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## TRANSFORMATION OF THE ECONOMY IN THE DIGITAL ERA: EXPERIENCE OF UZBEKISTAN AND DEVELOPMENT STRATEGIES

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### ABSTRACT

This article examines the processes of transformation of the economy of Uzbekistan in the context of the digital era. The main focus is on analyzing the country's experience in the use of digital technologies and developing development strategies in a rapidly changing digital landscape. The study includes an analysis of key initiatives aimed at promoting digital transformation, such as developing digital infrastructure, introducing e-government, stimulating digital entrepreneurship and educational programs in the field of digital technologies. The author of the article also considers strategic directions of development, identifies successful practices and highlights the challenges facing Uzbekistan in the process of digital transformation, providing valuable recommendations for the further development of the economy in the digital age.

### KEYWORDS

Digital economy, economic transformation, digital era, development strategies, digital transformation, economic experience, innovation, digital technologies, e-government, development in the digital era, digital transformation, e-government, risk of cyber threats, digital literacy.

### INTRODUCTION

With the rapid development of technology and the transition to the digital age, countries around the world are actively implementing strategies to transform their economies. In this context, Uzbekistan does not stand aside and is taking decisive steps towards the digitalization of its economy. This process not only covers the introduction of new technologies in various sectors, but also includes changes in tax policies, preferential conditions for IT companies, and development strategies aimed at supporting innovation.

In this context, this study focuses on the experience of Uzbekistan in the field of digital transformation of the economy and identifying key development strategies. By analyzing successful initiatives such as exemptions from customs duties, reducing the tax burden for IT companies and the creation of privileged zones, we seek to understand what factors contribute to the successful integration of digital technologies into the economic sphere of Uzbekistan. In addition, key aspects of development strategies aimed at ensuring sustainable and innovative economic growth are discussed.

### Relevance of the topic

This study is aimed at identifying the best practices of Uzbekistan in the context of digital transformation and developing recommendations to improve the effectiveness of development strategies in the modern digital economy.

Since the entry into the digital era, radical changes have occurred in the structure and functioning of the economies of the world community. Electronic technologies, artificial intelligence, cloud computing and digital platforms have become an integral part of modern business and society as a whole.

In the context of Uzbekistan, the country is rapidly adapting to the demands of the digital era, implementing reforms and introducing innovations in various sectors of the economy. Active digitalization is supported by government strategies such as exemption from customs duties, benefits for IT companies and the creation of privileged zones.

In the context of an ever-changing global economic landscape and increasing dependence on digital technologies, studying the experience of Uzbekistan and its development strategies is not only of academic interest, but also of strategic importance. This study can serve as a basis for developing recommendations that will help not only Uzbekistan, but also other countries seeking to successfully adapt to the requirements of the digital economy and ensure sustainable development in the digital era.

Uzbekistan strives to take a strong place among advanced and developed countries, which is reflected in the active implementation of reforms in various sectors of the economy. The goal of these reforms is to create decent living conditions for the country's population. In recent years, Uzbekistan has achieved significant successes, which have received recognition

from the world community. These achievements testify to the country's commitment to modern development, and also emphasize the assertion of Uzbekistan on the world stage.

## Literature analysis

This article analyzes important aspects of the development of the digital economy in the context of legislation and regulations in the Republic of Uzbekistan. The main focus is on the constitutional rights of citizens to information and the implementation of decrees and resolutions of the President of the Republic, which are based on national legislation.

The article also analyzes data from Internet sources and scientific literature, which allows us to develop practical recommendations on the use of the information received. This approach allows us to take into account both theoretical and practical aspects of digitalization in the context of the Uzbek economy and ensure more efficient use of available resources.

In 2020, the Digital Uzbekistan 2030 strategy was adopted, which covers more than 220 priority projects [2020] [1]. This strategic direction indicates the serious efforts of the Government of Uzbekistan towards the digital transformation of the economy and society.

