



THE ROLE OF SPECIAL ECONOMIC ZONES IN THE DIGITAL TRANSFORMATION OF CENTRAL ASIA

Azimzhan
Khitakhunov

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*DIGITAL
TRANSFORMATION*

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Central Asia Regional Economic Cooperation (CAREC) Institute
21st Floor, Commercial Building Block 8, Vanke Metropolitan,
No. 66 Longteng Road, Shuimogou District, Urumqi, Xinjiang, the PRC, 830028
f: +86-991-8891151

[LinkedIn: carec-institute](#)

km@carecinstitute.org

www.carecinstitute.org

Table of Contents

Abbreviations.....	3
Abstract.....	4
introduction	5
Methodology and Data	6
Review of Digital Policies of Central Asian Countries	6
Digital Kazakhstan.....	6
Digital The Kyrgyz Republic.....	8
Digital Uzbekistan	9
Digital strategy results and achievements in Central Asian countries.....	9
Special Economic Zones in Central Asia.....	13
Overview of the global SEZ experience and its effects.....	13
Astana Hub of Kazakhstan	15
High-Technology Park of The Kyrgyz Republic.....	17
IT-Park of Uzbekistan	19
Potential of Central Asian Technology Hubs.....	21
Policy Recommendations.....	24
Conclusion.....	25
References	26

Abbreviations

AI	artificial intelligence
CA	Central Asia
EAEU	Eurasian Economic Union
EGDI	E-Government Development Index
EU	European Union
FDI	foreign direct investment
GDP	gross domestic product
GII	Global Innovation Index
HTP	high-tech park
ICT	information and communications technology
IT	information technology
MNC	multinational corporation
PIT	park of innovative technologies
R&D	research and development
SEZ	special economic zone
UN	United Nations

Abstract

This report reviews digital policies in Central Asia (CA) and analyzes the role of special economic zones in the digital transformation of the region. It reviews and analyzes the digital strategies of Kazakhstan, the Kyrgyz Republic, and Uzbekistan, in particular. The report shows that all countries pursue digital strategies to transform their economies, digitalize public and private services, and find new sources of economic and technological growth. It analyzes and provides results and achievements of the implementation of digital strategies in the selected Central Asian countries. The report reviews the global experience of the establishment of special economic zones (SEZs) and analyzes the case of Belarus' HTP.

SEZs are an important part of the industrial policies of CA. All zones have tax and trade preferences, and the support measures are wide. Astana Hub in Kazakhstan, IT-Park Tashkent in Uzbekistan, and High-Tech Park in the Kyrgyz Republic show promising results in terms of growth revenues, exports, and attraction of foreign companies. These SEZs play an important role in the digital transformation of CA.

introduction

Special economic zones (SEZs) are important tools for structural transformation in many countries, especially developing ones. There is no single official definition of a SEZ. SEZs are specific areas within a country, frequently physically secured, which receive special treatment, generally in terms of customs, business law, and taxation. They have different sizes, ranging from single factories to large cities. SEZs include different concepts, including free trade zones, free ports, export processing zones, and economic cooperation zones. Fiscal policies and tax incentives are often used to attract both foreign and domestic investors (Chaisse & Ji, 2020).

SEZs can be effective instruments for the promotion of industrialization and structural transformation. Countries establish these zones to achieve policy objectives such as attracting foreign direct investment (FDI), promoting exports and industrialization, alleviating unemployment, supporting strategies of wider economic reform, and introducing new policies and approaches. SEZs can contribute to protecting the environment and promoting green growth and eco-friendly cities. Successful zones can attract large numbers of multinational companies (MNCs) and domestic firms. SEZs generally operate under more liberal economic laws, are serviced with efficient public services (such as, customs and licensing), and have better and more reliable infrastructure and fiscal incentives, including capital freedoms, tax incentives, and subsidies (Zeng, 2016).

A new wave of industrial policies and increasing competition for internationally mobile investment can be important factors for the establishment of new SEZs, which face challenges such as the new industrial revolution, the digital economy, and changing patterns of international production. According to the World Investment Report 2019 (UNCTAD, 2019), China had 2,543 SEZs, followed by the Philippines (528), India (373), Türkiye (102), and Thailand (74). Among transition economies, Russia was a leading country with 130 SEZs, followed by North Macedonia (15), Serbia (14), Kazakhstan (10), and Kosovo (9). In total, there were nearly 5,400 zones across 147 countries. In May 2022, more than 7,000 SEZs in 145 countries, employing over 100 million people, launched the Global Alliance of Special Economic Zones (GASEZ), which seeks to drive the modernization of these zones across the world and maximize their contribution to the UN sustainable development goals (UNCTAD, 2022).

Following the dissolution of the Soviet Union, the countries of Central Asia (CA) experienced a substantial decline in output, hyperinflation, and high rates of unemployment. At the same time, a process of deindustrialization accelerated in the region and all existing production chains were disrupted. In the early 2000s, resource-rich countries of the region benefited from the resource boom and adopted several policies to support industrial development. SEZs became an important part of the region's industrial strategies. The Kyrgyz Republic was the first country in CA to create SEZ Naryn in 1991. It is worth noting that early attempts at SEZ establishment were taken in Soviet Kazakhstan, which adopted the law 'On free economic zones in the Kazakh SSR' dated 30 November 1990. According to the law, the free economic zone in the Kazakh SSR was a specially allocated territory with clearly defined administrative boundaries and a special legal regime, created to attract foreign capital, advanced foreign technology, and management experience for the accelerated socio-economic development of the zone (Adilet, 2023). Kazakhstan, the Kyrgyz Republic, and Uzbekistan created many SEZs aimed at economic diversification, export promotion, the attraction of FDI and MNCs, and the generation of highly skilled employment. These SEZs have different specializations and were targeted at sectoral growth. As of 2022, the number of SEZs in Kazakhstan was 13, in the Kyrgyz Republic five, and Uzbekistan 24.

At the same time, these countries actively follow the global trend of digitalization and are implementing national digital strategies, where digital SEZs play a key role. Kazakhstan's Astana Hub,

the Kyrgyz Republic's High-Tech Park (HTP), and Uzbekistan's IT-Park are technology hubs aimed at the development of innovation and technology companies, the digital transformation of the countries, and the increase in exports of IT products and services. These technology hubs have special regulations with lower taxes and favorable business privileges. Through SEZ preferences, the countries attract international technology companies, digital investments, and specialists. As a result, residents of SEZ participate in the implementation of national digital projects and contribute to the growth of IT services exports.

Hence, the objectives of this study are as follows: firstly, it reviews and reveals the major achievements of digitalization strategies; secondly, it analyzes the role of SEZs—such as Astana Hub, the High-Tech Park in Bishkek and the IT-Park in Tashkent—in the digital transformation of Kazakhstan, the Kyrgyz Republic, and Uzbekistan—highlighting the achievements and potential of these technology hubs; and thirdly, the study develops policy recommendations for the improvement of the capacities of the technology SEZs. The rest of the paper is structured as follows: section 2 describes the methodology and data sources; section 3 reviews the digital policies of Kazakhstan, the Kyrgyz Republic, and Uzbekistan and analyzes their major achievements and shortcomings; section 4 provides an overview of the global SEZ experience and its effects, reviews Central Asian policies, and analyzes the performance of the selected technology hubs; section 5 provides policy recommendations; and section 6 concludes.

Methodology and Data

The study uses desk research to analyze digital policies and programs in Kazakhstan, the Kyrgyz Republic, and Uzbekistan, to review global experience and analyze regulation. Comparative and statistical methods were applied to analyze the economic indicators of technology SEZs, such as production and trade. Finally, within the study, individual interviews were conducted with the senior management of Astana Hub and HTP through Zoom software. In particular, the author interviewed Zhansaya Kalybekova, Director of Participants Registration Office at Astana Hub, and Chubak Temirov, Deputy Director at HTP. During the interviews, the participants discussed the role of SEZ residents in the implementation of national digital projects, sources of financing SEZs, mandatory export requirements, Central Asian digital cooperation and competition, the contribution of relocated companies from Russia and Belarus to the growth of key SEZ indicators. The interview with IT-Park Uzbekistan took place in written form.

The paper uses data from the official websites of Astana Hub, HTP, and IT-Park; the media; international development reports; financial institutions—such as the World Bank; and academic publications. The SEZs also provided general and statistical information. International data sources include databases of the International Trade Center (ITC), UNCTAD, the World Intellectual Property Organization (WIPO), and the World Economic Forum (WEF). Moreover, the study uses data from national statistical agencies and the central banks of Kazakhstan, the Kyrgyz Republic, and Uzbekistan.

