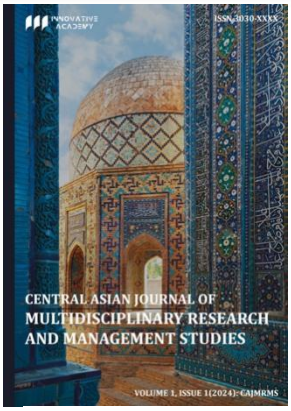

DIGITAL DEVELOPMENT IN UZBEKISTAN: ADDRESSING WEAKNESSES THROUGH FOREIGN EXPERIENCE

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ABSTRACT

The article examines the current challenges of digital development in Uzbekistan and highlights key weaknesses in the country's digitalization process. Particular attention is given to the application of international best practices (Singapore, Estonia, South Korea) in building an effective digital transformation. Based on a comparative analysis, specific recommendations are proposed to address the identified issues in the context of Uzbekistan.

INTRODUCTION

Digital Transformation as a Priority of State Policy

The relevance of this topic lies in the fact that digital transformation has become a cornerstone of sustainable economic growth, enhanced competitiveness, improved quality of life, and effective public administration in the 21st century. Digital technologies are rapidly reshaping economic models, communication methods, labor processes, and the provision of public services. In the context of globalization and accelerating technological progress, countries that fail to adapt to these changes risk falling behind and becoming marginalized in the global development landscape.

For developing countries like Uzbekistan, digitalization presents not only a challenge but also a unique window of opportunity. The adoption of digital solutions can significantly reduce bureaucratic barriers, enhance transparency in governance, combat corruption, and improve access to quality education, healthcare, and other essential services. Moreover, the digital economy holds the potential to become a powerful driver of employment—particularly among the youth—and stimulate entrepreneurship, innovation, and startup ecosystems.

In recent years, Uzbekistan has shown a strong commitment to advancing digital reforms. The launch of the national program "Digital Uzbekistan – 2030" in 2020 demonstrates the country's strategic intent to modernize critical sectors, including public administration, finance, education, healthcare, agriculture, and industry [1]. Under this framework, the the government is actively rolling out e-government platforms, digital education initiatives, remote service delivery, and tools based on big data and artificial intelligence.

Nevertheless, despite several notable achievements, the implementation of ambitious digital objectives faces several challenges. Institutional and infrastructural constraints remain, including low levels of digital literacy in certain regions, uneven access to the internet, cybersecurity vulnerabilities, and limited financial and human resources to support IT initiatives. Furthermore, weak integration between academic, educational, and entrepreneurial sectors hinders the effective commercialization of digital solutions [2].

To ensure sustainable and inclusive digital transformation, Uzbekistan must not only address domestic barriers but also actively leverage international experience. Leading digital economies such as Estonia, Singapore, and South Korea offer successful models that, the adaptation of which could significantly accelerate the country's digital development.

LITERATURE REVIEW AND METHODOLOGY

Literature Review

Digital transformation in Uzbekistan is increasingly becoming the focus of scholarly and applied research in the context of building a digital state, fostering an innovation-driven economy, and enhancing competitiveness. The existing literature on the topic addresses a range of issues, including domestic digital initiatives as well as comparative analyses of international best practices.

Key sources include:

- The World Bank Report (2023), which highlights the need for a comprehensive digitalization strategy encompassing infrastructure development, digital inclusion, and resilient cybersecurity systems [3];
- The "Digital Uzbekistan" Strategy by Sh.M. Mirziyoyev (2020), which outlines the priorities for digital modernization in public administration and the broader economy [1];
- The OECD Review (2022), which provides a methodology for assessing digital maturity and a framework of performance indicators for digital policy in developing countries [4].

Particularly valuable are comparative insights drawn from leading digital economies:

- Estonia: an advanced e-government system, digital identity (e-ID), and a unified digital space for public services [6];
- South Korea: Recognized for its sustained investment in digital education and ICT infrastructure, as well as targeted government programs aimed at reducing digital inequality [11];
- Singapore: Notable for its Smart Nation strategy, , strong governmental support for startups, and the creation of digital innovation hubs such as JTC LaunchPad and Block 71 [12, 15].

Recent studies, such as the UNDP report on digital inclusion in Uzbekistan (2023), highlight the need for a more systematic approach to integrating vulnerable groups —including women, the elderly, and rural populations—into the digital environment [16].

Notable contributions from local scholars further enrich the discourse. For instance:

- B. Khasanov (2021) examines regional disparities in digital access and the role of the education system in addressing digital inequality [7];
- A. Uktamov's (2023) emphasizes the importance of coordination among the government, business, and academia in implementing the digital inequality [17].

Taken together, the literature review demonstrates that successful digital development requires not only technological investments but also institutional flexibility, political commitment, and an inclusive approach to digital transformation.

