

PROBLEMS, MAIN DIRECTIONS AND PROSPECTS FOR THE DEVELOPMENT OF THE DIGITAL ECONOMY IN UZBEKISTAN

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Abstract

The scientific article “Problems, main directions and prospects for the development of the digital economy in Uzbekistan” explores the evolution of the digital economy in Uzbekistan, highlighting the key directions of this process. The measures taken by the government are considered, including the implementation of the National Concept of the Digital Economy and the “Digital Uzbekistan – 2030” strategy. Covers changes in the telecommunications industry, the level of public trust in digital services, and efforts to train qualified personnel in the field of digital technologies. The article also raises problems that slow down the digitalization process, such as uneven distribution of digital infrastructure, challenges in ensuring cybersecurity and others. Despite these challenges, the article highlights the potential of the digital economy to improve quality of life, increase productivity and create new business opportunities in Uzbekistan. The outlook includes deepening digital transformation in various sectors and supporting innovation to drive sustainable and dynamic development of the country.

Keywords: digital economy, investments, digital technologies, e-government, e-commerce, information and communication technologies (ICT)

Introduction

In an era of rapid technological changes and global transformations, the digital economy is becoming an integral component of the country's development, and Uzbekistan does not remain aloof from this global trend. In recent years, in an effort to modernize and strengthen its economic status, Uzbekistan has set a course for the active introduction of digital technologies in various areas of its activities. However, along with promises of promising development, faced with challenges and obstacles, Uzbekistan is faced with the need to solve a number of problems that are hindering the full flourishing of the digital economy in the country. In this article, we will pay attention to the key aspects of the development of the digital economy in Uzbekistan, identify obstacles on this path and consider the prospects opening up for the country in the context of digital transformation.

With the incredible speed of technological progress, Uzbekistan is striving to transform its economy through digital innovation. In 2018, President Shavkat Mirziyoyev in his address to Oliy The Majlis emphasized the importance of developing the National Concept of the Digital Economy, setting the country ambitious goals of modernizing all sectors of the economy using advanced digital technologies. Also notable is the launch of the strategic program "Digital Uzbekistan – 2030", which aims to double the share of digital services in the country's GDP and extensive development of digital infrastructure [4]. However, despite obvious efforts and determination in the field of digital modernization, Uzbekistan faces a number of problems slowing down this process. The uneven distribution of digital infrastructure and the persistence of the digital divide in telecommunications – these factors create inequality in access to digital resources, especially in the regional context. The insufficient level of public trust in digital documents and services, as well as their insufficient use in government agencies and the judicial system, calls into question the full effectiveness of the transition to electronic management and services. Another significant barrier is the shortage of qualified personnel in the field of digital technologies. The need to attract and retain talented IT specialists, as well as preventing the outflow of qualified personnel, is becoming a key aspect of successful digital transformation. Equally important is the issue of effective financing of projects in the field of digital technologies, as well as stimulating the attraction of private investment, especially in the regional context.

Methods and materials

To form the information base for the study, a thorough analysis of scientific articles and collections was carried out, such as "Uzbekistan: building a "digital economy"" - Khodiev B.Yu., "Legal basis for the formation of a digital economy in Uzbekistan" - Kobilov A.U., Tulaev M. .S., Razhabov Sh.B., Mamatkodiroya N.U., "Uzbekistan on the path to developing the digital economy" - Lazareva M.V. and Muhammadjonov S.A., "Development of the digital economy of the Republic of Uzbekistan" - Yuldasheva G.I. and Teshabayeva O.N., "Problems of digitalization of the regional economy in Uzbekistan" - Shatokhina S.Yu., "Activities of banks in Uzbekistan in modern conditions of the digital economy" - Bobokhuzhaev Sh., "Prospects for the development of the digital economy in Uzbekistan" -