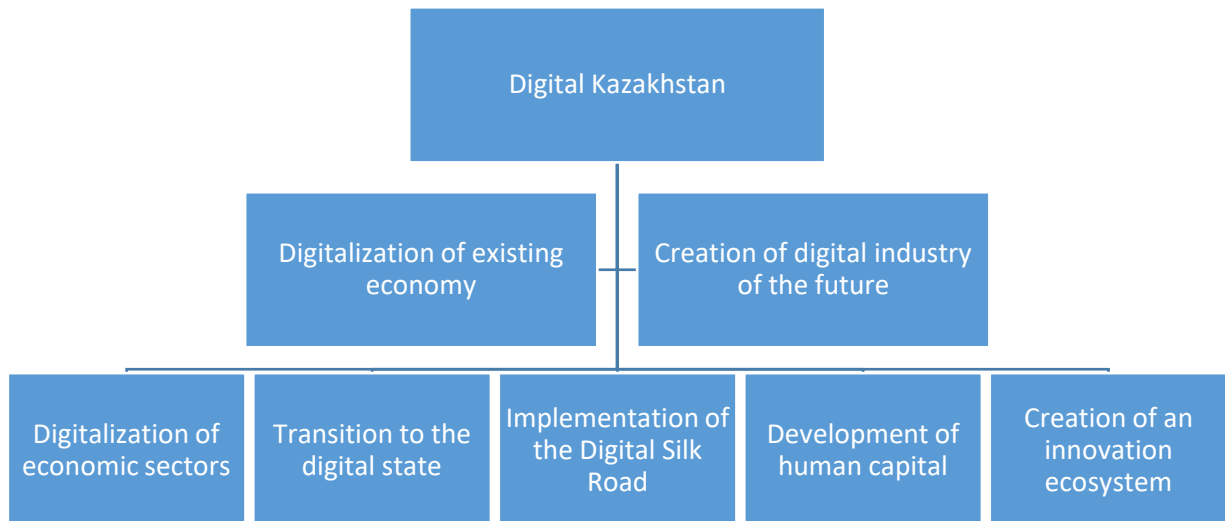
Review of Digital Policies of Central Asian Countries

Digital Kazakhstan

One of the key programs that aimed to develop and accelerate the digital transformation of Kazakhstan was Digital Kazakhstan 2018-2022. The goal was to accelerate the development of Kazakhstan's economy and improve quality of life for the population using digital technologies in the medium term. The program had 17 main tasks, which varied from sectoral digitalization (industry, agriculture, transport, and logistics) to the development of an innovation ecosystem (increasing and

improving digital literacy). The program focused on the development of technological entrepreneurship, startup culture, and research and development (R&D); the attraction of venture financing; and the formation of demand for innovation. Figure 1 shows two development vectors and the five main directions of implementation.

Figure 1. Implementing Digital Kazakhstan

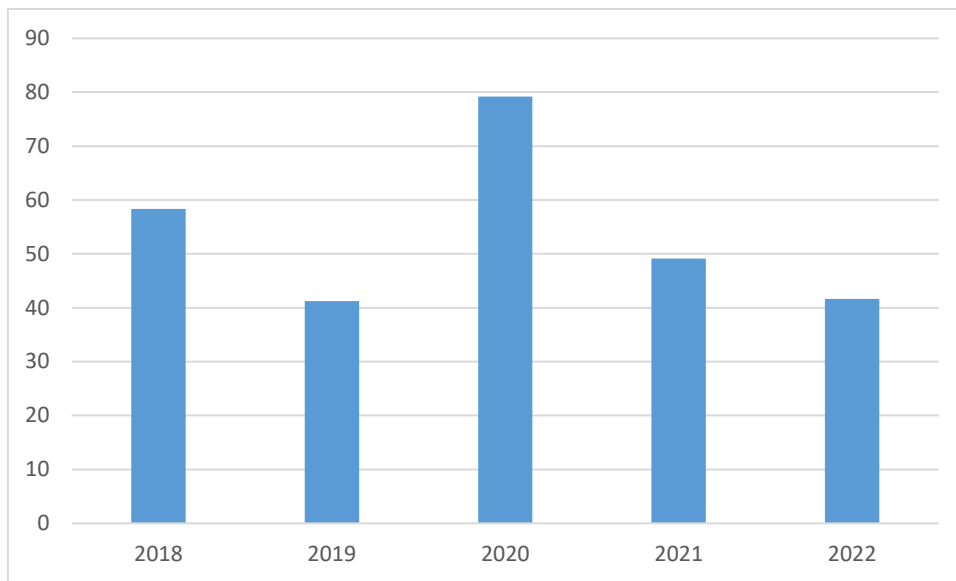


Source: Author compilation

Key program indicators included sectoral productivity and employment growth. For instance, it was expected that manufacturing labor productivity would increase by almost 50 percent. Through the program implementation, the government intended to create 300,000 jobs through digitalization and place Kazakhstan in the top 30 countries of the ICT development index. For the execution of the program, the government allocated USD269 million (Figure 2). According to preliminary estimates, the direct effect of digitalization of the economy by 2025 will be an increased value of 1.7 trillion tenge to 2.2 trillion tenge—thereby ensuring a return on investment of 4.8 to 6.4 times the total investment by 2025, taking into account private investment.

The program had significant potential to add value and reduce economic costs, achieving GDP at a compound annual growth rate of 4.5 percent to 5 percent from 2025—1.6 percent to 2.2 percent of which is thanks to digitalization.

Figure 2. Digital Kazakhstan budget, USD millions



Source: Author calculations

SEZs do not have a key role in Digital Kazakhstan. The program mentions these zones in only three places. Firstly, the Astana Hub is expected to have an impact on GDP. Secondly, the special economic zone ‘Park of Innovative Technologies’ (SEZ PIT) is predicted to accelerate the development and spread of electronic commerce. Hence, any issues will be resolved to increase production of goods and services. Thirdly, in comparison with other countries, there are very few technological startups in Kazakhstan; as a result, the independent cluster fund Tech Garden provided annual grants from USD20,000 to USD100,000.

Currently, according to official information source of the Prime Minister of Kazakhstan (2023), the government is implementing the national project ‘Technological breakthrough through digitalization, science, and innovation’ for 2021-2025. The purpose of the project is to improve public administration in Kazakhstan through digital transformation, making decisions based on reliable data, and increasing the contribution of science to the socio-economic development of the country.

Digital Kyrgyzstan

According to the National Development Strategy of the Kyrgyz Republic for 2018-2040 (2018), the country’s new economy will be based on the knowledge and initiative of a new generation of entrepreneurs. By 2040, the Kyrgyz Republic should become a digital hub on the Great Silk Road. A network of data processing centers of regional significance will provide ICT services to the entire region. Regional centers for introducing innovation in the digital economy and conducting applied R&D using modern technologies will stimulate the creation of new smart jobs.

Digital Kyrgyzstan 2019-2023 supports innovation and the digital transformation of the country. Priority tasks include the development of digital skills through the modernization of the system of higher and secondary (school) education, providing high-quality digital services, and creating new economic clusters. The digital transformation of business processes and production chains, participation in the digital agenda of the Eurasian Economic Union (EAEU) 2025 and the Belt and Road Initiative, and the reduction of barriers to the development of digital technologies will contribute to higher economic growth rates in the Kyrgyz Republic.

The government will therefore focus on the development of digital infrastructure and encourage internal R&D of companies and their participation in scientific and technological developments of the academic community. It will also develop partnerships both at national, regional, and international levels; attract international startups and foreign specialists; and improve the protection of intellectual property. Foreign specialists are technology transfer agents. The successful implementation of all these measures should improve the Kyrgyz Republic's international ranking in innovation.

Digital Kyrgyzstan mentions SEZs only once, when it claims that the High-Tech Park in Bishkek is a result of successful state innovation policy. Hence, the HTP can become a platform for dialog. The government plans to create an innovation cluster based on the HTP. The concept was financed within the limits of the funds provided in the Republican budget, donor funds, and private investments.

Digital Uzbekistan

The role of IT and innovations increased substantially in Uzbekistan following the country's new economic policy in 2017. On 5 October 2020, the presidential decree 'On approval of the strategy "Digital Uzbekistan 2030" and measures for its effective implementation' was issued. The strategy includes roadmaps for the digital transformation of Uzbekistan's economy and its regions. The country is implementing comprehensive measures to develop the digital economy, as well as the widespread introduction of modern ICT in all industries and areas, primarily in public administration, education, healthcare, and agriculture. Uzbekistan started the implementation of over 220 priority projects. The training of high-quality specialists is a top priority, and the country is implementing the One Million Coders megaproject. The government took measures to complete the digitalization of institutions of preschool education, healthcare, and secondary schools by the end of 2020.

The Ministry for Development of Information Technologies and Communications and its subordinate organizations will finance the digitalization processes using additional sources of local budgets. Since November 2020, the Ministry of Investments and Foreign Trade, together with the Ministry for Development of Information Technologies and Communications, should provide at least 5 percent of total investment project funds, as well as international financial institutions, foreign government financial organizations, and donor countries to digital components. Uzbekistan's foreign diplomatic missions will provide comprehensive practical assistance in the transfer of advanced technologies and IT solutions, attracting leading companies to jointly implement projects in the digital economy.