Research Methodology

To achieve the research objectives, comparative, analytical, and systemic approaches were employed. The methodology includes of the following key components:

- Content analysis of Uzbekistan's digital development strategies, including documents such as *"Digital Uzbekistan – 2030"* and reports by IT Park;
- Comparative analysis of digital practices in Estonia, Singapore, and South Korea, identifying tools that can be adapted to the Uzbek context;
- Statistical analysis of key indicators: broadband internet coverage, digital literacy levels, number of startups, and rankings in international indices (ITU, UN E-Government Index);

- Expert review of publications by international organizations (World Bank, OECD, UNDP), as well as works by regional analysts and researchers;
- Case studies of successful digital transformation programs and institutions, such as *e-Estonia*, *GovTech Singapore*, and *KISA* in South Korea.

The conclusions and recommendations are based on the identified similarities and gaps between Uzbekistan's current situation and international practices, taking into account the country's economic, social, and cultural specificities.

RESULTS

Identified Weaknesses

As a result of analyzing Uzbekistan's digital policy and comparing it with international examples, several key weaknesses hindering the further development of the digital economy were identified.

These findings are based on a comprehensive review of government programs, statistical data, and evaluations from international digital maturity and cyber-readiness indices.

1. Low Level of Digital Literacy, Especially in Rural Areas

According to a study by the Center for Economic Research and Reforms, over 40% of the adult population in Uzbekistan struggles with basic digital skills. In rural areas, this figure reaches 60%. Many residents lack the ability to use computers, email, or mobile applications, limiting their participation in the digital economy. Contributing factors include a shortage of qualified IT instructors, outdated equipment, and limited internet access [7].

2. Insufficient Broadband Infrastructure

According to stat.uz, as of 2023, internet coverage in Uzbekistan stands at 78.3%, with 91% in urban areas and around 60% in rural regions. However, many remote areas suffer from low bandwidth, unstable connections, and lack of coverage. These limitations hinders the digital integration of essential services in sectors such as education, healthcare, and administration, reducing public access to modern online services [8].

3. Weak Cybersecurity and Lack of Specialized Centers

According to the ITU Global Cybersecurity Index (2021), Uzbekistan ranks 78th out of 194 countries, indicating an average level of development in this area. The country lacks a centralized incident response platform (CERT), and the number of cybersecurity specialists in government institutions remains limited. This makes Uzbekistan vulnerable to external threats and internal risks [9].

4. Limited Support for Technology Startups

According to the IT Park report, the number of registered startups in Uzbekistan grew by 45% by 2023 compared to 2020. However, fewer than 20% gain access to venture capital. Moreover, there is a lack of effective collaboration between universities, research centers, and the business sector, limiting innovation commercialization potential. Additionally, there is a shortage of mentorship and inadequate mechanisms for legal and financial support [10].

Based on the identified issues, well-founded proposals were developed, relying on best international practices adapted to Uzbekistan's context. These recommendations form a foundation for strategic planning and improvement of digital policy:

Area	Issue	Recommendation (International Experience)
Education	According to the Ministry of Public Education, fewer than 30% of rural schools are equipped with modern ICT resources. Digital literacy among teachers and students remains low, especially in the regions [7].	A national digital literacy program for students and teachers; integration of ICT into educational curricula, following the example of South Korea [11].
Infrastructure	According to stat.uz, as of 2023, internet coverage in Uzbekistan exceeds 78%,	Continue broadband infrastructure expansion

	with over 90% in urban areas and about 60% in rural ones. The Ministry of Digital Technologies reports that more than 10,000 base stations are being modernized under the "Digital Uzbekistan" program, with all schools to be connected to high-speed internet. Despite this progress, there remains a significant digital divide between regions and a lack of stable connectivity in hard-to-reach areas.	through PPPs; implement projects similar to national telecom networks; connect all educational institutions, following the Singapore model [12].
Security	According to a UN report, Uzbekistan is among the countries with low cyber-readiness. There is a shortage of qualified cybersecurity personnel and no centralized response system [9].	Establish a National Cybersecurity Center; train professionals and cooperate with international organizations, based on Estonia's example [13].
Startups	According to IT Park, since 2020 the number of startups has increased by 45%, but fewer than 20% receive venture funding. Problems persist in mentorship and idea commercialization [10].	Expand acceleration programs, provide tax incentives, and establish government-backed venture funds, following the examples of Singapore and South Korea [14].

Summary of Findings from the Table:

The analysis reveals that despite state support and targeted programs, Uzbekistan's digital development remains uneven and necessitates strategic recalibration. The education sector continues to face critical deficits in ICT infrastructure, hindering the widespread adoption of digital teaching methodologies. In contrast, the infrastructure sector demonstrates positive momentum, as evidenced by data from stat.uz and the Ministry of Digital Technologies; nonetheless, a significant digital divide persists between urban and rural areas.

Cybersecurity emerges as the most vulnerable domain. incident response mechanism, coupled with a shortage of qualified professionals, has left the country ill-equipped to address escalating cyber threats. In the startup sector, positive trends are already visible — such as the growth of tech initiatives and acceleration programs — but barriers to financing and integration with universities and the private sector still exist.

