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The publication is intended for young experts and consultants, researchers, decision makers, and a wide range of readers interested in the processes of the countries of the Central Asian region.

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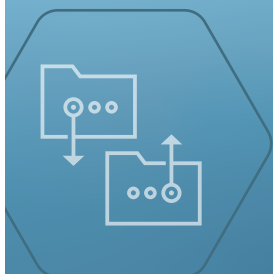
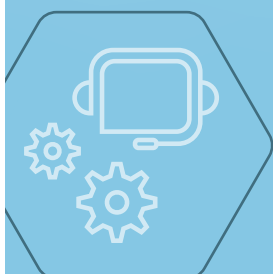
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ABBREVIATIONS

CAS	Central Asian States
DGSS	Digital Government Systems and Services
EGDI	E-Government Development Index
Gbit/s	Gigabit per second
GDP	Gross domestic product
GTMI	GovTech Maturity Index
HCI	Human Capacity Index
ICT	Information-communication technologies
IT	Information technology
ITU	International Telecommunication Union
OSI	Online Services Index
SDGs	Sustainable development goals
TII	Telecommunications Infrastructure Index
UN	United Nations



EXECUTIVE SUMMARY

The role of digital technologies and the importance of effective informatization policy have been well actualized since the beginning of the global COVID-19 pandemic. For Central Asian States (CAS) especially – Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan, digitalization has the potential to modernize and integrate national economies into the global economy, overcome major constraints, ensure digital upgrades and build information society for the benefit of the population during the post-pandemic recovery period. Under these circumstances, CAS intend to improve their digital capacity and policy reforms in order to prevail over current and future challenges. In this regard, the current processes of digital transformation in the region have been analysed by focusing on national digitalization strategies of CAS in the context of digital responses to the global pandemic. Moreover, based on findings concerning the limits and problems of hindering digital development in Central Asia, policy recommendations have been presented on reasonable digitalization policy and regional cooperation in the digital sphere.



KEY FINDINGS:

- All CAS are implementing ambitious national strategies and programs which seek out transformation into a true information society by creating a digital economy and digital government as well as achieving sustainable economic growth.
- Although approaches of CAS to the national ICT development and digitalization differ, however, they face common challenges and obstacles such as:
 - digital divide at national and regional levels;
 - the legislative framework, especially regarding privacy and personal data protection;
 - resource-related financial, technical and infrastructural obstacles;
 - internet insufficiency, its cost and speed;
 - the absence of qualified professionals with IT skills;
 - low-lying public trust in online platforms;
 - lesser level of digital literacy.
- Narrowing the digital divide at national and regional levels should be the priority for policy-makers and other stakeholders in CAS.

- Bilateral and multilateral cooperation between CAS and international partners is needed to decrease the digital divide at regional level.
- Introducing the right policy framework to enhance digitalization could strengthen not only legislative basis but also international cooperation for better information exchange and experience sharing.
- Privacy and data protection in the national legislative frameworks of CAS should be reflected upon and guaranteed. In this regard, the best foreign experience would be the EU policy of Protection of Personal Data and Privacy.
- Enhancing affordability of and access to ICT, improving quality and cost of the Internet will not only contribute to narrow the digital divide within countries and enhance digital learning platforms, but also increase digital literacy and competences among Central Asian populations.
- CAS should further support private sector's own digital transition by helping companies move toward e-commerce and by providing all possible assistance.
- It is necessary to attract more international partners and donors to ICT sector of the region. Investing in digital eco-system, ICT infrastructure and qualified IT services will facilitate CAS modernize national economies and accelerate inclusive growth in all spheres.



INTRODUCTION

The global pandemic has demonstrated the power of digital technologies and highlighted the importance of digital transformation, especially for CAS. Currently, governments, societies and businesses across the world are able to function mostly with the help of digital technologies. Indeed, “beyond ensuring continuity and connectivity, digitalization sets the foundation for a more resilient and inclusive economic transformation”.¹ Consequently, most countries both advanced and developing are improving their digitalization and digital transformation policies to overcome challenges and recover from the negative effects of the global pandemic.

In this regard, it is very much the right time to reflect on the benefits and challenges which the global pandemic brought concerning digitalization in Central Asia, explore where Uzbekistan and other CAS stand in their digital journey and compare National digitalization strategies of CAS.



RESEARCH DESIGN AND METHODOLOGY

The research design of the paper applies mixed methodological approaches such as qualitative and quantitative.

Qualitatively, secondary sources such as books, journal articles, published research works and primary sources like national legislation (national strategies and programs), official statements, speeches, international and governmental publications have been utilized.

Quantitatively, in order to assess current digital readiness of Central Asia, regional national digitalization strategies have been comparatively studied based on statistical data derived from a large panel dataset from the United Nations E-Government Survey 2022, including E-Government Development Index, Telecommunications Infrastructure Index, E-Participation Index. In addition, several reports and charts from the International Telecommunication Union and the “DataReportal” open-source informational platform have been applied to evaluate capacity for digital transformation in given countries of the region.