Bazarov O. Sh. . and Tursunov I.E., Sharifbaev D.E., Sherov A.B. and Yunusov S.Yu, Zhurakulov Sh.B. dedicated to the study of the development of the digital economy in Uzbekistan. This stage of the research allowed us to cover the subject of study with maximum depth and relevance, relying on authoritative scientific research and the opinions of experts in the field of digital technologies. Additionally, to analyze the current state of the digital economy in Uzbekistan, the data provided by the Ministry of Digital Technologies of the Republic of Uzbekistan was carefully studied. This stage of the study became an integral part ensuring the accuracy and reliability of the information obtained. The results of such analysis have become an important tool for forming an objective picture of the current situation of the digital economy in the country. In addition to these research stages, strategic documents such as the “Digital Uzbekistan – 2030” strategy were studied in detail to analyze the prospects for the development of the digital economy in Uzbekistan. This made it possible to identify key areas and priorities that determine the future development of the digital economy in the country. In addition, the speeches of the President of the Republic of Uzbekistan, dedicated to improving the transformation of the economy, were analyzed in order to understand the country's top leadership sees the paths of development and the importance of digital transformation for society.

Results and discussions

The development of the digital economy in Uzbekistan is undoubtedly a complex and multifaceted process, and we will analyze it from different angles, paint a picture of the current state and propose ways to successfully overcome the problems standing in the way of the digital transformation of this country.

The digital economy is an economy in which digital technologies, information systems and data play a key role in the creation, distribution and use of material and intellectual values. It is characterized by the significant impact of digital innovation on business processes, social relations and economic models.



Fig.1 Development of the information and communication sector in Uzbekistan [7]

The digital economy in the Republic of Uzbekistan, as in many other countries, has gone through and is going through a number of stages of development. Having analyzed the data provided by the government and ministries of the Republic of Uzbekistan, we can highlight the following main directions for the development of the digital economy in the country:

1. Formation of infrastructure: to ensure digital development, it is necessary to create a modern telecommunications infrastructure, and in the period 2017-2022. A significant amount of work has been carried out in the republic to modernize and expand communication networks. For example :

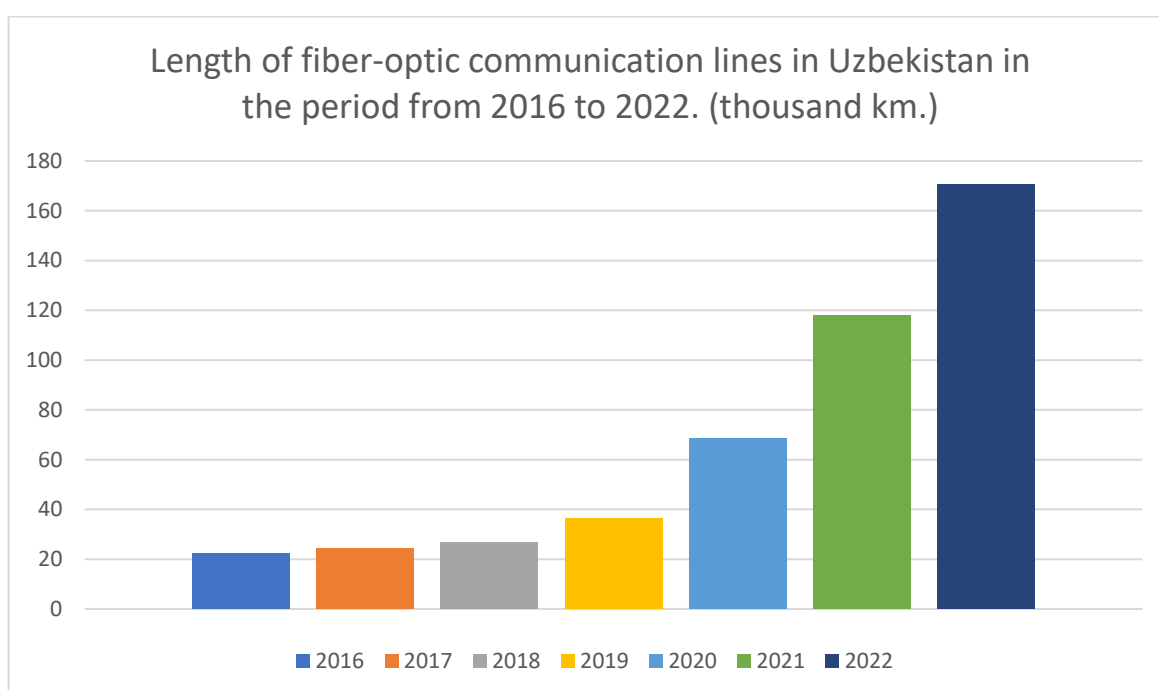


Fig.2 Length of fiber-optic communication lines in Uzbekistan in the period from 2016 to 2022.