In addition, the work of a number of foreign economists was analyzed,

In the legislative practice of the Republic of Uzbekistan and other countries, the key technological aspects defining the digital economy include the following:

The Internet: As a basis for information exchange and communication between various economic entities. The Internet plays a key role in the development of the digital economy, providing access to information, resources and opportunities for online transactions.

Mobile and sensor networks: The inclusion of mobile devices and sensors in the digital infrastructure provides the ability to access data and manage processes in real time. This contributes to increased efficiency and improved user experience, as well as creates new opportunities for the development of mobile applications and services.

Knowledge and digital technologies: The main component of the digital economy is knowledge and skills related to the use of digital technologies. This includes educating the public in information technology, programming, data analytics and other skills needed to work in a digital environment.

These technological moments form the basis for the development of legislation and strategies for the development of the digital economy, as they provide the basis for the functioning and further development of digital markets, infrastructure and services.

Additionally, the reports of international organizations in the field of digital transformation of the world [2023] [2] are considered.

In the work of M.L. Kaluzhsky, the digital economy is defined as a sector of economic activity that is closely related to the use of the Internet. He examines the forms, methods, tools and communication

environment through which this activity is carried out. This concept highlights the importance of the Internet and digital technologies in the modern economy, as well as their impact on business processes and interaction between market participants. [2014] [3].

The study by L.V. Koch and Yu.V. Koch emphasizes the role of the information and communication technology (ICT) sector as a catalyst for the development of other sectors of the economy. They note that the digital ecosystem formed within the framework of ICT opens up wide prospects for innovation and the emergence of new business models. This helps to increase the dynamism of the economy and facilitates adaptation to changing conditions [2019] [4].

In the work of S. B. Ognivtsev, attention is drawn to the repeated use of the terms "digitalization" and "digital transformation" in the context of the formation of the digital economy. Some researchers do not make a clear distinction between these terms, considering them synonyms [2019] [5]. In this context, the concept of digitalization is associated with the development of new information technologies and is considered as a measurable indicator, while digital transformation covers a wider range of changes in business processes and society, including changes in culture, organizational structures and strategic approaches.

In our opinion, the digital economy is a human-oriented production complex that operates in a virtual environment and creates products and services, providing convenience and efficiency of production

using digital technologies. It is a system that can cover various aspects of life and production, including production, distribution, exchange and consumption. All these aspects can be formalized within the framework of the digital economy and expressed in logical schemes. Indeed, the digital economy opens up opportunities for the creation of new ideas and products, acting as an important environment for innovation and development.

### METHODOLOGY

Research government programs and strategies aimed at digital transformation. Highlight key strategies and methods used to stimulate innovation in the economy. Research government programs and strategies aimed at digital transformation.

Highlight key strategies and methods used to stimulate innovation in the economy. Analyze the experience of Uzbekistan in comparison with other countries that are successfully implementing digital transformation programs. Identify common features and unique features of the approaches of different countries.

Assess the impact of digital transformation on key economic indicators and social aspects in Uzbekistan. Consider changes in employment, the business environment and the level of innovation.

Develop specific recommendations for further steps in the digital transformation of Uzbekistan, taking into account identified successful practices and possible problems, as well as presentation of research results,

observation, data collection, data analysis, synthesis, comparisons.

## ANALYSIS AND RESULTS

In 2020, the Digital Uzbekistan 2030 strategy was adopted, which covers more than 220 priority projects. As part of this strategy, it is planned to improve the e-government system, further develop the domestic market of software products and information technologies. It is also planned to create IT parks in all regions of the republic and provide this industry with qualified personnel. These measures are aimed at strengthening Uzbekistan's position in the digital sphere and ensuring the country's sustainable development until 2030.