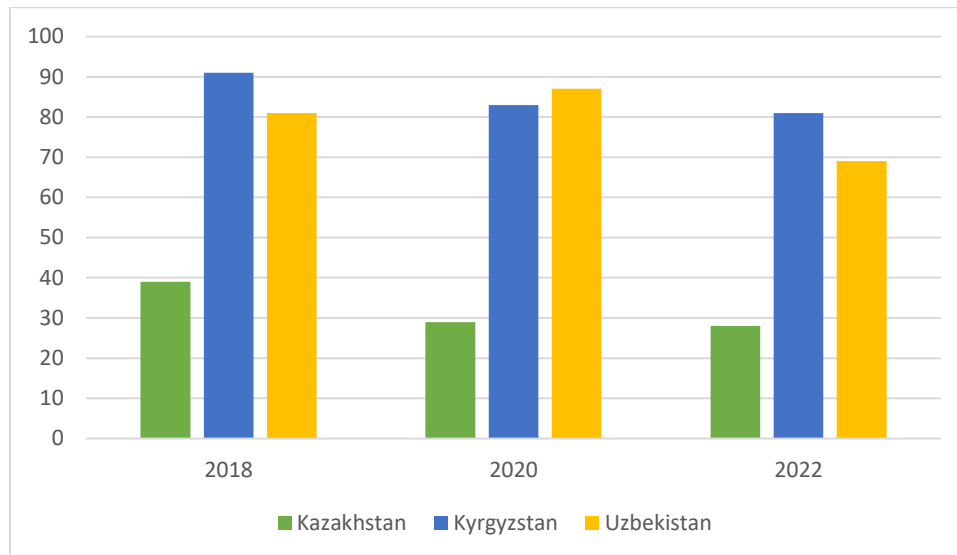
The strategy also focuses on the digital transformation of commercial banks by providing them with a wide range of online services. It considers the development of digital education by introducing a system of compensation for up to 50 percent of citizens' expenses for obtaining international IT certificates in system administration, and database and cloud platform management from 1 January 2021. Moreover, government measures included opening specialist schools in each district and city center with an in-depth study of computer science and IT. The government also supports fundamental and applied research in priority areas in the field of IT. Technology transfer is a priority for the authorities.

Digital strategy results and achievements in Central Asian countries

The implementation of the digital strategies contributed significantly to the improved global rankings of Central Asian countries (Figure 3). According to the United Nations (UN, 2018) E-Government Survey, Kazakhstan has the top E-Government Development Index (EGDI) score among the landlocked developing countries and is ranked 39th globally, owing to the 'Information

Kazakhstan 2020' program. The UN (2020) E-Government Survey reports that Kazakhstan has continued to accelerate the pace of e-government development within the framework of the Digital Kazakhstan program, the implementation of which has positively influenced ICT infrastructure. By 2020, the government had extended fiber-optic lines to 741 rural settlements (only 55 in 2018), and the number of people served jumped to 800,000 (from 100,000 in 2018). The government digitalized the transport and logistics sectors and introduced smart traffic systems (UN, 2022).

Figure 3. E-Government Development Index of Central Asian countries



Source: Author compilation based on UN data (2018, 2020, 2022)

In 2021, the Ministry of Digital Development, Innovation and Aerospace (2021) published an interim report for 2018-2020 on the implementation of the Digital Kazakhstan program. According to the report, many target indicators of the program were achieved. For 2018-2019, labor productivity growth exceeded target indicators. Authorities achieved targets on the share of e-commerce in total retail trade, electronic public services, the share of Internet users, and digital literacy. The executors partly achieved the goal of increasing innovation companies according to the Global Competitiveness Index of the World Economic Forum and attracted investment in startups. At the same time, the report provides no information regarding the number of created jobs in digital sectors. Forbes (2023) reported that in the first two years of Digital Kazakhstan, the overall economic effect was estimated at 802.5 billion tenge, 50,000 jobs were created, and 32.8 billion tenge of investments were attracted to the innovation ecosystem. Moreover, the authorities created 49 digital farms. The volume of computer programming, consulting, and other related services provided in Kazakhstan in 2022 amounted to 772 billion tenge compared to 646 billion in 2021. Of these, services for 2.6 billion people were provided in rural areas.

The Accounts Committee for Control over the Execution of the Republican Budget summed up the results of the state audit as an 'intermediate assessment of the implementation of the state program Digital Kazakhstan.' Besides noting the positive impact of the program, the accounts committee mentioned many problems. For instance, in the program action plan, in most cases (110 out of 125, or 88 percent), 'reporting information' was indicated as the form for completing activities. When using such a generalized formulation, there is no clear criterion to assess the degree of completion of the activity. Moreover, companies operating in the field of cryptocurrency mining and organizations with significant sales turnover were included in the number of participants in the Astana Hub. Those organizations obtained tax breaks, while failing to meet the goals and objectives of the Astana Hub (Supreme Audit Chamber, 2022).

The Kyrgyz Republic's position in the EGDI improved from 91st in 2018 to 81st in 2022. The country achieved these positive changes owing to the implementation of several important initiatives within its digital transformation strategy. The Kyrgyz Republic completed the transition of payment in trolleybuses to cashless payments. The government mandatorily introduced cash registers, which contribute to the fight against corruption. It should be noted that, for five months of 2022, the state tax service collected 60.8 billion soms of taxes and payments to the state budget; the plan was overfulfilled by 1.2 billion soms. Compared to the same period in 2021, the amount of taxes increased by 22.4 billion soms (Kabar, 2022). Another important achievement is a system of interdepartmental interaction 'Tunduk.' The program contains several important documents that Kyrgyzstanis can receive. In two months, almost 190,000 people downloaded the Tunduk app (Vesti.kg, 2023). More than 1 billion transactions have already been carried out through the Tunduk system. The number of registered participants in the system amounted to 204: 127 commercial organizations and 77 state bodies. The system currently provides 149 public services from 37 bodies, including 60 online services (24.kg, 2023a).

In 2022, the 'Digital Nomad' program was launched, granting special status to foreign citizens. In addition, 'Digital Documents' was launched in 2022; citizens of the Kyrgyz Republic will not need to carry passports, certificates, or other documents. The Meken-kart project to regulate the legal status of compatriots with foreign citizenship is already operational in test mode. In 2022, the government provided more than 1.7 million digital services in the Kyrgyz Republic (Economist.kg, 2022a).

One of the key partners of the Kyrgyz Republic to support digital initiatives is the European Union (EU), which financed the digital transformation in the Kyrgyz Republic to the tune of 2 million euros. The HTP of Bishkek participated in the implementation of the project (24.kg, 2022a). In November 2022, it was announced that the EU would allocate a further 3 million euros to the Kyrgyz Republic for digitalization processes (24.kg, 2022b). The grant was allocated to assist the work of the Innovative Digital Competence Center at the HTP (24.kg, 2022c). According to the Minister of Digital Development of the Kyrgyz Republic, Talantbek Imanov, the government completed the work on the preparation of the Digital Code. The Kyrgyz Republic is the first country in the world to develop such a document (24.kg, 2023b).

According to the Ministry of Digital Technologies of Uzbekistan, the Uzbek government successfully implemented reforms in the development of e-government. In the Open Data Inventory (ODIN) rating, Uzbekistan, with a score of 63 points, rose 125 positions to take 44th place in the world, becoming the leader in CA. EGDI of Uzbekistan also improved and in 2022 the country ranked 69th; it came 81st in 2018.

Training IT specialists is a key priority for the Uzbek government with the One Million Coders megaproject playing a key role. IT courses TechBika and ITWomen.Uz were developed to support girls and women.

Within the strategy Digital Uzbekistan 2030—which enabled the launch of more than 280 IT projects in all sectors of the economy—12 venture funds were instigated to finance startup projects; more than 40 startups raised over USD80 million from foreign investors and funds. 205 IT centers have been set up across all regions of the country, with more than 85,000 students already trained in them. Global companies—such as Microsoft, IBM, and Oracle—are present in Uzbekistan (Ministry of Digital Technologies of Uzbekistan, 2022).

Uzbekistan successfully completed the digital transformation processes (Table 1)—significant achievements of which include a substantial reduction of tariff costs for Internet services (external

channel) for providers from USD91.5 in 2017 to a low USD3 in 2022. It is noteworthy that this indicator was equal to USD423 in 2013.