In 2016, 22.1 thousand kilometers of fiber-optic cables were laid throughout the republic, but by the end of 2022, this number increased to 170.6 thousand kilometers. The availability of high-speed Internet connectivity is also increasing due to the deployment of broadband access ports. In 2016, less than 800 thousand ports were installed, but by the end of 2020 their number reached 3 million. This number is expected to increase to 5.8 million in the coming years. The development of fiber optic infrastructure also increases the capacity of communication channels. In 2016, the total bandwidth of Internet channels was only 64.2 Gbit/s, but by the end of 2020 it increased to 1200 Gbit/s. The goal was also to increase the total capacity of trunk communication channels between regions to 800 Gbit/s by 2023.

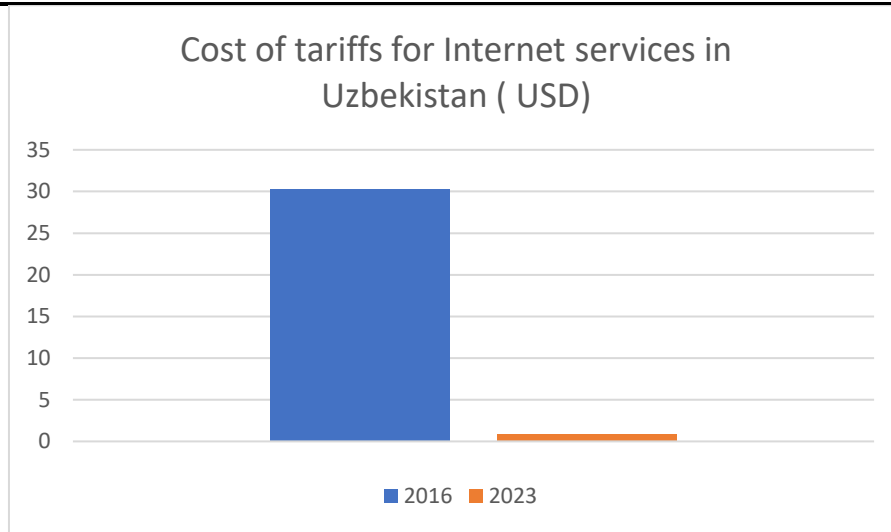


Fig.3 Cost of tariffs for Internet services in Uzbekistan

The gradual reduction in prices for communication services also plays an important role in increasing the availability of the Internet for the population. In recent years, the cost of tariffs for Internet services has decreased by 34 times, from 30.3 US dollars in 2016 to 0.88 dollars (10 thousand soums) in 2023 [8]. According to the rating of the British portal Cable . co . uk , Uzbekistan ranks 2nd among 218 countries with the most affordable Internet tariffs [9]. Particular attention is paid to providing high-speed Internet to social facilities as part of digital development. In 2021, according to data, the Ministry of Digital Technologies of the Republic of Uzbekistan, 97% of secondary schools, 82% of mahalla citizens' gatherings, 56% of police stations and 100% of preschool educational and medical institutions were connected to a high-speed Internet network. Mobile communications are also actively developing through the increase and modernization of base stations.

