized support programs. Specifically, this includes issuing grants and launching accelerator programs for women leaders in digital technologies. Furthermore, educational initiatives are necessary to enhance women's skills in GovTech, artificial intelligence, and digital transformation.

The engagement of women in strategic management is a pressing issue. This requires more open and inclusive policies to increase women's access to leadership positions at both central and local levels. Developing mentorship and tutoring programs for young women in IT and public administration is advisable. Creating an inclusive digital environment will also contribute to increasing the share of women involved in the digitalization of economic sectors.

Simultaneously, new challenges are emerging, making the implementation of mechanisms to protect women from discrimination in the digital sector and programs to improve digital literacy among women more urgent. A promising direction is the creation of mentorship programs featuring successful women leaders in IT and public administration.

In addition, Kazakhstan should integrate into global initiatives on women's leadership in technology and establish partnerships with the UN, World Bank, EU, and private technology companies. Women should participate in international forums and conferences to exchange experiences in digital governance, with a focus on gender equality.

Kazakhstan has the potential to become a leader in regional digital transformation, driven by women who are already reshaping public administration. The key to this process is women's participation, particularly in aligning government policies with people's real needs. In this respect, women managers contribute a human-centered perspective to the technologization and digitalization of Kazakhstani society.

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