The effectiveness of recent digital reforms in Uzbekistan is clearly evident in the dynamics of international digitalization rankings:

According to the GovTech Quality Index, Uzbekistan ranked 43rd in the world in the public services sector, rising by 37 positions since 2020. The country entered Group A, including countries such as Brazil, the Republic of Korea and Saudi Arabia. According to the results of the UN e-government rating in 2022, Uzbekistan rose by 18 positions, becoming one of the countries with a "high/very high level of development". In the rating "Government Readiness Index for Artificial Intelligence", developed by Oxford Insights, Uzbekistan has risen from 158th to 79th place over the past 4 years. According to the Telecommunications Infrastructure Index (TII), Uzbekistan is recognized as

a country with a high level of TII and ranks 19th out of 220 countries in terms of the cost of broadband Internet.

These results indicate Uzbekistan's significant progress in the field of digitalization and confirm the country's desire for modern development in the digital age.

As part of the further improvement of the electronic government of Uzbekistan, key measures are envisaged aimed at improving the quality of public services provided and expanding the use of digital technologies:

Bringing the share of electronic public services to 100%, which indicates the desire for a complete transition to an electronic format in the provision of public services. The introduction of a Mobile ID identification system for a more convenient and secure provision of public services.

Implementation of the projects "Digital Passport of citizens" and "Digital Authority" aimed at improving the system of identification of citizens and management of public authorities.

Experimental implementation from July 15, 2022 to December 1, 2023 of a practice in which government agencies, banks and other organizations waive the requirement for paper identity cards. Instead, it provides for the presentation of digital versions of documents in a special One ID Mobile application that have legal force equal to their physical counterparts.



These steps are part of Uzbekistan's strategy to strengthen digital transformation and ensure more effective and convenient interaction of citizens with public services.

The e-Government Project Management Center, in cooperation with the Ministry for the Development of Information Technologies and Communications of the Republic of Uzbekistan, is actively working on the development and implementation of the Digital Passport of Citizens project. This project represents a key initiative aimed at improving the citizen identification system and introducing modern digital technologies into this process.

The purpose of this project is to create an electronic version of the passport, which will be legally binding and equal in importance to a traditional paper document. The introduction of a "Digital passport of citizens" will improve identification processes, providing citizens with ease of use and more effective interaction with government agencies.

This initiative also expresses Uzbekistan's desire for digital transformation and the introduction of innovative solutions in the field of public administration, which contributes to improving the efficiency and modernity of public services.

As part of the experiment, launched from July 15, 2022 to December 1, 2023, there has been a significant decrease in the requirements for paper identity cards in government institutions, banks and other organizations in Uzbekistan. Instead of traditional

documents, citizens can present digital versions in a special OneID Mobile application, which emphasizes the desire for digital transformation and modernization of the processes of interaction with government and commercial structures.

This step reflects the general trend in the use of digital technologies to simplify and improve the quality of public and commercial services. Digital versions of identity cards provided through the One ID Mobile application become legally equal to their physical counterparts, which opens up new opportunities for citizens and contributes to a more convenient and secure interaction with various organizations.

At the first stage of the implementation of the Digital Passport of Citizens project, it is planned to implement the system in the following areas:

Verification of documents for the right to use and drive motor vehicles: A digital passport can be used to identify owners and drivers of motor vehicles, as well as to verify their driving rights.

Domestic flights: Citizens can present a digital passport when checking in on domestic flights, ensuring the convenience and safety of air transportation.

Traveling by rail within the country: Using a digital passport will simplify the ticket registration process and provide passengers with additional opportunities for the convenience of traveling by rail.

Registration of guests in hotels, sanatoriums, holiday homes and other similar institutions: A digital passport can be used to verify the identity and registration of

guests in various entertainment and tourist establishments.

Obtaining the services of mobile operators and Internet service providers: A digital passport can serve as a means of identification when registering communication and Internet services.

Provision of public services in public service centers: The use of a digital passport will provide more convenient and efficient access to public services in various fields.

Provision of services to commercial banks and insurance companies: A digital passport can be in demand during banking and insurance operations, providing security and confirmation of the identity of customers.

Obtaining medical services: A digital passport can serve as a means of identifying patients and providing them with medical services.

Providing access to students in higher education systems: The use of a digital passport can facilitate the identification and interaction of students with higher education systems.