Table 1. Digitalization indicators of Uzbekistan

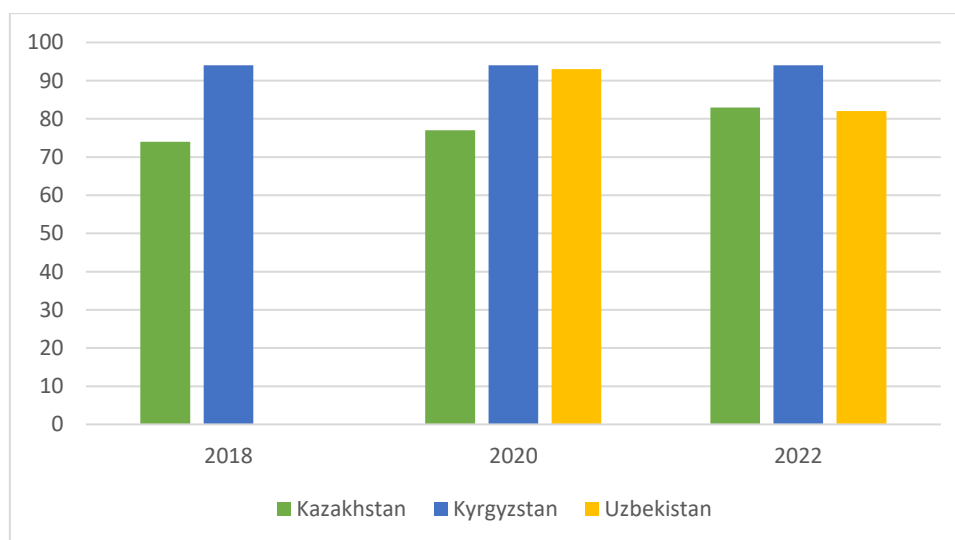
Indicator	2017	2020	2022
Bandwidth of international data network (Gbps)	64.2	1200	1800
Total number of Internet users (million)	14.7	22.5	27.2
The cost of tariffs for Internet services (external channel) for providers (USD)	91.5	5.5	3
Total length of fiber-optic communication lines (thousand km)	20.3	46.6	118
Number of mobile subscribers (million)	21.4	25.4	30.2
Number of mobile base stations (units)	19990	31740	49640
Digital television coverage (%)	95	100	100

Source: Author compilation based on data from the Ministry of Digital Technologies of Uzbekistan (2023)

Note: 2022 data for the number of mobile subscribers and the number of mobile base stations as of May 2022

According to the director of the Institute for Strategic and Interregional Studies, Eldor Aripov, Digital Uzbekistan 2030 involves several breakthrough measures for the country—such as, developing digital infrastructure and attracting investments worth almost USD500 million during 2020-2022 in the field of ITC (Review.uz, 2021). Uzbekistan plans a fivefold increase in its production of software products and a tenfold increase in exports—up to USD500 million (Khakimov, 2022). Measures implemented by the Government of Uzbekistan contributed to the improvement of the Global Innovation Index (GII) and transformed the country into a Central Asian leader (Figure 4).

Figure 4. Global Innovation Index of Central Asian countries



Source: Author compilation based on data from Cornell University, INSEAD, and WIPO (2018); Cornell University, INSEAD, and WIPO (2020); WIPO (2022)

In particular, the GII of Uzbekistan improved from 93rd in 2020 to 82nd in 2022. In the same period, Kazakhstan’s position worsened from 77th to 83rd, showing no progress in terms of GII. However, despite these changes, key indicators affecting innovation development remained depressed in the region. For instance, according to World Bank (2023) data, in 2021 R&D expenditure (as a percentage of GDP) in Kazakhstan amounted to 0.13 percent, in the Kyrgyz Republic 0.09 percent (in 2020), and in Uzbekistan 0.14 percent (in 2020). It is worth noting that in 2019, Uzbekistan's

indicator equaled 0.11 percent. At the same time, R&D expenditure for the world in 2020 amounted to 2.63 percent. Hence, attracting digital FDI should become a priority for regional governments (CAREC Institute, 2023). Thus, despite the positive changes from the implementation of digital strategies, the countries need to continue their efforts with digital transformation and the SEZs of the region can contribute positively to developing the innovation potential of CA.

Special Economic Zones in Central Asia

Overview of the global SEZ experience and its effects

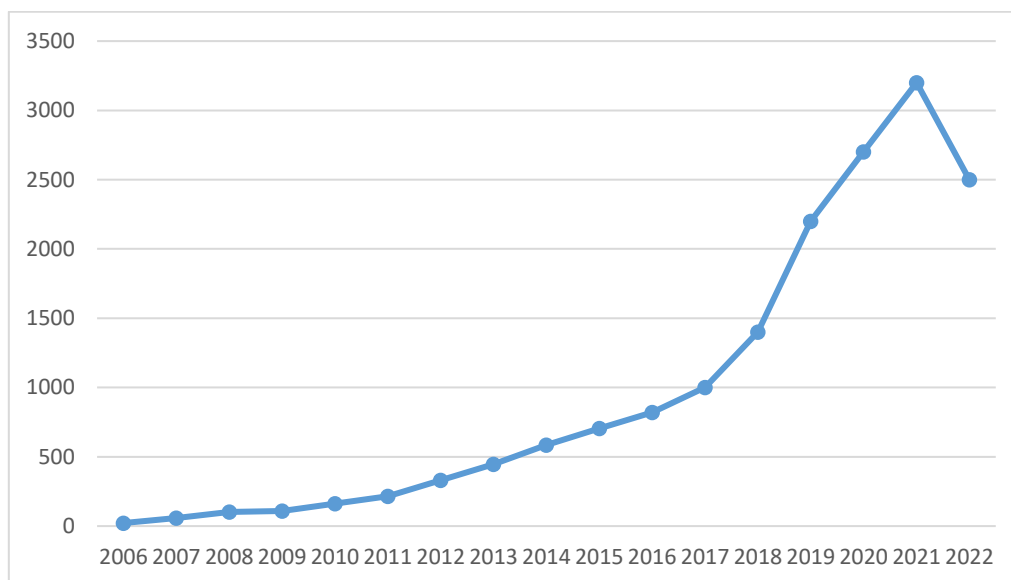
China's experience in establishing SEZs remains one of the most successful in the world. SEZs served as experiments for broader economic reforms and transformed the country into a world economic powerhouse. One of the well-known success stories is Shenzhen, where China implemented privatization reforms, permitted the entry of foreign banks, and established a stock exchange. Currently, Shenzhen is one of the leading global technology and innovation hubs (Yeung et al, 2009). China's SEZ policy package—including private property rights protection, tax breaks, and land use policy—on average increases per capita of foreign direct investment, which does not crowd out domestic investment. Most of the FDI attracted by SEZs is invested in new areas. The positive impacts of SEZs include an increase in total factor productivity and local workers' earnings (Wang, 2013). Establishing the SEZs had a positive effect on capital investment, employment, output, productivity, wages, and number of firms. Capital-intensive industries benefit more than labor-intensive ones from the zone programs (Lu et al, 2019). SEZs increase the number of applications for invention patents, utility model patents and design patents, and increase the number of citations of invention patents. High-tech SEZs have a larger impact on innovation than economic and technological SEZs, and national SEZs have a larger impact on innovation than provincial SEZs. SEZs promote innovation in existing technical fields and continuously expand new research fields (Wu et al, 2021). SEZs significantly increase the local high school enrollment rate and may generate long-term economic gains from the perspective of human capital investment (Lu et al, 2023). A new generation of Chinese leaders started a new wave of economic reforms using newly established SEZs, such as the China (Shanghai) Pilot Free Trade Zone (SPFTZ), which aims to explore new systems and measures that are transplantable to other parts of the country. The major tasks of the SPFTZ include opening new investment sectors, promoting a transformation of China's trade development approach, deepening innovation, and opening financial services. In the SPFTZ, financial, transportation, commerce and trade, professional, cultural and public services sectors will be enlarged and opened, and, in most sectors, market access restrictions will be suspended or canceled (Yao & Whalley, 2016).

However, there are many cases of unsuccessful implementation of SEZ policy. For instance, Angola spent at least USD1 billion establishing the Zona Económica Especial de Luanda-Bengo. The SEZ is located on more than 1.5 million hectares and aims to promote import-substituting industrialization. The SEZ's size, cost, and ambition certainly place it among Africa's most daring industrialization efforts to date. Nevertheless, the project is widely recognized as a massive failure, owing to a lack of technical knowledge in policymaking and assuring the distribution of resources to relevant constituencies (Lippolis, 2022). Africa is experiencing an unprecedented proliferation of SEZs. However, the performance of most African SEZs has fallen short of expectations, despite African zones relying to a greater extent than elsewhere in the developing world on fiscal incentives and establishment and performance requirements (Rodríguez-Pose et al, 2022). Panama's experience shows that SEZs may exacerbate inequality. All the industries supported in the SEZs have high barriers to entry in terms of both skills/education and capital requirements (Sigler, 2014).

Former socialist and post-Soviet countries establish SEZs for structural transformation. SEZs in transition economies result in an increase in government revenue and can bring structural change, but only in the geographic entity declared a special economic zone (Schweinberger, 2003). SEZs in Poland focused on combating unemployment and supporting the restructuring of the post-communist economy. From 1995 to 2017, firms located in the SEZs created 213,000 new jobs. In Poland, regional tax credits for companies operating in SEZs have a positive effect on fixed assets (Dugiel et al, 2022). The Russian government started to create SEZs to attract foreign investors with tax privileges in 2005. By 2020, 28 SEZs had been created in 18 Russian regions with industrial, technological, touristic and recreational, and logistic specializations. SEZ policy implementation has a significant and positive effect in Russia on firm productivity and firm revenues in the domestic market (Dubinina, 2023).