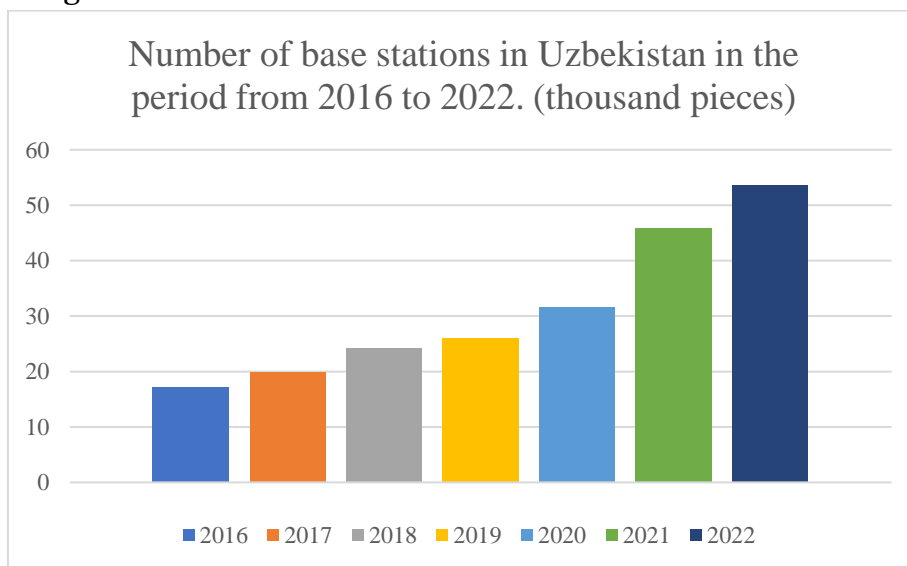


Fig.4. Number of cellular mobile communication base stations in Uzbekistan in the period from 2016 to 2022.

In 2016, the total number of base stations was 17.2 thousand, but by 2022 this number increased to 53.6 thousand. It is important to note that the development of mobile networks is currently carried out on the basis of 3 G / 4 G technologies, in contrast to the previously used 2 G technologies. Last year, 3.6 thousand base stations based on 3 G / 4 G technologies were modernized. In Uzbekistan, work is also underway to develop 5 G technology, and the company " U s ell " has already launched a fifth generation network in the business district of Tashkent - Tashkent City from April 2021. In the future, it is planned to deploy a 5 G network in regional centers.

The subscriber base of mobile operators is growing every year. The number of mobile users increased from 21.2 million in 2016 to 27 million in the first half of 2021. Of these, 23.1 million people use mobile Internet. The pace and volume of development of telecommunication networks is growing from year to year. Taking this into account, in October 2020, the Global enterprise was created in the Jizzakh free economic zone Optical Communication Uzbekistan (JV LLC " GOC - UZ ") together with partners from the Republic of Korea, which produces fiber-optic cable products with an annual capacity of 50 thousand kilometers. This will allow the republic to satisfy its own needs for fiber optic products and export them abroad. At the same time, the telecommunications infrastructure needs for resources for processing and storing data are growing. In 2020, a Data Center with a capacity of 5 petabytes was commissioned , and by the end of 2021, additional data centers with a total capacity of 25 petabytes were launched [8].

2. Development of e-government: The development of e-government in Uzbekistan is recognized as one of the key aspects of digital reforms, providing the opportunity to radically transform the work of public authorities and management. Ambitious changes in the e-government sector cover all areas of activity, with the active involvement of ministries and departments. An exclusive role in this process belongs to the Unified Portal of Interactive Government Services (EPIGU), which provides a wide range of services to the population. To date, more than 500 types of government services are provided through EPIGU . The strategy "Uzbekistan - 2030" sets a goal of entering the top 30 of the UN Electronic Government Rating, in the latest E - Government Rating Survey - 2022), published every two years by the UN, Uzbekistan has risen by 18 positions and now occupies 69th place [2, 6]. Digitalization of public services and the introduction of electronic government (e - government) improves citizens' access to public services, reduces bureaucratic barriers and increases the transparency of government agencies.

3. Development of digital infrastructure: in recent years, several programs have been developed and implemented in Uzbekistan to introduce digital platforms, including:

- The first digital platform for peer-reviewed scientific journals in Uzbekistan called " Uzbekistan " Research Online ."
- Huawei Digital Platform Enterprise .

- A new digital platform "U- Report " to attract youth, launched in Uzbekistan with the participation of UNICEF, the Youth Union of Uzbekistan, and the Oliy Senate Majlis and the Ministry of Public Education of the Republic of Uzbekistan, with the support of the cellular company Ucell and others.

The next and one of the key aspects contributing to the growth of the digital economy is e-commerce. In 2022, the e-commerce market in Uzbekistan reached 311 million US dollars. This result is 5 times higher than the 2018 figure, which confirms Uzbekistan's position as the fastest growing e-commerce market in Central Asia [5].

4. Support for innovative projects and start-ups : Uzbekistan also pays special attention to innovation and start-up projects, and evidence of this can be considered that by 2021, the amount of annual funds allocated from the State budget for the innovation and scientific spheres has increased by 3 times and increased to 1.5 trillion soums [5].