These areas cover various aspects of citizens' daily lives, providing them with convenience, security and efficiency when using a digital passport.

Integration into the digital document management service includes the ability to manage various digital documents, expanding functionality for users. In addition to basic documents such as a passport or an ID card of a citizen of the Republic of Uzbekistan, the

following digital documents are embedded in this service:

Driver's license: users can electronically manage their driver's licenses, possibly including status verification, information updates and other functions.

Vehicle registration certificate: the functionality of the service allows you to electronically manage data on registered vehicles.

Marriage and Birth certificates: Users can have access to digital copies of marriage certificates and birth certificates, as well as possibly perform other actions related to these documents.

Student ID: The ability to manage digital copies of student IDs, including status verification and information updates.

Coronavirus Vaccination Certificate: As part of current trends and relevance, users can have access to digital coronavirus vaccination certificates.

These capabilities provide citizens with greater flexibility and convenience in managing their digital documents, and also meet today's standards and needs for electronic interaction with government and commercial services.

According to the statistics agency, over the past five years the number of telecommunications and IT companies in Uzbekistan has increased by 1.8 times. In 2023, more than 12 thousand information and communication technology (ICT) enterprises operated in the republic. Over 100 thousand people are employed in this industry.

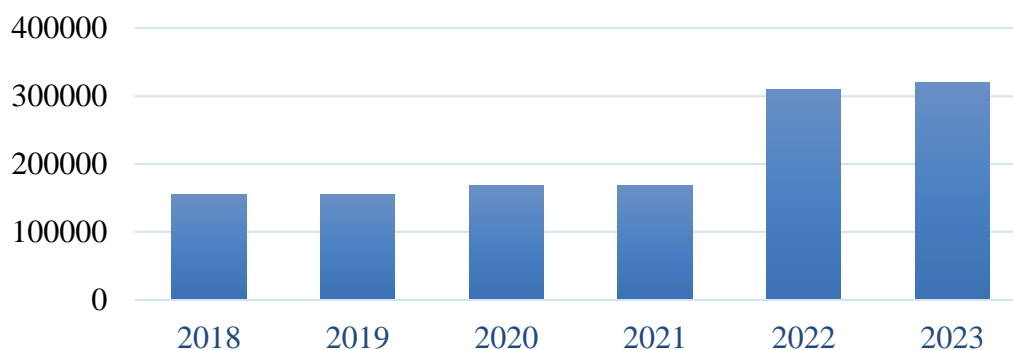


Fig. Export of digital services in Uzbekistan<sup>1</sup>

At the end of 2022, the volume of ICT services increased by 125.5% and amounted to 22.9 trillion soums. Of this amount, 4.2 trillion soums accounted for programming services provided by Uzbek companies and specialists. The total revenue of the IT sector of Uzbekistan for the first quarter of 2023 reached 2.38 trillion soums - this is almost four times more than in the same period of 2022. Exports of digital services also increased and amounted to \$57.2 million. According to IT Park, net income amounted to more than 90% of revenue or 2.158 trillion soums.

The policy of the government of Uzbekistan aimed at stimulating the development of the IT sector is very favorable. Exemption from customs duties on equipment, software and materials creates favorable conditions for IT companies, encouraging innovative and technological initiatives.

Reducing the excise tax on mobile communication services by up to 10% further contributes to the growth of the telecommunications industry, making communication services more accessible to the population.

Privileges for IT Park Uzbekistan residents create additional incentives for companies operating in the region, which can attract more investment and technological innovation.

Incentives for operators and providers developing infrastructure in remote areas help improve the availability of information technology in remote and underserved areas, which in turn can have a beneficial impact on the socio-economic development of these regions.

The overall picture speaks of the government's commitment to supporting and developing the IT sector, which contributes to technological progress

<sup>1</sup> Агентство статистики при президенте Республики Узбекистан, <https://stat.uz/uz/rasmiy-statistika/raqamli-iqtisodiyot>



and improved access to information resources in various parts of the country.