AIMS AND OBJECTIVES OF THE RESEARCH

CAS prioritized digitalization and the development of information-communication technologies (ICT) to modernize national economies and society starting from the early 2000-s. For instance, Uzbekistan

¹ Tang, J. & Begazo, T. “Digital stimulus packages: Lessons learned and what’s next.” The World Bank Group. December 17, 2020. <https://blogs.worldbank.org/digital-development/digital-stimulus-packages-lessons-learned-and-whats-next>

has been implementing an integrated program of National Information and Communication System Development 2013-2020, the Strategy of Actions for 2017-2021, the “Digital Uzbekistan – 2030” Strategy and other national programs to implement digital transformation in the national economy, industry and society in general. Similarly, all other CAS have their national digitalization programs named as “digital strategy” (Kazakhstan and Kyrgyzstan) and “concepts of the digital economy” (Tajikistan and Turkmenistan) which set ambitious targets for coming decades. For instance, Kyrgyzstan plans to improve the country’s position in international IT rankings – 70th in Network Readiness Index, 72nd in EGDI Index and 96th in Information Society Index by the end of 2023. Whereas Kazakhstan aims to increase digital literacy of its population to 83% and Uzbekistan plans to achieve very high EGDI level (0.86 score out of 1.0) and 100 % broadband Internet coverage by 2030.

However, according to experts, all CAS have very similar challenges and obstacles during the implementation of national digitalization strategies. Hence, there is a need to ensure effectiveness of ongoing various programs and reforms in CAS and improve processes of digitalization by applying world’s most relevant best practices.

In this regard, the main purpose of the present research paper is to conduct a comparative analysis of the current state of digitalization processes in CAS and their national digitalization strategies under the impact of the global pandemic, which has revealed certain vulnerabilities and challenges in the sphere. The research paper also aims to develop policy recommendations to improve the implementation of national strategies of CAS on digitalization and ICT in post-pandemic world.



DIGITAL READINESS OF CAS: E-GOVERNMENT INITIATIVES AS AN EFFECTIVE STRATEGY TOWARD DIGITALIZATION

E-Government is considered the main tool of digital transformation and the United Nations E-Government Survey² is the effective criteria to assess current readiness of a country for digitalization and digital transformation.³ The United Nations E-Government Survey is also recognized as a key ranking, mapping and measuring tool of the digitalization processes in any country across the world.⁴

INDEED, THE GLOBAL PANDEMIC RENEWED AND ANCHORED THE ROLE OF E-GOVERNMENT – “BOTH IN ITS CONVENTIONAL DELIVERY OF DIGITAL SERVICES AS WELL AS NEW INNOVATIVE EFFORTS IN MANAGING THE CRISIS”. THE GLOBAL “PANDEMIC HAS NOT ONLY REINVIGORATED THE ROLE OF DIGITAL GOVERNMENT IN ITS CONVENTIONAL DELIVERY OF PUBLIC SERVICES AND IN ENSURING BUSINESS CONTINUITY, IT HAS ALSO BROUGHT ABOUT INNOVATIVE WAYS IN MANAGING THE CRISIS, SUCH AS IN CONTACT TRACING, E-HEALTH, ONLINE LEARNING, AND REMOTE WORKING”.⁵

In addition, “the adoption of digital solutions has been a key factor underpinning the post-pandemic economic recovery, and the trend for rising digital inputs in manufacturing and services is expected to continue in the years ahead”.⁶

² The UN E-Government Survey, published by the UN Department of Economic and Social Affairs is prepared over a two-year period following an established methodology. It looks at how digital government can facilitate integrated policies and services across 193 UN Member States. The Survey supports countries' efforts to provide effective, accountable and inclusive digital services to all and to bridge the digital divide and leave no one behind.

³ ElMassah, S., & Mohieldin, M. (2020) Digital transformation and localizing the Sustainable Development Goals (SDGs). Ecological Economics, 169. <https://doi.org/10.1016/j.ecolecon.2019.106490>.

⁴ 2020 United Nations E-Government Survey. UN Department of Economic and Social Affairs. July 10, 2020. <https://www.un.org/en/desa/2020-united-nations-e-government-survey>

⁵ 2020 United Nations E-Government Survey. UN Department of Economic and Social Affairs. July 10, 2020. <https://www.un.org/en/desa/2020-united-nations-e-government-survey>

⁶ Beirne, J. “Harnessing digitalization on the path to sustainable economic development in Asia.” January 27, 2022. <https://www.asiapathways-adbi.org/2022/01/harnessing-digitalization-on-the-path-to-sustainable-economic-development-in-asia/>

IN RECENT YEARS WORLDWIDE, MANY COUNTRIES HAVE MADE CONSIDERABLE EFFORTS TO INCREASE THE EFFECTIVENESS OF PUBLIC ADMINISTRATION AND THEIR TRANSPARENCY BY INITIATING OVERARCHING E-GOVERNMENT POLICIES. COUNTRIES OF THE CENTRAL ASIAN REGION ARE NO EXCEPTION.

For instance, Uzbekistan considers information and communication technologies, e-government in particular, as a way to improve the quality of life of its citizens and a part of national economic development strategy.

Uzbekistan has made substantial progress in introducing e-government and ICT in public sector for the last few years, when in 2013 was launched “Single portal of interactive government services” – central e-government service of the country. In a relatively short period of time, Uzbekistan has achieved some visible results although there are still some tasks to do.

The new President of Uzbekistan Shavkat Mirziyoyev, from the first days of his presidency among other liberal reforms, prioritized administrative reforms with a greater degree of transparency and openness. Two main documents such as the “The Strategy of Actions on Five Priority Areas of Development of the Republic of Uzbekistan for 2017-2021” and “The Concept of administrative reform in the Republic of Uzbekistan” were adopted as national action plans aimed at further reforming public administration both at central and local levels.