In the strategy for innovative development of the Republic of Uzbekistan for 2022-2026, it was established that state-owned enterprises will contribute before 10% arrived before paying taxes in Funds for supporting innovation activities. This money will be used for development and implementation "breakthrough" innovations [3].

5. Education and training: One of the most important areas of digital development in Uzbekistan is the education of highly qualified IT personnel. The Ministry for the Development of Information Technologies and Communications is carrying out large-scale work in this direction too.



Fig.5. Information about the project "One Million Programmers" [9]

The first and important condition is the creation of a comprehensive system of continuous training of IT specialists within the framework of school, secondary specialized and higher education. One of the most significant projects for training IT specialists is the megaproject "One Million Programmers" (One Million Uzbek Coders), implemented by the Ministry of ICT together with the foundation « Dubai Future Foundation " (UAE). The main goal of the megaproject is widespread distance learning of the population and youth in current IT specialties [2].

6. International cooperation: Uzbekistan also actively cooperates with international organizations and other countries to exchange experience and resources in the field of digital economy:

- UN (United Nations): Uzbekistan actively cooperates with various UN agencies such as the United Nations Economic Commission for Europe (UNECE) and the United Nations Development Program (UNDP) to develop the digital economy and digital technologies.
 - World Bank: within the framework of World Bank projects, research and development is carried out in the field of the digital economy, and programs are being implemented to digitally modernize the economy and improve the business climate.
 - Asian Development Bank (ADB): Uzbekistan is collaborating with the Asian Development Bank to support projects in the field of digital technologies and the development of information infrastructure.
 - European Bank for Reconstruction and Development (EBRD): The EBRD also provides financial and technical support to Uzbekistan in various sectors, including the digital economy.
 - SCO (Shanghai Cooperation Organization): Uzbekistan participates in cooperation within the SCO on issues of the digital economy and information security.
- Collaboration with these organizations and other international partners is helping Uzbekistan develop its digital economy, improve access to digital technologies and promote innovation in the country.

The development of the digital economy in Uzbekistan opens up new horizons for the country and promises many positive changes, influencing various aspects of public life. First of all, this process is associated with the expected economic growth, stimulated by increased productivity, innovation and the creation of new jobs. These factors, in turn, can have a significant impact on the overall economic indicator of Uzbekistan, creating favorable conditions for sustainable development. Compared to the traditional economy, the digital economy is characterized by high technology and skill intensity, which stimulates the introduction of new ways of working in various sectors. Increasing the efficiency of production processes, optimizing logistics and introducing intelligent management systems create favorable conditions for production growth and increasing the country's competitiveness on the world stage. One of the significant positive aspects of the development of the digital economy is improving the population's access to various services. Healthcare, education, financial services and government services are becoming more

accessible through the use of digital technologies. Electronic health records, remote learning, digital financial platforms, and online government are reducing barriers and making these services more convenient and accessible to citizens [1].

Governance efficiency is another important area where the digital economy brings significant benefits. The introduction of digital technologies makes it possible to reduce bureaucratic procedures and increase transparency and openness of the activities of government bodies. The introduction of e-government helps to optimize processes, reduce time to complete administrative procedures and improve the quality of public services for citizens and businesses.

Reducing barriers to entrepreneurship is another noticeable advantage of the development of the digital economy. Simplification of business registration procedures, creation of electronic platforms for interaction with the state and the introduction of digital technologies in accounting and tax accounting contribute to the development of small and medium-sized businesses. These changes create conditions for the emergence of new enterprises, promote the growth of entrepreneurial activity and improve the business climate in the country [1].

Increasing financial inclusion is another aspect that deserves attention. Digital financial technologies such as mobile payments and digital wallets have the potential to radically change the financial services landscape in the country. They increase the accessibility of financial services for all segments of the population, including those who previously remained outside the banking system. It promotes financial inclusion by providing people with tools to manage their finances and providing them with greater financial autonomy [2, 16].