Belarus achieved significant progress in terms of SEZ development. The establishment of the High-Tech Park (HTP Minsk) transformed the country into a regional innovation hub. *The Wall Street Journal* marked the country as ‘the Silicon Valley of Eastern Europe’ (Razumovskaya, 2016). High-Tech Park gathers 122 R&D centers of foreign corporations. More than 35 percent of HTP residents are companies with foreign shares. Foreign direct investments in 2021 amounted to USD529.5 million. HTP comprises 4.8 percent of the GDP of Belarus. Over 2021 HTP residents provided more than 18,000 new jobs. Figure 5 shows the dynamics of exports of the HTP Minsk residents. The reduction in 2022 can be explained by political factors connected to the Russian invasion of Ukraine, which caused the relocation of many companies and specialists. In 2021, the exports of the Park residents were more than 30 percent of the total Belarusian export of services, and its foreign trade balance was plus USD2.8 billion (High-Tech Park of Belarus, 2023).

Figure 5. Exports of HTP of Belarus, million USD



Source: Author compilation based on Office Life (2023a) data

The net outflow of specialists from the Belarusian IT sector in January to November 2022 amounted to 15,000 people. In 2022, the IT sector of Belarus lost 1,360 people per month (*Office Life*, 2023b). Many companies from HTP Minsk migrated to Central Asian IT Parks. For instance, HTP in Bishkek registered more than 50 companies from Russia and Belarus; these export services and pay 1 percent to the HTP Bishkek and taxes to the country's budget (Economist.kg, 2022b).

Thus, adequate SEZ policies, a good industrial infrastructure, strategic location, and service provision within the SEZs attract investment. SEZ policies will not work in every context nor will copying the experiences of other countries guarantee success (Frick & Rodríguez-Pose, 2023). According to Zeng (2021), the success factors of SEZs include macroeconomic and political stability, low regulatory risk, clear objectives, long-term commitment, and a strong technical team with solid expertise. Policymakers should develop SEZs as an integral part of the long-term development strategy. SEZs need careful planning, design and management, and rigorous monitoring and evaluation systems. Policymakers need to identify target markets and stimulate private sector participation. Efficient public services, favorable business and living environments, and good connectivity also contribute to the success of SEZs. Isolation from the rest of the economy, poor infrastructure and management, political and macroeconomic instability, inconsistent policymaking and rent-seeking are failure factors of SEZs. As mentioned earlier, these factors caused the poor performance of Angola's Zona Económica Especial de Luanda-Bengo. Thus, as Moberg (2015) notes, in the right institutional context, SEZs tend to promote economic growth, while in the opposite conditions they can cause resource misallocation and rent-seeking.

Astana Hub of Kazakhstan

Special economic zones are part of the territory of Kazakhstan, where a special legal regime is in force, with all the necessary infrastructure for priority activities. There are 13 SEZs in Kazakhstan with different sectoral focuses, including chemistry, metallurgy, oil equipment, ICT, and R&D and mixed specialization. Special economic zones are important parts of the industrial policy of Kazakhstan. The government of Kazakhstan granted these zones tax benefits, invested in the development of their infrastructure, and provided preferential regimes in terms of imports. All SEZs have their specializations, which include the development of manufacturing, trade, and IT (Government of Kazakhstan, 2020). Many SEZs are being criticized for their inefficiencies.

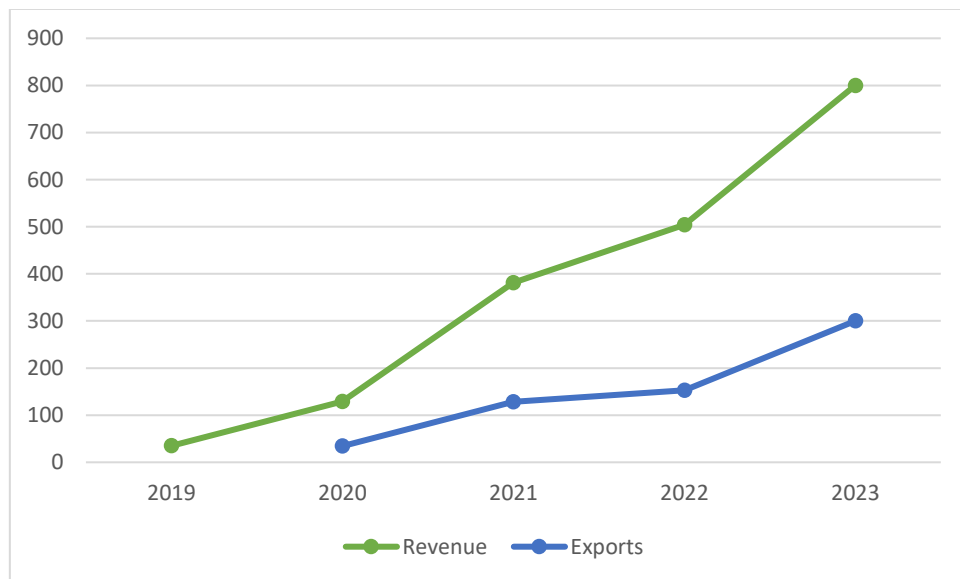
The President of Kazakhstan instructed the government to assess the effectiveness of all SEZs (Kapital, 2022). Following the instructions of the president, the government developed a roadmap to improve the efficiency of the SEZ. The authorities reported that the investment portfolio of domestic SEZs included about 315 implemented projects worth 1.2 trillion tenge with the creation of more than 21,000 jobs. Projects are presented in all basic sectors of the economy and aimed at the production of goods with high added value and product complexity (Prime Minister, 2022). An additional 256 projects worth 4.3 trillion tenge are under implementation with the creation of more than 24,000 jobs (Delovoy Kazakhstan, 2022).

Astana Hub is a key technology SEZ in Kazakhstan. Its mission is to become a center for the development of innovative projects, produce breakthrough IT companies, and attract a critical mass of young and talented IT specialists from all over the world. One of the main goals of the Hub is the export of IT services worth USD500 million by 2025; this was updated by the message of the president of Kazakhstan so that, by 2026, Astana Hub needs to increase exports of IT services to USD1 billion. Residents of Astana Hub receive significant tax preferences. These preferences exempt participants from taxes such as corporate income tax, VAT, VAT for non-residents, VAT on imports on a list of goods from third countries, royalty tax, and social tax for non-residents. Participation status allows companies to attract foreign workers and issue a work visa for them for up to five years instead of the standard three years. There is no quota for the number of foreign employees involved (Astana Hub, 2023).

Astana Hub's revenues increased from USD35 million in 2019 to USD504 million in 2022 (Figure 6). According to expectations, in 2023 the indicator will reach USD800 million. The Hub's exports grew

from USD34 million in 2022 to almost USD153 million in 2022. In 2023, the Hub’s forecasted exports may reach USD300 million.

Figure 6. Revenues and exports of Astana Hub, million USD



Source: Author compilation based on Astana Hub (2023a)

Note: data for 2023 are forecasts

Companies relocated from Belarus and Russia played an important role in the growth of Astana Hub’s revenues and exports. At the same time, Astana Hub’s own residents show substantial growth. It is important to mention that not all relocated companies closed their businesses in Russia and Belarus; they diversified their offices to continue working with international customers. EPAM Kazakhstan—operating in Kazakhstan’s market since 2008—became a resident of Astana Hub in 2022. In general, Astana Hub plans to continue actively attracting and localizing the largest international technology companies in Kazakhstan. As of July 2023, 1,213 companies operate in Astana Hub, 314 of them with foreign participation. More than 18,000 employees work in the companies of the technopark. Major employers include EPAM (1000+ employees), Netcracker (750+), MyTona (600+), BTS Digital (350+), and Playrix (300+).

Although one of the key objectives of Astana Hub is growth in exports of IT products and services, it does not have any mandatory export requirements for its residents. At the same time, it supports the export activities of its residents through export-oriented acceleration programs, such as *Scalerator* (for IT products) or *Global Outsourcer* (for IT services). According to Zhansaya Kalybekova, Director of Participants Registration Office at Astana Hub, market forces should drive the penetration of foreign markets by residents of Astana Hub without regulation. Companies that understand the limits of the internal market of Kazakhstan will search for new opportunities with the Hub's assistance. Astana Hub plans to launch differentiated support for residents based on the gamification principle, which means that company privileges will depend on performance. Companies will be rewarded for better results, including higher export volumes.

Different tax regimes for companies that work for the domestic market and mainly for export will probably not be achieved until 2029 when the first ten-year development cycle of the technopark will be completed. After that, the existing tax preferences should go to IT companies that make at least 70 percent to 80 percent of their revenue from exports. At this time, Astana Hub will not make

any changes so as not to appear inconsistent. Astana Hub needs to maintain the stability and predictability of working conditions in the technopark (Astana Hub, 2023a). Thus, residents of Astana Hub earn most of their revenue within the country and work and cooperate predominantly with Kazakhstan's private sector, while there are cases when they provide services and launch pilot projects with government bodies. Astana Hub uses the exterritoriality principle, which aims to attract companies from all regions of Kazakhstan.