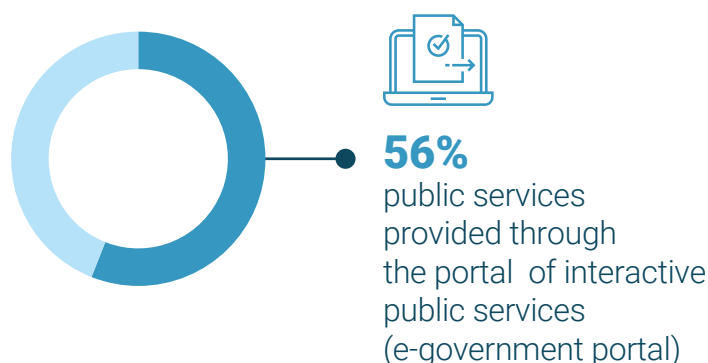
According to the Strategy of Actions for 2017-2021 the first priority included improving the system of state and public construction, public control mechanisms, enhancing quality and efficiency of public services, improving the “e-government” system, increasing competence, quality of public services and of ordinary citizens to such digital platforms.

Moreover, digital economy and improving e-government were highlighted by the new president, in addition much resources were invested in broadband infrastructure which built solid foundations for IT ecosystem and digital education.⁷

⁷ Avliyokulov, B. “Speeding up digital transformation to tackle COVID-19 in Uzbekistan.” UNDP Europe and Central Asia. August 19, 2020. <https://www.eurasia.undp.org/content/rbec/en/home/blog/2020/speeding-digital-transformation-uzbekistan.html>

Accordingly, the total length of fiber-optic communication lines in the country has been remarkably expanding since 2016. For instance, during 2017-2022 it has increased almost 6 times and reached 118 thousand kilometers as of January 2022.⁸

As of January 2022, in Uzbekistan following the public administration reforms and digitalization of the sphere 56% public services provided through the portal of interactive public services (e-government portal). The number of public services on the e-government platform of the country (my.gov.uz) reached 307 and 1.3 million citizens are actively using such electronic public services.⁹ Whereas, the total number of Internet users in Uzbekistan reached 27.2 million.¹⁰



Further reforms in public administration and wide digitalization plans are also reflected in Uzbekistan's New Development Strategy for 2022-2026. The document has been adopted on January 28, 2022, which covers seven priority areas of reforms and includes hundred target goals that will be achieved by 2026.

Improvement of the e-government of Uzbekistan and bringing the share of electronic public services to 100% have been targeted in the new Development Strategy of the country. In addition, implementation of "Mobile ID-identification" system of a person in the provision of public services, introduction of "digital passport of citizens" and "digital authority" project have been prioritized to digitalize public administration and optimize administrative procedures at central and local levels.¹¹

⁸ The Ministry for Development of Information Technologies and Communications of the Republic of Uzbekistan. "The total length of fiber-optic communication lines." <https://mitc.uz/en/stat/6>

⁹ Single portal of interactive government services. "My.gov.uz in numbers." February 03, 2022. <https://my.gov.uz/ru/news/728>

¹⁰ The Ministry for Development of Information Technologies and Communications of the Republic of Uzbekistan. "Total number of Internet users (thousands)." <https://mitc.uz/en/stat/2>

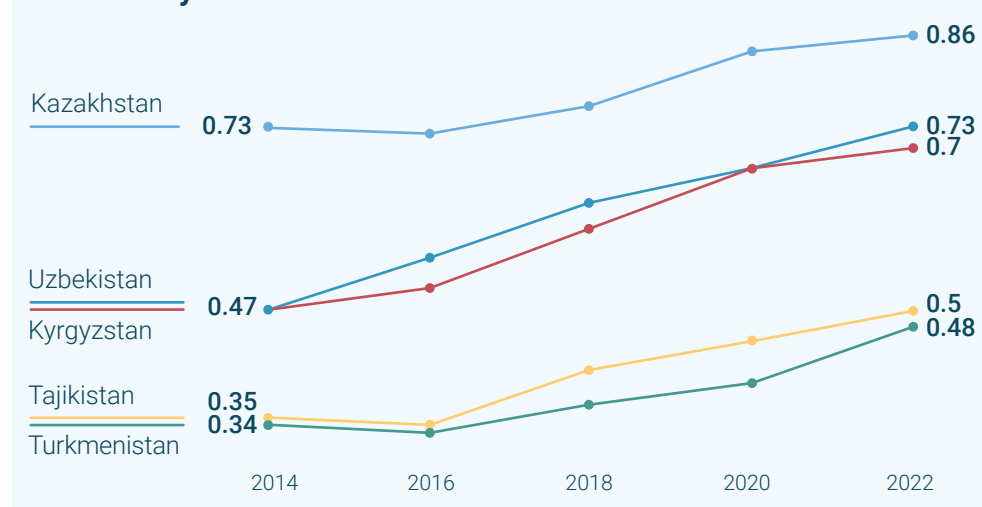
¹¹ Decree of the President of the Republic of Uzbekistan No. UP-60 "On approval of the Development Strategy of the New Uzbekistan for 2022-2026" dated January 28, 2022 <https://lex.uz/docs/5841077>

DIGITAL GOVERNMENT TRANSFORMATION DYNAMICS IN CAS

Regarding digital government transformation dynamics of in the region, it should be noted that overall, Uzbekistan and other CAS have made serious commitments to adopt the path of a democratic civil society. E-government reforms in the region made significant steps toward open governance, participatory democracy, and an inclusive society, firstly moving these elements to the agenda of administrative reforms.¹²

In the recent E-Government Survey-2022 ranking of CAS, **Kazakhstan** is in 28th place with a very high EGDI¹³ – 0.8628, **Uzbekistan** was given 69th position (the second in CA) with a high EGDI – 0.7265, **Kyrgyzstan** 81st position also with a high EGDI – 0.6977 and the two trailing countries are **Tajikistan** 129th with an average EGDI of 0.5039 and **Turkmenistan** 137th with an average EGDI of 0.4808.¹⁴