Now let's analyze the place occupied in the field of digital transformation of the economy of Uzbekistan in the world.

The 2023 Connected Readiness Index evaluates 134 economies based on various factors related to their readiness to take advantage of the digital revolution. In the current rankings, the US and Singapore maintain their high positions, occupying 1st and 2nd places respectively compared to the previous year.

Finland achieved significant success, moving up 4 positions to 3rd place after previously ranking 7th. The following lines are followed by the Netherlands and Sweden, occupying 4th and 5th places, respectively. These results demonstrate their high network readiness and effective use of digital technologies.

Top 10 NRIs 2023 highlight progress Economies in Europe, Americas, Asia and the Pacific lead the way in

network readiness. Specifically, among the top 25 countries, 16 are from Europe (mainly Northern and Western Europe), five are from East and Southeast Asia (including Singapore, the Republic of Korea, China, Hong Kong and Japan), and two are from Oceania. (Australia and New Zealand), and two from North America. (Canada and USA).

In order to determine Uzbekistan's place in the NRI (Network Readiness Index), employees of the state institution "Digital Economy Research Center" carried out research work.

On November 20, 2023, a new Network Readiness Index (NRI) report was presented, assessing the level of development of information and communication technologies and the network economy in various countries around the world. The index was created by the World Economic Forum in 2002 and, starting in 2019, is produced by the Portulans Institute, based in Washington.

Network Readiness Index (NRI) of the world's countries from 2019-2023.  
Table 1.

	2019	2020	2021	2022	2023
USA	8	8	4	1	1
Singapore	2	3	7	2	2
Finland	7	6	5	7	5
Russia	48	48	43	40	38
Kazakhstan	60	56	61	58	58
Uzbekistan	83	-	-	-	82
Kyrgyzstan	91	94	92	95	94
Tajikistan	99	109	111	111	113

Developed by the author based on the “Network Readiness Index 2023. Comparative analysis of the future of the network economy”

<https://networkreadinessindex.org/> [7].

The Networked Readiness Index (NRI) is a comprehensive indicator that assesses the level of development of information and communication technologies (ICT) and the network economy in the countries of the world. This index measures the level of ICT development according to 62 benchmarks grouped into four main groups:

**Technology:** Includes an assessment of the availability and prevalence of technological infrastructures, including broadband Internet, mobile communications and other technological resources.

**People:** assesses the level of education, digital literacy, skills and accessibility of educational resources in the country.

**Governance:** Includes an assessment of the effectiveness of government governance, digital services, private sector involvement and other aspects related to the management and regulation of the ICT sector.

**Impact:** assesses the impact of ICT on the economy and society, including innovation, business development, e-commerce accessibility and other aspects.

These four groups help to form a comprehensive picture of the country's readiness for the effective use and development of information and communication technologies.

In 2023, Uzbekistan was included in the rating of the Network Readiness Index for the first time. The 2019 report has a separate section dedicated to the republic, in which it is assumed that Uzbekistan could take the 83rd place. However, in the latest report for 2023, the country was ranked 82nd with a score of approximately 44 points. These changes may indicate some positive developments in the development of information technology and network readiness in Uzbekistan.

The state's score is calculated based on the indicators of four evaluation criteria:

- technologies ("access", "content", "technologies of the future");
- population ("individuals", "business", "government");
- management ("trust", "regulation", "engagement");
- influence ("economy", "quality of life", "contribution to the SDGs").

In 2023, Uzbekistan was included in the rating of the Network Readiness Index for the first time, taking 82nd place with a score of about 44 points. Our neighbors are also represented in this ranking and are listed below:

Kazakhstan took 58th place, Kyrgyzstan took 94th place, Tajikistan took 113th place, Comparing the data with the 2019 report, Kazakhstan improved its position from 60 to 58th place, Kyrgyzstan worsened its position from 91 to 94th place, Tajikistan also lowered its position from 99 to 113 places.