Finance sources for the Astana hub include both the state budget and payments from residents. Resident companies allocate 1 percent of their revenues to Astana Hub, which uses these contributions (seed money) to launch and implement different programs to support startups, including the Hub's residents. Currently, more than 50 percent of Astana Hub's funding comes from resident companies. It is worth mentioning that, according to the strategy of Astana Hub, achieving self-sufficiency is one of the most important objectives. Astana Hub's priorities include the development of regional innovations and venture capital. Government support is needed to develop the venture capital market. A fully fledged, working 'fund of funds' focused on venture capital is needed (Astana Hub, 2023b).

Zhansaya Kalybekova mentions that international cooperation is one of the key priorities for Astana Hub. It closely cooperates with HTP Kyrgyzstan and IT-Park Uzbekistan by exchanging experience and information. Startups from the Kyrgyz Republic and Uzbekistan participate in Astana Hub's acceleration programs such as Silk Way Accelerator (with Google for startups) and Hero Training (with Draper University). Moreover, there is close digital cooperation within the Organization of Turkic States. Astana Hub does not consider its Central Asian partners as competitors. On the contrary, it intends to create a regional brand of innovations as the IT-Park and HTP can complement and strengthen the innovation potential of CA.

High-Technology Park of the Kyrgyz Republic

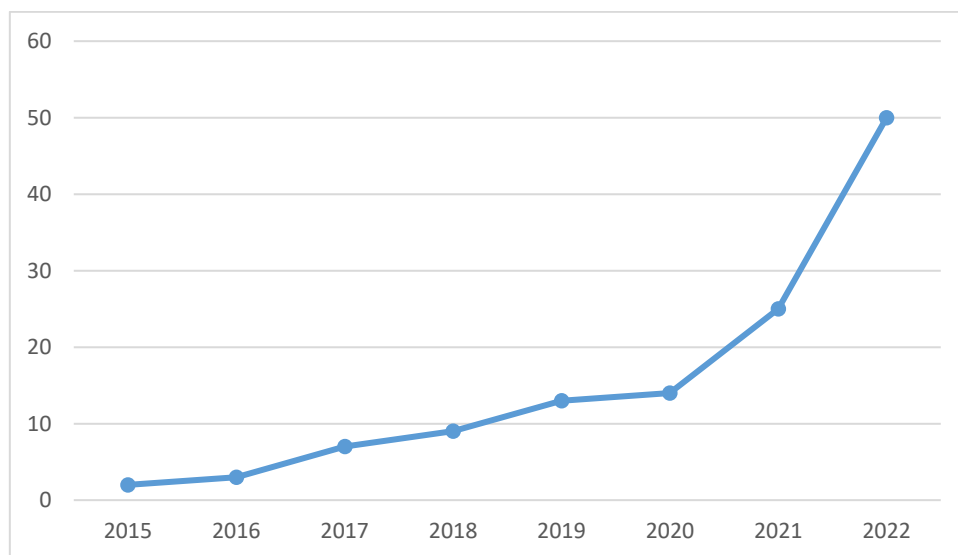
SEZs first appeared in the Kyrgyz Republic in 1991. The government created SEZs to improve the competitiveness of the economy and they were supposed to work mainly for export. One of the key conditions for the operation of an entity in SEZs was that 70 percent of goods produced should be exported to third countries. However, as the law 'On SEZ' was amended at least nine times, the paragraph about the precise proportions of export/import of goods was removed. The largest zone among the five SEZs in the Kyrgyz Republic is the Bishkek SEZ by the number of its active participants; it produces 99 percent of goods in money terms. Weak infrastructure is a key failure factor for SEZs in the Kyrgyz Republic (Ruslanova, 2020). Deputies of the Kyrgyz Republic's Parliament call to revise the tax and legal norms for the Bishkek SEZ and to give it greater independence in determining its policy and conducting economic affairs. It is worth noting that owing to the tightening of tax administration, the number of entities in the Bishkek SEZ has decreased from 1,215 to 300 (Economist.kg, 2022c).

The HTP started its work in 2012. In 2013, there were only three resident companies with a volume of exports of 11.8 million som (USD0.244 million). In 2022, HTP experienced the highest rate of growth in the number of residents, which equaled 67 companies in six months. At the end of 2022, the volume of revenues amounted to more than 4.2 billion soms—99 percent more than in the same period of the previous year (Figure 7). The salary fund grew by 141 percent. The new target for 2023 is to bring this figure to 8 billion soms. According to the 2022 report, growth is observed in all indicators of HTP resident activity. In total, 258 companies and individual entrepreneurs are currently registered. The main source of income was exports (92.4 percent), and the main activity was the development and implementation of software (70.2 percent). Most of the exports went to

the USA—32.21 percent. Russia was in second place (17.88 percent). To compare the figures for 2019, a sharp jump in exports to Türkiye was observed—5,291.7 percent (HTP, 2023).

According to the deputy director of the HTP, Chubak Temirov, the HTP is the first IT Park in CA, opened to help export-oriented IT companies penetrate foreign markets. The park’s slogan ‘to live in the Kyrgyz Republic and work with the whole world’ is a good description of its mission. Chubak Temirov mentioned that there was a strict requirement for membership in the HTP: 80 percent of the services must be exported. Therefore, most residents do not participate in digital projects in the Kyrgyz Republic. However, some resident companies participate actively in national digital projects, providing automation services to state bodies. The companies provide these services free of charge in the form of assistance. They also contribute to digital projects by providing consulting services. State companies implement national digital projects and are financed by the country’s budget. The government of the Kyrgyz Republic established the HTP, but its main source of financing is funds from resident companies. According to the regulations of HTP, each resident company must give 1 percent of its turnover to the HTP management. The park’s budget consists of these payments and is used for the operational costs of the HTP and the development of the ITC sector in the Kyrgyz Republic.

Figure 7. Annual aggregate revenue of HTP residents, USD



Source: Author compilation and calculations

HTP established close cooperation with the Astana Hub and IT-Park. The HTP representatives regularly visit the events of these partners. In 2022, the HTP initiated a reward ceremony (financial reward) for the best Central Asian IT companies, which was supported by Astana Hub and IT-Park. The best companies were sent to Silicon Valley, and the project was financed by the three parks. In 2022, the HTP organized the first CA forum with the support of all three parks at Cornell University in New York. The parks also cooperate within the Organization of Turkic Countries, with the participation of the IT parks of Türkiye and Azerbaijan. In 2022, the representatives of the three parks together with colleagues from Azerbaijan visited Türkiye to get familiar with the country’s IT infrastructure. Following the visit, HTP sent more than ten companies to Türkiye **to set up similar businesses**. The HTP does not consider other Central Asian SEZs to be competitors, as the region currently has a joint vision. Temirov accentuates that the region can attract Big Tech companies only by integration. At the same time, competition is inevitable at small company level.

Occasionally, Big Tech companies open branches in all CA SEZs. For instance, EPAM is a resident of the HTP, Astana Hub, and IT-Park of Tashkent at the same time. The shortage of specialists is one of the main reasons behind these Big Tech company decisions.

According to Temirov, the relocation of companies from Russia and Belarus was one of the factors that increased key indicators such as volume of services and exports. Expectations about the potential impact of these companies on the Kyrgyz Republic's IT sector are high. They can have a positive influence on R&D, education, and learning processes.

Chubak Temirov also indicated key problems of the HTP, including obscurity and marketing, sustainable regulation, stability, and support of the HTP at legislative level as there are some calls to increase taxes. A shortage of specialists is a key problem for the entire region. The HTP has set ambitious plans. By 2030, resident revenues should reach USD1 billion and HTP should train at least 50,000 IT specialists. To achieve the goals, the HTP will support existing residents and help them to penetrate new (US and European) markets, attract new companies using the favorable tax regime of the Kyrgyz Republic, and maintain annual double growth.

IT-Park of Uzbekistan

SEZs in Uzbekistan specialize in industry development, the pharmaceutical sector, tourism, and agriculture. In total, from 2008 to 2022, 604 projects worth USD3.2 billion were implemented in SEZ territories. To implement these projects, the country's SEZs attracted around USD896.9 million. About 55,000 new jobs were created. The largest projects were implemented in Angren SEZ (84 projects worth more than USD1 billion), Navoi SEZ (73 projects worth USD495 million), Urgut SEZ (77 projects worth USD335.9 million), and SEZ 'Kokand' (84 projects worth USD280.2 million). SEZ companies produced over 500 types of industrial product. In 2023, the implementation of 86 investment projects worth USD983.6 million was planned to create 128 new types of industrial product and 13,000 new jobs (Ministry of Investment, Industry and Trade of Uzbekistan, 2023).