Figure 1. **Digital government transformation dynamics of CAS**



Source: Compiled by author based on data from «The UN E-Government Survey» for 2014-2022

¹² Kuldosheva, G. (2021). Challenges and Opportunities of Digital Transformation in the Public Sector in Transition Economies: Examination of the Case of Uzbekistan. ADBI Working Paper 1248. Tokyo: Asian Development Bank Institute. <https://www.adb.org/publications/challenges-opportunities-digital-transformation-uzbekistan>

¹³ The assessment of values reflected in the E-Government Development Index (EGDI) composite with three components: The Online Services Index (OSI), the Telecommunications Infrastructure Index (TII) and the Human Capacity Index (HCI). Countries in the low EGDI group have EGDI values of between 0.0 and 0.25, those in the middle EGDI group have values in the 0.25-0.50 range, countries in the high EGDI group have values of 0.50 to 0.75, and those in the very high EGDI group have values of 0.75 to 1.00.

¹⁴ 2022 United Nations E-Government Survey. UN Department of Economic and Social Affairs. September 29, 2022. <https://desapublications.un.org/sites/default/files/publications/2022-09/Web%20version%20E-Government%202022.pdf>



As a result of the analysis, a clear division was revealed according to the levels of development of digitalization in the Central Asian countries into three clusters:

- **1. Very high** (EGDI > 0.75) – **Kazakhstan.**
- **2. High** (EGDI from 0.5 to 0.75) – **Uzbekistan, Kyrgyzstan and Tajikistan.**
- **3. Medium** (EGDI from 0.25 to 0.5) – **Turkmenistan.**

Table 1. Central Asian countries in the UN E-Government Development Index 2020-2022

Country	Level of EGDI	Rank EGDI 2020	Rank EGDI 2022	Change
Kazakhstan	Very High	29 (0.8375)	28 (0.8628)	↑ 1
Kyrgyzstan	High	83 (0.6749)	81 (0.6977)	↑ 2
Uzbekistan	High	87 (0.6665)	69 (0,7265)	↑ 18
Tajikistan	High	133 (0.4649)	129 (0.5039)	↑ 4
Turkmenistan	Middle	158 (0.4034)	137 (0.4808)	↑ 21
World Average		0.5988	0.6102	
Region Average		0.6373	0.6493	
Sub-Region Average		0.6094	0.6543	

Source: Compiled by author based on data from "The UN E-Government Survey" for 2020-2022

According to the World Bank’s GovTech¹⁵ Maturity Index (GTMI) on the level of digitalization of government in CAS, three out of five countries – Kazakhstan, Kyrgyzstan and Uzbekistan have made significant focus on GovTech (“B” category). However, Turkmenistan is the only country in the region with minimal level of public sector modernization (“D” category).

Table 2.

Level of digitalization of government in Central Asia

Country	GovTech Maturity Index, 2020	Human resources management information system
Kazakhstan	B*	Yes, centralized
Kyrgyzstan	B	Yes, centralized
Uzbekistan	B	Yes, centralized
Tajikistan	C	No
Turkmenistan	D	No

***Group description**

A	GovTech leader countries that use advanced/ innovative digital solutions and demonstrate good practices in all four GovTech focus area
B	Countries with a significant focus on GovTech
C	Countries with some focus on GovTech
D	Countries with minimal focus on GovTech

Source: World Bank Group Digital Government/GovTech Systems and Services (DGSS) dataset.

¹⁵ GovTech is a whole of government approach to public sector modernization. GovTech emphasizes three aspects of public sector modernization: citizen-centric public services that are universally accessible, a whole-of-government approach to digital government transformation, and simple, efficient and transparent government systems.
<https://www.worldbank.org/en/programs/govtech>

One indicator of government digitalization is the number of central administration systems that have been digitalized. Countries of Central Asian region except Tajikistan and Turkmenistan have at least four systems in place.¹⁶

Several scholars such as E.Johnson, B.Kolko, S.Maerz, M.Kneuer, and S.Harnisch critically assess e-government initiatives of CAS. They drew attention to expanding internet facilities (including e-government) in the Central Asian region, meanwhile, were sceptic that it could improve transparency and foster democratization. In contrast, these researchers proposed the hypothesis that in Central Asia “regimes set up e-government as a response to globalization pressures and to demonstrate modernity and legitimacy to the international community”.¹⁷

According to Maerz e-government and/or e-participation indicators in the UN Surveys does not reflect real intentions and strategic motives of CAS’s governments mainly because of methodological and conceptual problems.

However, along with requirements of current trend at global level and economic benefits the necessity of introducing e-government in the Central Asian countries derived also from the high corruption levels in the CAS where implementing “e-government systems can decrease the level of corruption and improve the openness of governments for better service delivery to citizens.”¹⁸ Brimkulov and Baryktabasov has also pointed out several issues which “affect the result of e-government implementation initiatives such as the level of development of ICT infrastructure, citizen’s literacy in general and ability to use ICT in particular, the level of economic development, the level of legal framework development, political leadership etc.”¹⁹

*ACCORDING TO THE EXPERTS, ALL CAS HAVE
VERY SIMILAR OBSTACLES AND CHALLENGES
AT THE IMPLEMENTATION STAGES
OF E-GOVERNMENT PROGRAMS.*

¹⁶ World Bank. (2021). Europe and Central Asia Economic Update, Spring 2021: Data, Digitalization, and Governance. The World Bank.