The main goal of developing the digital economy in Uzbekistan is, of course, improving the quality of life of the population. Modern technologies are designed to provide citizens with more opportunities and convenience. The opportunity to receive high-quality medical services in remote regions, access to higher education through online platforms, quick and convenient access to government services - all this creates a new standard of living based on the use of modern digital technologies. However, despite the many positive aspects associated with the development of the digital economy, it is important to recognize both the potential challenges and risks that may arise during this transition. Cybersecurity is becoming one of the main issues. As the use of digital technology increases, so does the level of cybercrime threats. Data breaches, theft of personal information, and cyber attacks on critical systems can pose a serious challenge to the stability of the digital economy [20].

The current state of the digital economy in Uzbekistan shows significant potential for growth and development, but there are a number of serious obstacles slowing down this process. Among the main barriers hindering the development of the digital economy, a number of key problems can be identified that require a systematic and integrated approach to solve them. The first and perhaps one of the most significant barriers is the uneven distribution of digital infrastructure. In Uzbekistan, a digital divide remains in the telecommunications sector, which makes it difficult for the population and business in the regions to access

modern technologies. The lack of uniform coverage of high-speed Internet and modern communication networks creates unequal conditions for the development of digital innovation. This is a critical factor given that access to high-speed internet and modern technology is the foundation for successful participation in the digital economy.

The second significant barrier is the insufficient level of public trust in digital documents and services. Issues of data security, transparency of processes and protection of personal information remain relevant for most citizens and entrepreneurs. The lack of trust is also reflected in the limited use of digital technologies in government and the judiciary. Developing mechanisms and infrastructure to ensure the security of digital data and electronic transactions becomes an urgent task to remove this barrier [18].

The third barrier is the lack of qualified specialists in the field of digital technologies. Despite significant interest in training in this area, there is an outflow of qualified personnel. This is due, in particular, to the lack of competitiveness of wages and career opportunities within the country. To attract and retain highly qualified specialists, measures are needed to stimulate the development of the IT industry, including creating conditions for innovation and promising projects [19].

The fourth barrier is ineffective government financing of projects in the field of digital technologies and the lack of mechanisms to stimulate the attraction of private investment. Insufficient financing of venture funds to support innovative projects of digital transformation of the economy in the country; in practice, in many developed countries with a digital economy, their capital of venture funds amounts to over 10 percent of the country's GDP. Government support for digital innovation should not only be sufficient, but also effective, taking into account the specifics of different regions of the country. It is important to develop mechanisms that would promote active interaction between the state, business and educational institutions in the digital sphere [17].

December 28, 2018 became an important starting point for the development of the digital economy in Uzbekistan, when the President of the Republic of Uzbekistan, Sh.M. Mirziyoyev, put forward the idea of the National Concept of the Digital Economy. In his address to Oliy Majlis, he emphasized the need to modernize all sectors of the economy using digital technologies, calling for the creation of a digital future for the country. This statement was the key moment that launched the development strategy called “Digital Uzbekistan - 2030” [4].

The “Digital Uzbekistan – 2030” strategy became the foundation for the digital transformation of the country and laid the foundation for achieving a number of strategic goals. One of the key objectives is to double the share of digital services in the country's GDP, which indicates a desire to increase the influence of the digital economy on overall economic activity. Active expansion of infrastructure is planned, including the launch of three large new data centers in various cities of the country. This will provide the reliable and powerful data storage needed to support digital development. One of the important objectives of the program is also to provide access to the Internet at a speed of at least 10 Mbit/s for all households. The expansion of the telecommunications network and the modernization of

mobile communications will provide citizens and businesses with faster and more stable access to the network, which will significantly improve the conditions for the development of digital business projects, e-commerce and other digital initiatives.

The healthcare sector is becoming one of the priority areas of digitalization. The introduction of digital technologies in the medical field will optimize the processes of providing medical services, increase the efficiency of diagnosis and treatment, and improve the exchange of medical information. This will create a more efficient healthcare system, which is critical to ensuring the health of the nation and improving overall well-being.

Significant development is also expected in the banking sector. The introduction of digital financial technologies will improve access to financial services, reduce barriers to entrepreneurship and investment, and increase the level of financial literacy among the population. Creating a modern, flexible and secure financial infrastructure contributes to business development and attracting investment.

The introduction of modern agricultural technologies in agriculture is another important direction in the development of the digital economy. Uzbekistan can significantly benefit from the use of digital innovations in resource management, increasing production efficiency and ensuring food security. Monitoring systems, process automation and the introduction of modern management methods will help increase the yield and quality of agricultural products.