In 2019, the government of Uzbekistan founded IT-Park under the Ministry of Digital Technologies for digital transformation purposes. Its mission was to promote the development of the IT industry in Uzbekistan and create a favorable environment for IT business. Objectives include the provision of IT-Park residents with the necessary infrastructure and support, including venture financing, and assisting residents to attract domestic and foreign investors. IT-Park contributes significantly to the development of digitalization in Uzbekistan. Its residents are actively involved in the implementation of software products in the public sector—namely public services, medical, agricultural, and transport. To optimize business processes, IT-Park residents develop websites, CRM/ERP systems, automation systems for personnel records, document management and accounting, as well as electronic queues, and platforms for receiving and processing applications from the public. Around 100 resident companies are involved in the provision of IT services in national projects. Thus, out of 1,407 companies, about 1,000 provide services to the domestic market. This number can constantly change, as foreign companies working mainly in the foreign market often adapt their products to the IT market of Uzbekistan. IT-Park was created on the principle of extraterritoriality within the territory of Uzbekistan. It is worth noting that most IT-Park residents work on the principle of extraterritoriality. The number of resident companies in Tashkent is 1,002 and 405 in the regions.

Activities of the IT-Park directorate are financed from the following sources:

- 1) Monthly contributions from IT-Park residents of 1 percent of total income
- 2) Income from the provision of services, as well as from the rental of real estate assigned to the directorate

- 3) Grants and loans from international financial organizations and institutions
- 4) Income received from venture financing of startup projects
- 5) The Fund for the Development of ICT and structural divisions of the Ministry of Digital Technologies of Uzbekistan

The launch of the IT-Park has had a positive and significant influence on the services sector of Uzbekistan. Table 2 shows the key indicators of IT-Park.

Table 2. Indicators of IT Park Uzbekistan

Indicator	2019	2020	2021	2022	January to June 2023	31 August 2023
Number of residents	369	411	523	1,122	1,424	1,407
Number of residents with foreign capital	15	14	23	156	213	221
Number of jobs	4,584	6,000	9,850	18,000	22,140	22,500
Volume of services (billion soums)	529.1	1042.6	2,542	5,836.3	5,396	6,200
Exports (million USD)	6.2	16.3	46	140.9	145.3	195
Number of exporters	48	59	104	352	442	479

Source: Data provided by IT-Park Uzbekistan

Data shows substantial growth in all indicators. In 2022, compared with 2019, the number of resident companies increased by more than three times, the number of residents with foreign capital more than ten times, and the number of jobs almost four times. At the same time, many companies were deprived of their resident status for failure to fulfill their obligations (UzDaily, 2023; Gazeta.uz, 2023). For the reported period, the volume of services surged by 11 times. IT-Park's contribution to service exports is also increasing. Exports of IT services grew by almost 23 times, while the number of exporters (companies from the USA, Germany, Korea, and CIS) increased by more than seven times. IT-Park residents export their products to the markets of the United States, Germany, Korea, the UAE and the Commonwealth of Independent States region. There are no mandatory export requirements.

International cooperation plays an important role in the development strategy of IT-Park. One of the key priorities of the IT-Park is to increase the attractiveness of CA for international IT business. To attract investors and develop the IT market in CA, IT-Park creates a platform containing detailed information about technology parks, infrastructure, services, and benefits provided to international investors in CA. IT-Park actively cooperates with other technology hubs in CA by participating in events and organizing joint programs, including within the framework of the Organization of Turkic States. IT-Park does not consider Astana Hub and HTP to be competitors. On the contrary, it supports regional cooperation and integration.

Another priority of IT-Park is attracting foreign specialists. It launches a special program to attract IT companies to Tashkent and relocate IT specialists with their families. The set of services includes visa support, arrangement of meetings with state or private companies, comfortable housing with all the necessary facilities, and the arrangement of kindergartens and schools for kids. IT companies are provided with quick and simplified company registration. All relocation services are provided to IT companies free of charge as a condition of registration as a resident of IT-Park (Ministry of Digital Technologies of Uzbekistan, 2022). Uzbekistan was the first country in CA to introduce a three-year IT visa, issued to IT specialists, IT-Park residents, and investors in IT projects. At the same time, the IT visa provides several advantages: the opportunity to obtain temporary registration for the duration

of the visa, the purchase of real estate of any value without restrictions, and the opportunity to receive medical and educational services on an equal basis with citizens of the Republic of Uzbekistan.

Uzbekistan and neighboring countries are faced with the problem of a lack of recognition and awareness of existing IT capabilities and the range of IT services and products in the country. However, IT-Park with partners from CA are actively working to resolve this situation by creating an IT brand for the entire region as a Central Asian technology hub.

Potential of Central Asian Technology Hubs

IT-focused SEZs of CA show promising results. Table 3 shows key indicators of Central Asian SEZs, while Table 4 compares their status. In 2020-2022, exports and resident numbers of technology hubs increased substantially.

Table 3. Indicators of CA SEZs

	2020	2021	2022
Astana Hub			
Exports, million USD	34.3	128.4	152.9
Residents	300	558	930
Exports per resident, million USD	0.11	0.23	0.16
Revenue, million USD	129	381	504
Revenue per resident, million USD	0.43	0.68	0.54
Kazakhstan's services exports, million USD	5,208.3	5,886.9	7,922.7
Share in total services exports, %	0.7	2.2	1.9
HTP			
Exports, million USD	13	23	46
Residents	73	97	258
Exports per resident, million USD	0.18	0.24	0.18
Revenue, million USD	14	25	50
Revenue per resident, million USD	0.19	0.26	0.19
the Kyrgyz Republic's services exports	428.2	521.8	1,271.3
Share in total services exports, %	3.0	4.4	3.6
IT-Park of Tashkent			
Exports, million USD	16.4	46	140
Residents	450	523	1,122
Exports per resident, million USD	0.04	0.09	0.12
Revenue, million USD	104	235	462
Revenue per resident, million USD	0.23	0.45	0.41
Uzbekistan's services exports	1,704.3	2,300.0	4,815.4
Share in total services exports, %	1.0	2.0	2.9

Source: Author compilation and calculations

As mentioned earlier, the relocation of IT companies from Russia and Belarus positively contributed to the growth of their indicators. Calculations show that in terms of exports per resident, the Kyrgyz Republic's HTP leads in the region. In 2022, exports per resident of the HTP amounted to USD0.18 million, while the indicators of Astana Hub and IT-Park correspondingly equaled USD0.16 million and

USD0.12 million. Revenue per resident is the highest in Astana Hub, while the HTP indicator is the lowest. HTP is the leading SEZ in CA in terms of contribution to the Kyrgyz Republic’s services exports. In 2022, the share of HTP in the Kyrgyz Republic’s services exports was equal to 3.6 percent, while the indicators of Astana Hub and IT-Park amounted to 1.9 percent and 2.9 percent, respectively.

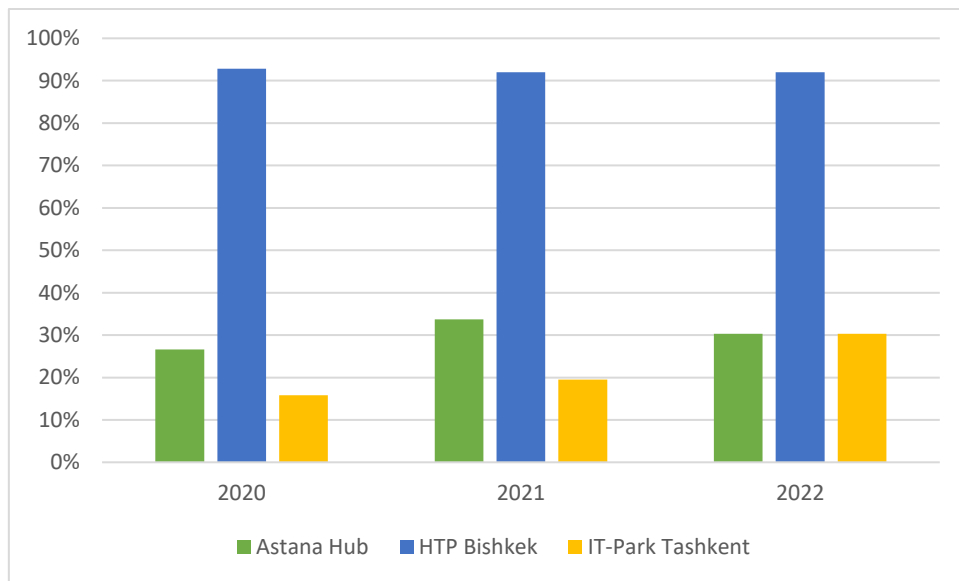
Table 4. Technology SEZs in Central Asia

	Astana Hub	HTP of the Kyrgyz Republic	IT-Park Uzbekistan
Year of establishment	2018	2012	2019
Role of state	Financial and legal support	Legal support	Financial and legal support
Exterritoriality	Yes	Yes	Yes
Sources of financing	State budget, 1 percent of resident revenues	1 percent of resident revenues	1 percent of resident revenues, state support, income from the provision of services, international grants and loans, venture financing revenues
Export requirements	No	80 percent	No
Regional cooperation	Joint events and projects, Organization of Turkic States	Joint events and projects, Organization of Turkic States	Joint events and projects, Organization of Turkic States
Regional competition	No	No	No
Participation in national digital projects	High	Moderate	High
Impact	Contribution to services exports, number of exporting firms, employment	Contribution to services exports, number of exporting firms, employment	Contribution to services exports, number of exporting firms, employment
Problems	Lack of specialists, lack of recognition of the Central Asian market, sustainable regulation	Lack of specialists, lack of recognition of the Central Asian market	Lack of specialists, lack of recognition of the Central Asian market