¹⁷ Maerz, S. F. (2016). The electronic face of authoritarianism: E-government as a tool for gaining legitimacy in competitive and non-competitive regimes. *Government Information Quarterly*, 33(4), 727-735.

¹⁸ Brimkulov, U., & Baryktabasov, K. (2018). E-government development in the Central Asian states: best practices, challenges and lessons learned. In *International E-Government Development* (pp. 121-154). Palgrave Macmillan, Cham.

¹⁹ Brimkulov, U., & Baryktabasov, K. (2018). E-government development in the Central Asian states: best practices, challenges and lessons learned. In *International E-Government Development* (pp. 121-154). Palgrave Macmillan, Cham.

*THE FIRST CATEGORY OF BARRIERS OF E-GOVERNMENT
DEFINED AS “THE DIGITAL DIVIDE, LACK
OF QUALIFICATIONS AND SPECIFIC KNOWLEDGE OF CIVIL
SERVANTS, AND CITIZENS’ LACK OF IT SKILLS”.*

In point of the experts, “low levels of income, insufficient development of ICT infrastructure, high price of Internet access, and insufficient education in IT skills” are main reasons of above-mentioned factors. In addition, corruption, the insufficient development of ICT infrastructure, ineffective coordination between state bodies for e-governance, low-lying accountability and transparency, absence of evaluation and monitoring of ongoing projects, adequate financing of e-government projects, low level of information security and privacy were mentioned as the main factors hindering e-government projects in Central Asia.



NATIONAL DIGITALIZATION STRATEGIES OF CAS

CAS prioritized digitalization and development of ICT to modernize national economies and society yet in early 2000s. Similarly, all other CAS have current national digitalization programs (Table 5) that titled as “Digital Strategy” in three out of five countries: “Digital Kazakhstan” 2018-2022; “Digital Kyrgyzstan” 2019-2023 and “Digital Uzbekistan – 2030”.

Whereas Tajikistan and Turkmenistan prioritized their digital transformation programs in the framework of broader national development and/or digital economy programs. For example, “Concept of the digital economy in the Republic of Tajikistan” which is derived from “the National Development Strategy of the Republic of Tajikistan for the period of 2030.” Turkmenistan’s digitalization based on the “Concept for the development of the digital economy of Turkmenistan in 2019-2025.” These ambitious national programs and strategies are mostly focused on developing digital economy and improving ICT infrastructure of CAS.

Table 3. Internet penetration rate in CAS 2021-2022

Country	Official statistics of CAS 2021	DataReportal 2022	The UN E-Government Survey 2022
Kazakhstan	84,2	85.9	85.94
Uzbekistan	78	70.4	71.1
Kyrgyzstan	70	51.1	51
Tajikistan	40	40.1	21.96
Turkmenistan	35	38.1	21.25

Official data from the Governments (The Ministry for Development of Information Technologies and Communications of the Republic of Uzbekistan, Ministry of economic development and trade of the Republic of Tajikistan, Electronic government of the Republic of Kazakhstan, State committee on Information and Communication Technology of the Kyrgyz Republic)

For the last decade Uzbekistan has implemented various programs and invested remarkable resources to modernize national ICT infrastructure. “Ongoing development goals also include improving the investment climate by reducing state regulation and assuring property rights.”²⁰

²⁰ Ergasheva, A. “How Uzbekistan is transforming into a digital society in the time of COVID19.” ORF. Jun 27, 2020. <https://www.orfonline.org/expert-speak/how-uzbekistan-is-transforming-into-a-digital-society-in-the-time-of-covid19-68640/>

Uzbekistan's integrated program of National Information and Communication System Development 2013-2020, the National Actions Strategy 2017-2021, the Development Strategy of the New Uzbekistan for 2022-2026, the "Digital Uzbekistan – 2030" Strategy and other national programs aim to implement digital transformation of national economy, industry and society in general. "The Uzbekistan government already recognized the power of digitalization in transforming society, but the COVID-19 pandemic has made that transformation essential."²¹

It should be noted that Uzbekistan has taken a course towards large-scale development of the IT sector and digitalization processes. Since the creation of IT parks, the industry's export volume has increased 50 times and reached \$ 40 million dollars. It is planned to increase the share of the digital economy in the gross domestic product and provide benefits in the field of electronic services. Moreover, by the end of 2022, the share of services provided through the Single Interactive Portal of Public Services (e-government) will increase to 60 %, and also the Safe City system will be fully launched by 2026.²²

Table 4. ICT access for population in CAS

Country	Households with Internet access at home (2020)	Households with a computer at home (2020)
Kazakhstan	92%	84%
Uzbekistan	94%	41%
Kyrgyzstan	70% (2018)	12% (2019)
Turkmenistan	49% (2019)	44% (2019)
Tajikistan	27% (2017)	21% (2017)

Source: Compiled by author based on data from the Digital Development Dashboard, The International Telecommunication Union (ITU), 2020

²¹ Avliyokulov, B. "Speeding up digital transformation to tackle COVID-19 in Uzbekistan." UNDP Europe and Central Asia. August 19, 2020. <https://www.eurasia.undp.org/content/rbec/en/home/blog/2020/speeding-digital-transformation-uzbekistan.html>

²² Presentation of plans for the development of information technology takes place. December 24, 2021. <https://uzdaily.uz/en/post/70427>

Among expected results of “Digital Uzbekistan – 2030” Strategy are high-quality and inexpensive Internet and mobile communications, a reduction in the digital divide between cities and villages, the dominance of electronic recording and an intensification of the fight against corruption.²³ Adoption of the “Digital Uzbekistan – 2030” Strategy and the “road map” for its implementation in 2020-2022 creates, first of all, a legal basis for the transition to a digital economy. The document includes such priority areas as the development of digital infrastructure, e-government, the national digital technology market, education and advanced training in the field of information technology.