It is worth noting that Russia continues to improve its performance, ranking 38th. These data reflect the dynamics of information technology development in the region and make it possible to compare neighboring countries in terms of network readiness.

The USA, Singapore and Finland became the leaders in the NRI 2023 ranking. It is important to note that the United States continues to show steady growth, while Singapore and Finland show a high level of readiness to use modern practices and advanced technologies in information and communication technologies (ICT).

In the context of Uzbekistan, according to the available data for 2019 and 2023, there is an improvement in estimates in various areas, but also some drops. It is important to make a comparison to better understand trends. In 2019, Uzbekistan did not provide data on the criterion of "Technology", but in a subsequent report it ranked 67th in this category, which may indicate some progress.

Estimates based on the criteria of "Population", "Governance" and "Influence" can also reflect different dynamics of development within a country. An improvement in the population assessment may indicate an increase in education and digital literacy, while a decrease in the criteria of "Management" and "Influence" requires additional analysis to determine the causes and possible improvements in these areas. We will conduct a detailed analysis of Uzbekistan's assessments of various indicators in the Network Readiness Index (NRI) for 2019 and 2023. The grades

will be considered according to your criteria: values above the place of the regional leader (Kazakhstan) are considered good, and values below the place of Uzbekistan are considered unsatisfactory.

In addition to the analysis, let's look at some possible factors that may influence the change in the positions of these countries in the rankings:

Economic factors: the level of economic development, the investment climate and the level of corruption can have a significant impact on the ratings of countries.

Political stability and legal institutions: The quality of political institutions, the legal system and the protection of human rights can be key factors in the rankings.

Social and cultural aspects: the level of education, health and social development can also influence positions in the rankings.

Geopolitical factors: Geopolitical events, conflicts, or diplomatic relations can affect the international perception of a country.

Environmental and climate aspects: Sustainable development and measures to combat climate change can also be important factors for ratings.

Technological progress: innovative activity, the level of digitalization and access to information technologies can influence the positions of countries in the rankings. Analyzing these factors in the context of specific countries can help to better understand what is behind the changes in their positions in the rankings over time.

In 2023, Uzbekistan is showing improvements in access, engagement and quality of life, which is a positive development.

However, the field of content, individuals, business, regulation, economics, contribution to the SDGs and legal regulation require additional efforts, as assessments in these areas remain unsatisfactory.

It is especially important to pay attention to the drop in the indicator of contribution to the achievement of the Sustainable Development Goals from 43rd place in 2019 to 84th place in 2023. This analysis allows us to identify areas where Uzbekistan can focus efforts to improve its position in the ranking and develop information and communication technologies.

In Uzbekistan, the process of digital transformation is actively developing, attracting the attention of the government and the business community. Here are a few key aspects of this process:

**Digital Uzbekistan 2030 Strategy:** In 2020, the Digital Uzbekistan 2030 strategy was adopted, which covers more than 220 priority projects. This strategy is aimed at modernizing the country's economy through the use of modern digital technologies.

**Digital infrastructure development:** Uzbekistan is actively working to expand and modernize its digital infrastructure. This includes the deployment of broadband Internet, the development of digital payment systems and e-government.

**Support for startups and innovations:** The Uzbek authorities are taking steps to support young entrepreneurs and innovative projects. This includes the creation of incubators and accelerators for startups, as well as providing financial support and tax incentives for innovative companies.