Source: Elaborated by the author

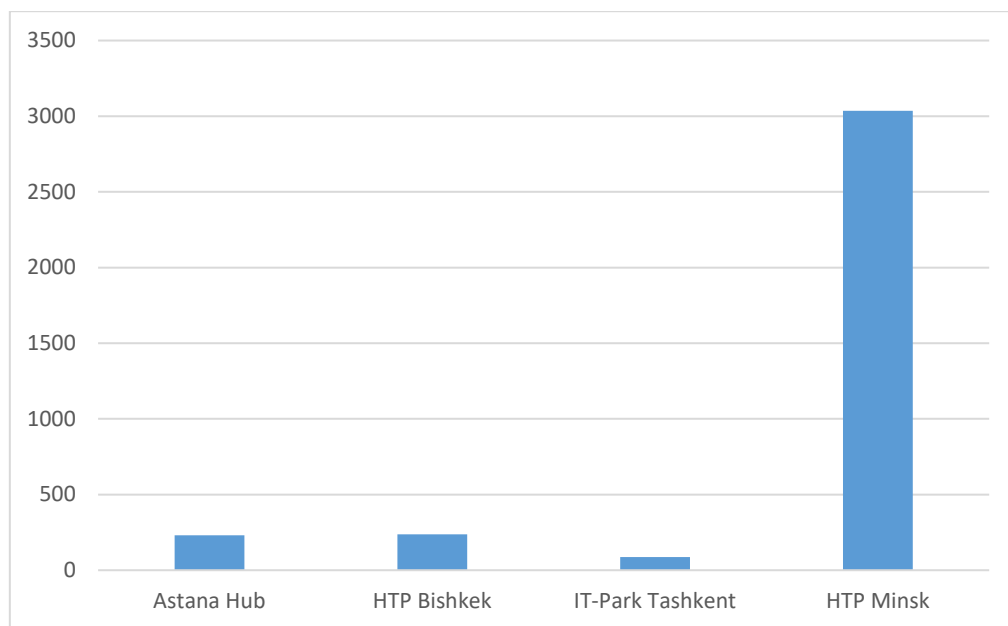
As Chubak Temirov mentioned, the key difference in HTP is its export orientation. Its share of exports in revenue exceeds 90 percent. In 2022, shares of Astana Hub and IT-Park of Tashkent were equal to 30 percent (Figure 8). Despite promising performances, these IT-focused SEZs trail far behind their global competitors, such as HTP Minsk (Figures 9 to 10). In 2021, exports per resident of HTP Minsk exceeded USD3 million, while its share in the exports of Belarus amounted to 31 percent.

Figure 8. Revenue share of exports



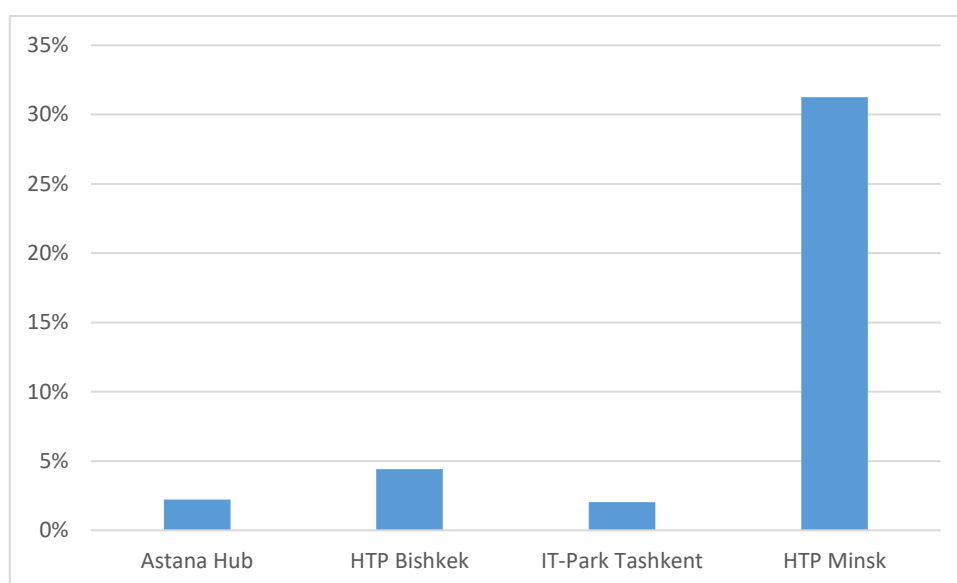
Source: Author compilation and calculations

Figure 9. Exports per resident, 2021, thousand USD



Source: Author compilation and calculations

Figure 10. Share in total services exports, 2021



Source: Author compilation and calculations

Thus, the technology hubs of CA have high growth potential. The contribution of the technology hubs in the development of the Central Asian services sector is increasing. Astana Hub, HTP and IT-Park participate in the implementation of national digital projects. Regional cooperation between the SEZs is also deepening and they use different platforms such as the Organization of Turkic States for the penetration of new markets and the implementation of joint projects. Efforts to create a Central Asian common market may attract international technology companies and digital investments.

Policy Recommendations

To improve their competitiveness, SEZs of CA should focus on the implementation of the following policy measures:

1. Kazakhstan, the Kyrgyz Republic, and Uzbekistan to align the development of Astana Hub, HTP, and IT-Park with the national development strategies.
2. Kazakhstan and Uzbekistan may consider the possibility of a gradual decrease in financial support to Astana Hub and IT-Park, as they can achieve self-sufficiency. These financial resources can be used for additional R&D support.
3. Kazakhstan and Uzbekistan need to develop measures to increase exports of the residents of Astana Hub and IT-Park.
4. The Kyrgyz Republic should provide sustainable regulation to HTP to maintain its attractiveness for both local and international technology companies. Calls for regulation changes may have a negative effect on private sector decisions.
5. Kazakhstan, the Kyrgyz Republic, and Uzbekistan need to strengthen policies to encourage cooperation between universities and technology hubs to train specialists.
6. Governments should develop an assessment methodology to estimate the efficiency of SEZs. They also need to develop indicators of efficiency, which should have a national impact.
7. Governments of the region need to substantially increase R&D investments based on IT-focused SEZs.

8. Procedures for selecting residents for SEZs should be clarified. It is important to assess the efficiency of the extraterritoriality principle, as companies should not use SEZs to evade taxation.
9. Future development policies of the technology hubs will need strict requirements such as a share of exports in total revenue.
10. Authorities should develop measures for the permanent localization of relocated companies as some of them consider CA to be a temporary location.
11. To attract MNCs and technology investments, countries of the region should accelerate digital integration in CA to present it as a single market with a well-trained workforce.
12. Governments of the region should provide openness and transparency in the work of SEZs. State funding and investments as well as the performance of SEZs should be regularly assessed, published, and available on their websites.

These policies may improve the competitiveness of the SEZs and positively contribute to the digitalization of CA.

Conclusion

Countries in CA are implementing digital transformation policies. Kazakhstan, the Kyrgyz Republic, and Uzbekistan adopted these policies to improve the competitiveness of their economies. They invest in digital infrastructure, train specialists, change regulation and educational policies, and start new digital initiatives. These policies resulted in substantial improvements in public services. The countries improved their positions in international rankings such as the EGDI of the UN. Uzbekistan made substantial progress in terms of innovation and became a Central Asian leader in terms of GII. Kazakhstan's innovation indicators worsened, while the Kyrgyz Republic demonstrated no progress. Digital initiatives, the development and attraction of startups, and increasing R&D can improve the region's innovation potential.

Special economic zones are important parts of the industrial and digital transformation of CA. Through the establishment of SEZs, the governments of the region aim to attract foreign direct investments, increase high-skilled employment, stimulate exports, form joint ventures with MNCs, and create new industries. Analysis of SEZ activity in CA shows significant differences in terms of their development. SEZs in Kazakhstan are being criticized for their inefficiencies. In the Kyrgyz Republic, only one in five SEZs functions, while SEZs in Uzbekistan remain important parts of industrial policy. The newly established IT-Park of Tashkent, HTP of Bishkek, and Astana Hub are important components of the digitalization of these countries. These IT-focused SEZs show promising results in terms of revenue and exports. The number of residents grew substantially, generating higher levels of employment. They could attract many foreign companies, including Big Tech, which can serve as sources of technological improvement in the region. Shares of these SEZs also increase in the total services of the countries. Residents of the SEZs participate in the implementation of national digital projects. The governments of the region in cooperation with the private sector need to support the activity of these SEZs by increasing R&D investments, training specialists, localizing foreign companies, and strengthening regional integration. These measures can improve the competitiveness of the SEZs and accelerate the digital transformation of CA.

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+86.991.8891151



km@carecinstitute.org | www.carecinstitute.org



21th Floor, Commercial Building Block 8, Vanke Metropolitan,
No. 66 Longteng Road, Shuimogou District,
Xinjiang Uygur Autonomous Region, the People's Republic of China , 830028