The implementation of the Strategy will ensure the provision of high-quality digital services to the population, reduce corruption, increase the level of citizen involvement in government decision-making processes and modernize the system of higher and secondary education in order to ensure the competitiveness of citizens not only within the country, but also in the regional and global labor markets.

The Strategy contributes the implementation of other national strategic documents and programs and, first of all, will be important for achieving the National goals and objectives of Sustainable Development Goals for 2030 and the Development Strategy of the New Uzbekistan for 2022-2026.

²³ Abidkhadjaev, U. “The Digital and Green Agendas of New Uzbekistan.” December 7, 2021. <https://valdaiclub.com/a/highlights/digital-and-green-agendas-of-new-uzbekistan/>

Table 5. Main Documents Regulating the Development of the Digital Economy and Digitalization Programs in CAS

Country	National Programs	Goals and Directions of Digitalization	Expected Results
Kazakhstan	Digital Kazakhstan 2018–2022	<ul style="list-style-type: none"> • Digitalization of economic sectors; • Transition to a digital state; • Implementation of the digital Silk Road; • Development of human capital; • Creation of an innovative ecosystem. 	<ul style="list-style-type: none"> • The share of e-commerce in the total volume of retail trade will reach 2.6%; • 300 thousand new jobs will be created through digitalization; • The share of digital public services will be 80%; • Internet penetration level will rise to 82%; • The level of digital literacy of the population will reach 83%; • Country's position in the ICT Development Index will be 30th in the world.
Kyrgyzstan	Digital Kyrgyzstan 2019–2023	<ul style="list-style-type: none"> • Creating new opportunities for the population through the development of digital skills • Providing high-quality digital services, improving efficiency, productivity, transparency and accountability. • Ensuring economic growth through the digital transformation of priority sectors of the economy, strengthening international partnerships and creating new economic clusters. 	<ul style="list-style-type: none"> • Transition to the Digital State; • Developed Digital Economy; • Improved digital skills and literacy of the population • The share of digital public services will be 80%; • The number of state bodies connected to the "Tunduk" system will be 45. • Improving country's position by 2023 in the following world rankings: • ICT Development Index – 86th in the world; • E-Government Development Index – 72th in the world;

Country	National Programs	Goals and Directions of Digitalization	Expected Results
Tajikistan	The Concept of the Digital Economy <i>The concept is based on the National Development Strategy of the Republic of Tajikistan for the period up to 2030</i>	<ul style="list-style-type: none"> • Strengthening the regulatory framework and state policy in the field of introduction of new technologies; • Creation of modern digital infrastructure and provision of ubiquitous broadband access; • Development of modern communication systems; • Creation of data centers and digital platforms; • Digitalization of the social sphere, energy sector, agriculture; • Creation of new sectors, such as financial technology (fintech); • Digitalization of the National Bank of Tajikistan. • Training of qualified personnel; • Creation of a digital transformation management model; • Determination of key targets for the success of digitalization; • Information and educational support of digital transformation. 	<ul style="list-style-type: none"> • The electronic document management program will be introduced; • Broadband penetration from 2G to 3G/4G in rural areas will be increased; • The speed of internet will be increased; • The cost of Internet will be reduced; • The number of users of digital services will be increased; • Digital skills and literacy of the population will be improved; • Excellence and Digital Innovation Centre will be established.
Turkmenistan	Concept for the development of the digital economy of Turkmenistan in 2019-2025.	<ul style="list-style-type: none"> • Creation of a state authorized interdepartmental commission; • Development of the Program and the "Roadmap" for Digital Economy; • Monitoring of the technical base of business entities to prepare for digitalization; • Improving material, technical and legislative basis; • Improving digital qualifications of personnel. • Comprehensive implementation of digital communication systems; • Development of the «One Window» service. • Implementation of digitalization projects in the sectors of economy. • In the tele-communications industry, modernization is planned with the use of 3G, 4G, and in the future 5G high-speed Internet and other services. 	<ul style="list-style-type: none"> • Transition to Digital Economy will be carried out; • Material, technical, legislative basis of digitalization will be improved; • Qualified personnel will be provided; • Comprehensive digital communication systems will be formed; • "One Window" service will be established; • 5G high-speed Internet and other services will be provided; • IT will be introduced into telemedicine, distance education, transport management, security and public order.

Country	National Programs	Goals and Directions of Digitalization	Expected Results
Uzbekistan	Digital Uzbekistan 2030	Digital transformation of <ul style="list-style-type: none"> • regions; • industries; Development of <ul style="list-style-type: none"> • public administration; • public services to the population and business entities; • e-government; • digital economy; • digital industry; • digital education; • digital infrastructure; • national digital technology market; • innovative products; • human capital and building digital skills; • effective information security system 	<ul style="list-style-type: none"> • The level of Internet connection will be increased from 78 to 95% in 2022; • National ID-card system for citizens will be introduced; • 20 thousand kilometres of fiber-optic lines will be conducted in 2022; • More than 400 information technologies, electronic services and other software products will be introduced; • Through "One Million Uzbek Coders" program over 600 thousand people will be educated to the basics of computer programming; • Over 280 information systems and software products for the automation of management, production and logistics processes will be implemented; • By the end of 2023, over 200 specialized schools with in-depth study of IT will be created; • By the end of 2022, each settlement of the country will be connected to the Internet with a speed of 10 Mbit /s;

Source: Compiled by author based on data from official sources of Central Asian governments such as The Ministry for Development of Information Technologies and Communications of the Republic of Uzbekistan, Ministry of Economic Development and Trade of the Republic of Tajikistan, Electronic Government of the Republic of Kazakhstan, State Committee on Information and Communication Technology of the Kyrgyz Republic.