The table comparative table clearly highlights which areas of digital transformation are already developing steadily and which require urgent intervention and reliance on proven international practices.

DISCUSSION

The Potential of Applying Foreign Experience

International practice demonstrates that digital transformation requires a comprehensive and long-term and multi-sectoral approach. For instance, Estonia has prioritized cybersecurity and digital identification. Over 99% of public services in Estonia are available online, and the introduction of digital ID cards has enabled the country to save more than 2% of its GDP annually [6].

In South Korea, digital literacy among the population exceeds 90%. Since the 1990s, the country has invested in digital education by establishing around 1,000 digital learning centers for the elderly and rural populations by 2020 [11]. This significantly reduced digital inequality and increased citizen participation in the digital economy.

Singapore exemplifies an effective digital ecosystem: more than 94% of households have access to broadband internet, and the government actively funds startups through the Smart Nation initiative and other programs. In 2022 alone, over $1 billion was allocated to support digital innovation projects [12].

A comparative overview of digital policy approaches in leading countries is presented in the table below:

Area of Policy	Estonia	Singapore	South Korea
E-Government	99% of services available online; e-ID system; X-Road – inter-agency data exchange platform	GovTech and Smart Nation platforms for service integration and innovation	Unified e-government portal; full digital interaction between citizens and the state
Digital Literacy	Mandatory IT education in schools; free courses for the elderly	University-based digital training and nationwide online courses	~1,000 digital education centers, including in rural areas, active since the 1990s
Cybersecurity	Central CERT-EE; national cybersecurity strategy; regular cyber drills	CSA agency; strict regulation and international training programs	KISA agency; state protection of digital critical infrastructure
Startup Ecosystem	Startup Estonia; tax benefits; accelerators; crowdfunding platforms	JTC LaunchPad; venture capital programs; government R&D support	TIPS and KISED programs; state grants, accelerators, and innovation funding

These examples highlight the importance of sustained investment in digital education, a flexible regulatory environment, and strong institutional support for innovation. Uzbekistan can draw on these approaches while adapting them to its own institutional, cultural, and economic context.

CONCLUSION

The research results indicate both achievements and significant challenges in Uzbekistan's digital development. Notable achievements include the expansion of telecommunications infrastructure and the launch of innovative startup support programs. However, significant obstacles remain — such as low levels of digital literacy in the regions, cybersecurity vulnerabilities, and insufficient integration of the private sector and academia into the digital economy.

The experiences of countries like Estonia, South Korea, and Singapore demonstrate the effectiveness of a comprehensive and long-term approach to digital transformation. Key success factors include implementation of digital IDs, large-scale educational programs, and IT initiative funding has enabled them to achieve high levels of digital maturity.

For Uzbekistan these models offer valuable guidance but must be adapted to national socio-economic conditions. The main focus should be on eliminating regional disparities, training qualified personnel, developing cybersecurity, and fostering a supportive innovation ecosystem. Without coordinated efforts and broad stakeholder engagement, digital transformation risks becoming fragmented.

In conclusion, this study emphasizes the importance of a holistic and coordinated digital development strategy based on international experience and national priorities.

REFERENCES

1. Mirziyoyev, S.M. (2020). Strategy for Digital Uzbekistan — A Foundation for Modern Economic Development. Tashkent.

2. Mirziyoyev, S.M. (2017). Critical Thinking and Innovative Development as Key Priorities. Tashkent.
3. World Bank. (2023). Digital Development Overview. https://www.worldbank.org/en/topic/digitaldevelopment
4. OECD. (2022). Going Digital Toolkit. https://goingdigital.oecd.org/
5. United Nations. (2021). E-Government Survey. https://publicadministration.un.org/egovkb/en-us
6. Estonian Government. (2021). Digital Agenda 2030.
7. Hasanov, B. (2021). Development of Digital Literacy in Rural Areas. Journal of Modern Education, 9(1), 34-41.
8. Kim, S. (2020). Infrastructure and Connectivity: The South Korean Example. Asian Journal of Technology, 12(2), 77-85.
9. Cybersecurity Agency of Estonia. (2022). National Cybersecurity Strategy.
10. Lee, J., & Park, Y. (2021). Startup Ecosystems in East Asia. Tech & Society, 7(4), 212-225.
11. Ministry of ICT of Korea. (2020). Digital New Deal Strategy.
12. Singapore Smart Nation Program Office. (2022). Annual Report.
13. Estonian Information System Authority. (2022). Cybersecurity Strategy.
14. OECD. (2023). Government Support for Startups. https://www.oecd.org/startups
15. Tan, J. (2021). Singapore's Digital Economy Strategy. Journal of Asian Innovation, 15(3), 190-198.
16. UNDP Uzbekistan. (2023). Digital Inclusion Assessment Report.
17. Uktamov, A. (2023). Priorities in Uzbekistan's Digital Future. Central Asian Review of Policy, 6(2), 112-119.