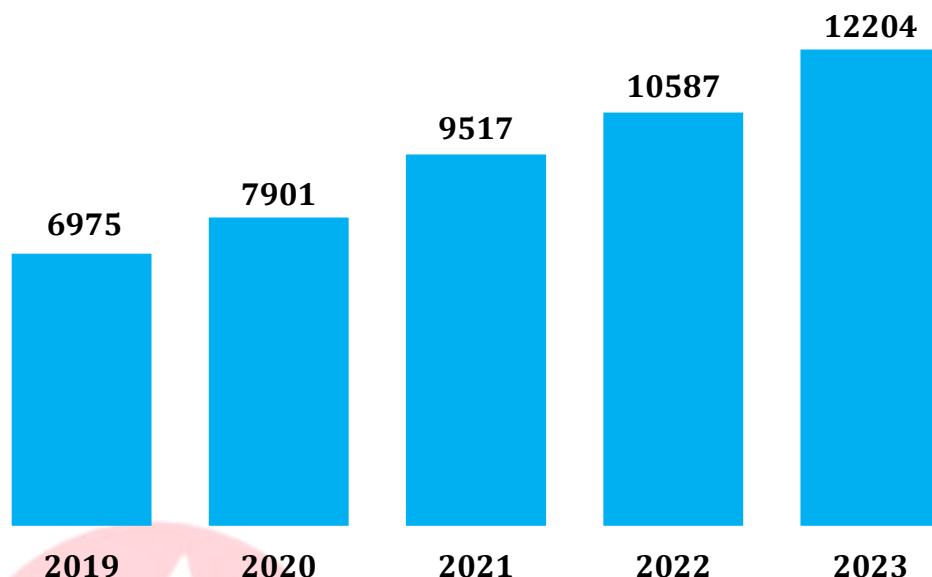
**Digital education and staff qualifications:** For a successful digital transformation of the country, it is important to have qualified specialists. Uzbekistan is taking steps to develop digital education and training in the field of information technology.

**E-government:** The digital transformation in Uzbekistan also includes the development of e-government, which allows citizens and entrepreneurs to interact with government agencies online, simplifying procedures and reducing bureaucracy.

These and other measures contribute to the development of the digital economy and ensure Uzbekistan's competitiveness in the global digital environment.

The data presented below shows how the number of operating enterprises and organizations in the field of information and communications has changed over the period from 2019 to 2023. It can be seen that the number of enterprises and organizations in this area is growing over time, Figure 1.

The number of operating enterprises and organizations by type of economic activity "Information and communication"



In 2019, 6,975 enterprises and organizations in this field were registered, and this number gradually increased every year. By 2020, the number increased to 7901, and by 2021 it reached 9517. Further, in 2022, 10587 enterprises and organizations were already registered, and in 2023 the number increased significantly to 12204.

This constant growth may indicate the rapid development of the information and communication sector during the period under review. This may be due to increased interest in digital technologies, the expansion of the market for communication services and information technology, as well as the creation of new enterprises in this area. This reflects the dynamic nature of the development of the information sector, which plays a key role in the modern economy.

## CONCLUSIONS

Economic transformation in the digital era is an important issue for many countries, including Uzbekistan. Digital transformation includes a wide range of changes associated with the use of information and communication technologies (ICT) to improve production, services, social processes and public administration.

Here are a few strategies that would help Uzbekistan in its digital transformation:

**ICT infrastructure:** Development of communications infrastructure, including broadband Internet access, mobile networks and digital platforms, is a top priority. This will provide the basis for the development of the digital economy.

**Education and training:** Creating training programs that focus on digital skills such as programming, data analytics, online marketing and ICT project



management will help prepare a workforce for the digital economy.

Fostering innovation: Supporting innovation and ICT start-ups through investment, tax incentives and incubation programs will help develop new technologies and business models.

Digital government: The introduction of e-government and digital government services will increase the efficiency of public administration, reduce bureaucracy and increase the level of citizens' trust in government.

Digital Security: Developing information security strategies and controls will help protect digital systems from cyber attacks and ensure the privacy of citizens and businesses.

Digital infrastructure for business: Supporting SMEs to use digital technologies to improve production, marketing and management can boost economic growth and help create new jobs.

Digital inclusion: Ensuring equal access to digital technologies for all segments of the population, including remote regions and disadvantaged groups, will help reduce the digital divide and ensure that everyone has the opportunity to participate in the digital economy.

These strategies can be adapted and modified to suit the specific needs and capabilities of Uzbekistan. It is also important to take into account the sociocultural and economic characteristics of the country when implementing digital transformation.

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