DIGITAL RESPONSE TO THE GLOBAL PANDEMIC IN CAS

Since mid-March 2020, official cases of COVID-19 have been registered in several countries of the Central Asian region which later began negatively impacting various aspects of daily life in society. Obviously, not only the region, but also the most developed countries of the world were not ready for the challenges of the global pandemic. In fact, COVID-19, along with causing social and economic difficulties, has revealed serious problems in the healthcare systems, social protection policies and other fields of public sector of most countries.

In order to mitigate and fight against the health crisis, many countries across the globe have initiated various instruments and online platforms such as information portals on COVID-19, online services for the supply of medical facilities and goods and virtual and tele-medicine appointments. CAS, along with general health and economic measures, have accelerated their digitalization processes to enrich anti-crisis instruments and mitigate the consequences of the global pandemic.

Regarding regional reactions to the global pandemic with digitalization measures, the report of the OECD on Central Asia has revealed that policy responses to the COVID-19 throughout Central Asian countries vary significantly.

*MOSTLY KAZAKHSTAN, KYRGYZSTAN AND UZBEKISTAN
HAVE INCREASED DIGITALIZATION MEASURES WHEREAS
TAJIKISTAN AND TURKMENISTAN WERE RELUCTANT
DUE TO CERTAIN FACTORS.*

For instance, **Kyrgyzstan** “has further implemented digital initiatives and moved more than 80 government services online through the Tunduk initiative, while **Uzbekistan** has accelerated the development of online one-stop shops and other e-services. The government of Uzbekistan had also opened a Call center to help traders with their queries, and used the moment to expand digitalization in customs and trade procedures. These measures amounted to a concerted effort from regional policymakers to keep trade flowing.”²⁴

²⁴ OECD. “COVID-19 crisis response in Central Asia.” November 16, 2020. https://read.oecd-ilibrary.org/view/?ref=129_129634-ujyjsqu30i&title=COVID-19-crisis-response-in-central-asia

During the strict containment period in **Uzbekistan** and **Kazakhstan** government affiliated bodies (healthcare and law enforcement agencies) had practiced new technologies such as mobile tracking app and video surveillance technology to monitor self-isolation and wearing medical masks and other violators of the quarantine regime which demonstrated these countries relative advanced technological capabilities compared to other neighbouring countries although “safe” or “smart” city concepts are being implemented in the capitals of **Kyrgyzstan** and **Tajikistan**.

However, the rapid reorientation of existing surveillance technologies toward public health-oriented uses by all CAS during the pandemic have been “heightening existing concerns of rights and privacy.”²⁵

In **Uzbekistan** the first case of coronavirus infection was detected on 15th March 2020, spurring the leadership to take immediate measures against the COVID-19 outbreak to curb the spread of the virus in the country. The Republican Anti-Crisis Commission was created and the strict quarantine regime had been introduced in the country. In order to contain the spread of the coronavirus among the population public health measures were immediately implemented. Later on “economic measures were the second step to maintain national business activity. Moreover, several measures were taken to prevent the dissemination of fake news in the media and on social networks; therefore, official channels were established to disseminate reliable information on the current status of the pandemic in the country and around.”²⁶

During the COVID-19 pandemic, especially in the quarantine periods, the role of digital technologies has significantly increased in the country and Uzbekistan has strengthened its ICT capacity. On other hand, the public and private sectors have also increasingly turned to digital tools in order to maintain business continuity, which consequently accelerated the pace of digitalization in Uzbekistan.²⁷

Moreover, with the improvement of legal and organizational basis of banking system, especially, online payments, transfers and internet services in general, e-commerce and delivery services remarkable enhanced in the country which in turn demonstrated real progress toward digital economy and digital transformation.

²⁵ Putz, C. “Technology and Policing a Pandemic in Central Asia.” *The Diplomat*. May 13, 2020. <https://thediplomat.com/2020/05/technology-and-policing-a-pandemic-in-central-asia/>

²⁶ Tulyakov, E. “Uzbekistan’s Efforts to Fight Against COVID-19: Regional and International Cooperation.” *Caspian Policy Center*. December 17, 2020. <https://www.caspianpolicy.org/uzbekistans-efforts-to-fight-against-covid-19-regional-and-international-cooperation/>

²⁷ WHO & UNDP. “Uzbekistan COVID-19 situation report.” September 14, 2020. https://reliefweb.int/sites/reliefweb.int/files/resources/COVID19%20SitRep%20Uzbekistan%2014-09-2020_FINAL.pdf

In some extent, quarantine and containment measures of Uzbekistan have accelerated the implementation of State Program 2020 for the “Year of the Development of Science, Education and the Digital Economy” in the direction of informatization of national economy and the widespread introduction of modern information and communication technologies in main sectors of the country. In this vein, the President of Uzbekistan Shavkat Mirziyoyev’s Decree on October 5, 2020 has approved countries above mentioned Strategy “Digital Uzbekistan – 2030” and “Roadmap” for its implementation.

In **Kazakhstan** the global pandemic has pushed for a massive transition to the digital environment as well (Karimova, 2020). Ministries of Health and Internal Affairs of Kazakhstan have partially turned to technological solutions to mitigate the impact of the COVID-19 pandemic. The ‘Smart Astana’ tracking app was recommended to monitor self-isolation of citizens. Whereas, in Almaty city “Sergek” video surveillance technology was used to control containment measures.