One of the key aspects of the successful implementation of the Digital Uzbekistan 2030 strategy is strengthening cybersecurity and ensuring data protection in the digital economy. As the use of digital technologies increases, so does the level of cybersecurity threats. Effective measures to protect data, cyber infrastructure and personal information are becoming an integral part of the digital economy development strategy. This also helps to increase public trust in digital services and encourages their active use.

Particular attention within the program is paid to the training of IT specialists. The launch of educational programs aimed at training qualified personnel in the field of digital technologies is a strategic step. Training in new skills and technologies not only supports the workforce needs of the digital economy, but also creates conditions for the sustainable development of the IT sector in the country. To stimulate innovation and development of the IT sector, benefits are provided for IT companies. The extraterritoriality of benefits allows companies in IT parks to enjoy privileges such as low income tax rates, no corporate and social taxes, and exemption from customs duties when importing goods and services. This creates favorable conditions for the development of the IT industry and attracting investment in this sector. The main emphasis within the framework of the “Digital Uzbekistan – 2030” strategy is on the involvement of private business with an innovative approach in the development of the digital economy. This is a strategically important area, since the active participation of private companies contributes to faster innovation, the creation of competitive products and services, and also stimulates economic growth [2].

The digital economy of Uzbekistan is experiencing rapid development, and its future promises to be even more dynamic. These steps to introduce modern digital technologies in

various areas, from government and education to healthcare and business, show the country on the path to a digital future. However, to achieve the full potential of the digital economy, Uzbekistan needs to continue to invest in education, innovation and cybersecurity. Startup support is becoming a key tool for stimulating innovation and developing new technologies. Policies to actively support innovation and entrepreneurship should create favorable conditions for the emergence of new players in the market and provide them with the opportunity to realize their ideas. An important element of successful implementation of the strategy is also the development of digital infrastructure. Improving the availability of high-speed Internet, creating modern telecommunications networks and deploying data centers - all these measures are necessary to ensure stable and efficient operation of the digital economy. Additionally, it is important to continue strengthening cybersecurity. As the volume of digital data increases and its importance to the economy and society, protecting against cyber threats becomes a strategic priority. Education and training of cybersecurity specialists, development and implementation of modern security technologies, as well as cooperation with international partners in this area are becoming key activities.

The digital economy of Uzbekistan represents a promising prospect for the country and its citizens. With strong government support and private sector engagement, Uzbekistan can lead the digital revolution in Central Asia, opening up new opportunities for growth, innovation and prosperity.

Conclusion

In conclusion of the article about the directions, problems and prospects for the development of the digital economy in Uzbekistan, it is necessary to emphasize the significance of this important strategic direction for the future of the country. Uzbekistan, having set a course for digital transformation, is experiencing key stages of its economic development, designed to improve the quality of life of citizens and strengthen the country's competitiveness on the world stage.

Paying special attention to the development of digital infrastructure can be considered one of the main positive directions for achieving and forming a digital economy in the country. But despite the positive indicators, there are also unique limitations and problems for the full digitalization of the country's economy. One of these problems can be considered cyber threats and data security, as well as low public trust in digital things. Barriers to the development of the country's digital transformation can also include a shortage of personnel in the field of IT and the drain of personnel abroad due to low wages.

The development of the digital economy in Uzbekistan is considered promising: continued funding to ensure cybersecurity of data and the entire digital ecosystem of the country, continued support for young IT specialists and funding for their innovative ideas and projects. By 2030, it is planned to double the share of e-commerce in the country's GDP and create a new digital infrastructure. The launch of new data centers, the modernization of telecommunications, the digitalization of healthcare and the banking sector - all these

measures are aimed at improving the quality of services provided and increasing the level of comfort for citizens.

Uzbekistan, having chosen the path of digital transformation, opens up new prospects for its future. At the same time, it is necessary to realize that the successful development of the digital economy requires not only technological innovation, but also an integrated approach to solving social, educational and legal issues. The future of Uzbekistan as a modern, sustainable and competitive country on a global scale depends on the intersectoral, balanced and consistent implementation of digital technologies.

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