“HOWEVER, KAZAKH AUTHORITIES’ EXPERIENCE OF USING SURVEILLANCE TECHNOLOGIES AS A DIGITAL RESPONSE FOR COVID-19 PANDEMIC IS NOT A NEW SOLUTION TO THE HEALTH CRISIS; THEY ARE UTILIZING EXISTING TECHNICAL CAPACITIES TO DEAL WITH THE PROBLEM AFTER MORE CONVENTIONAL APPROACHES FELL SHORT.”²⁸

Kyrgyzstan also had to pay special attention to the digitalization of its healthcare system due to the global pandemic. Existing infrastructure had experienced problems with the rapid processing of incoming patient data and monitoring the situation. Therefore, electronic medical records have been introduced in 60 medical institutions in the country, and their implementation is underway in the regions.²⁹ With the introduction of the state of emergency, most government agencies switched to remote operation via the ‘Infodocs’ electronic document management system and more than 80 government services are being offered online through the Tunduk system.

²⁸ Gussarova, A. “Kazakhstan Experiments with Surveillance Technology to Battle Coronavirus Pandemic.” The Jamestown Foundation. April 8, 2020. <https://jamestown.org/program/kazakhstan-experiments-with-surveillance-technology-to-battle-coronavirus-pandemic/>

²⁹ Kurenev, G. (Глеб Куренев). Цифровизация Кыргызстана. Технологии, которые способны улучшить жизнь [Digitalization of Kyrgyzstan. Technologies that can improve life]. Kabar News Agency. August 26, 2020. <http://kabar.kg/news/tcifrovizatsiia-kyrgyzstana-tehnologii-kotorye-sposobny-uluchshit-zhizn/>

Governments of CAS “have also moved to accelerate the digitalization of public services and tax administration, which was already under way, helping businesses connect to e-commerce platforms and creating new services, such as cash transfers and issuance of electronic permits for urban circulation during the confinement.”³⁰

In the meantime, the Central Asia region remains one of the least digitally connected regions, but most governments in the region committed to a digital future. With the onset of the COVID-19, these plans will need to be accelerated. According to the United Nations E-Government Survey 2022, in CAS significant downside risks to digitization remain, central of them being the rural-urban digital divide which might affect a number of areas:

- the ability of children to access online education;
- the ability of households to access online banking and receive cash transfers electronically;
- the ability of the unemployed to access online employment support;
- and the possibility to exploit new online income-generating possibilities.



³⁰ OECD. “COVID-19 crisis response in Central Asia.” November 16, 2020. https://read.oecd-ilibrary.org/view/?ref=129_129634-ujyjsqu30i&title=COVID-19-crisis-response-in-central-asia

CONCLUSIONS AND RECOMMENDATIONS

The digital technologies as the driving locomotives during the global health crisis also accelerate digitalization progress in other areas such as public administration, education, medicine, employment and etc. Moreover, digitalization makes possible to maintain consistency in the functioning of the business activity of both public and private firms and companies, and also explores opportunities which must be used for the benefit and prosperity of nations across the globe.

In general, countries of Central Asia have been implementing ambitious national strategies and programs which aim at transforming into true information society by creating digital economy and digital government as well as achieving sustainable economic development and growth.

Based on the United Nations E-Government Survey 2022 and data from the “DataReportal” open-source informational platform it is possible to conclude that although approaches of CAS to the national ICT development and digitalization differ, however they face common challenges and obstacles which could be listed as follows:

- digital divide at national and regional levels;
- the legislative framework, especially, regarding privacy and personal data protection;
- resource-related obstacles such as financial, technical and infrastructure;
- internet insufficiency, its cost and speed;
- absence of qualified professionals with IT skills;
- low-lying public trust in online platforms;
- lesser level of digital literacy.



Consequently, narrowing the digital divide at national and regional levels should be priority for policy-makers and other stakeholders in CAS. At national level governments should improve IT infrastructure in remote areas and territories by providing equal opportunities. At regional level bilateral and multilateral cooperation between CAS and with international partners are needed to decrease the digital divide among Central Asian countries.



Introducing the right policy framework to enhance digitalization could strengthen not only legislative basis but also international cooperation for better information exchange and experience sharing. In turn, less developed ICT infrastructure and the legislative framework of the digitalization of hinder access to national legislature. In addition, privacy and data protection in the national legislative frameworks of CAS should be reflected and guaranteed in the process of law-making and revising existing legislation. In this regard, the best foreign experience would be the EU policy of Protection of Personal Data and Privacy.



Concerning resource-related obstacles CAS with limited financial resources should attract international partners and donors by diversifying their geography. Investing in digital eco-system, ICT infrastructure and qualified IT services will facilitate CAS modernize national economies and accelerate inclusive growth in all spheres.



Enhancing affordability of and access to ICT, improving quality and cost of the Internet will not only contribute to narrow the digital divide within countries and enhance digital learning platforms, but also increase digital literacy and competences among population.




Certainly, in the context of the global pandemic and in general digital technology and services play a central role in recovering from the pandemic and also building resilient economies. Therefore, expanded digitalization and digital transformation of CAS should be the main priorities. CAS could also further support private sector's own digital transition by helping companies move toward e-commerce and by providing all possible assistance. Importantly the post-pandemic recovery plans in CAS should include support for digitalization and digital transformation for the benefit of their population, national economy and inclusive sustainable development of the entire region.



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