# PROBLEMS IN THE FIELD OF INFORMATION TECHNOLOGIES AND SYSTEMS IN UZBEKISTAN AND PROSPECTS FOR THE DEVELOPMENT OF THIS SECTOR

*Jamshedova Mohinur Faxriddin qizi*
*Graduate student of the University of World Economy and Diplomacy*

**Abstract:** This article explores the current problems in the field of information technologies in Uzbekistan, the current state of this field, prospects for development, alternate proposals and solutions to the problems, as well as the analysis of information technologies as one of the factors of the economic development of the field.

**Key words:** infrastructure, government support, social development, economic growth, incentives

**Introduction:** Information technology (IT) is an essential aspect of modern society and has transformed the way we live and work. Uzbekistan, like many other countries, has embraced information technology, but it faces several challenges that limit its development.

Today, the sphere of information technologies and systems are one of the fastest growing in the global economy, being both an engine of economic growth and a sector that has already significantly changed and transformed economic processes in other sectors and continues to influence the formation of a new type of economy based on knowledge, use of information and products of human intellectual labor.

**Literature analysis:** One of the primary challenges facing Uzbekistan's IT sector is *inadequate infrastructure*. The country lacks the necessary infrastructure to support the growth of the IT sector, such as a reliable power supply, high-speed internet connectivity, and adequate data centres. This infrastructure gap has contributed to poor internet penetration, limited access to digital services, and the low level of technology adoption by businesses and individuals.

Another challenge is the *lack of skilled professionals* in the IT sector. Despite having some of the region's best universities, Uzbekistan struggles to retain its graduates and attract skilled professionals. As a result, the country has a shortage of qualified IT specialists, which limits the growth of the industry.

The third problem is the *lack of government support* for the IT sector. While the government has recognized the importance of the IT sector, it has not provided the necessary support to foster its growth. For instance, there are no incentives for businesses to invest in the IT sector, and there are no tax breaks or other benefits for IT companies.

**Table 1. General information about the Internet access in Uzbekistan[1]**

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|---|---|
| General speed of access to international networks (Mbps) | 145 500 |
| Total number of Internet users (million) | 26,74 |
| The cost of tariffs for Internet services (external channel) for providers (USD) | 30,2 |
| Total length of fiber-optic communication lines (thousand km) | 22.35 |
| Number of mobile subscribers (million) | 31,84 |
| Number of mobile base stations (pcs) | 22 178 |
| Total number of EDS keys (thousand pieces) | 1 928 094 |
| Number of types of services at the SPSI (pcs.) | 302 |
| Digital television coverage (%) | 100 |

To address these problems, Uzbekistan needs to *invest in its IT* infrastructure. The government should prioritize infrastructure development, including the expansion of high-speed internet connectivity and the establishment of data centres. This would enable businesses to access digital services and technologies, and facilitate innovation and growth in the IT sector.

Secondly, the government should *provide support for IT education and training programs*. The government can work with universities and training centres to develop IT education programs that focus on producing highly skilled IT professionals. Additionally, the government can introduce incentives for IT professionals, such as tax breaks or grants, to encourage them to stay in the country and contribute to the growth of the industry.

Finally, the government should provide *support for IT businesses*. This can be achieved through the introduction of tax breaks, grants, and other incentives to encourage

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[1] Digital 2023 Uzbekistan: https://www.slideshare.net/slideshow/digital-2023-uzbekistan-february-2023-v01/255842541?from_search=0#1

businesses to invest in the IT sector. The government can also facilitate collaboration between IT businesses and other industries to promote the development of new digital services and technologies.

*Problems:*

**1. Lack of investment:** The IT industry in Uzbekistan is still in its early stages and requires significant investment to grow and compete with other countries in the region.

**2. Limited access to funding**: Many IT startups in Uzbekistan struggle to secure funding due to a lack of venture capital firms and angel investors.

**3. Limited market size:** The domestic market for IT products and services in Uzbekistan is relatively small, which limits the growth potential for local companies.

**4. Limited infrastructure**: The IT infrastructure in Uzbekistan is still developing, which can make it difficult for companies to operate efficiently and effectively.

Analysis of the current situation in the ICT sector of the economy of the Uzbekistan.[2]

**Research methodology:** In this article, comparative comparison, systematic, statistical contests, grouping, comparison, induction, deduction, optimization methods and methods, technologies and special programs for the development of information systems were widely used.

**Analysis and results:** The IT industry in Uzbekistan is currently experiencing significant growth and development. The government has recognized the potential of the sector and has implemented various initiatives to support its growth. One of the key initiatives is the establishment of the "Digital Uzbekistan" program, which aims to develop the country's digital infrastructure and promote the growth of the IT industry.
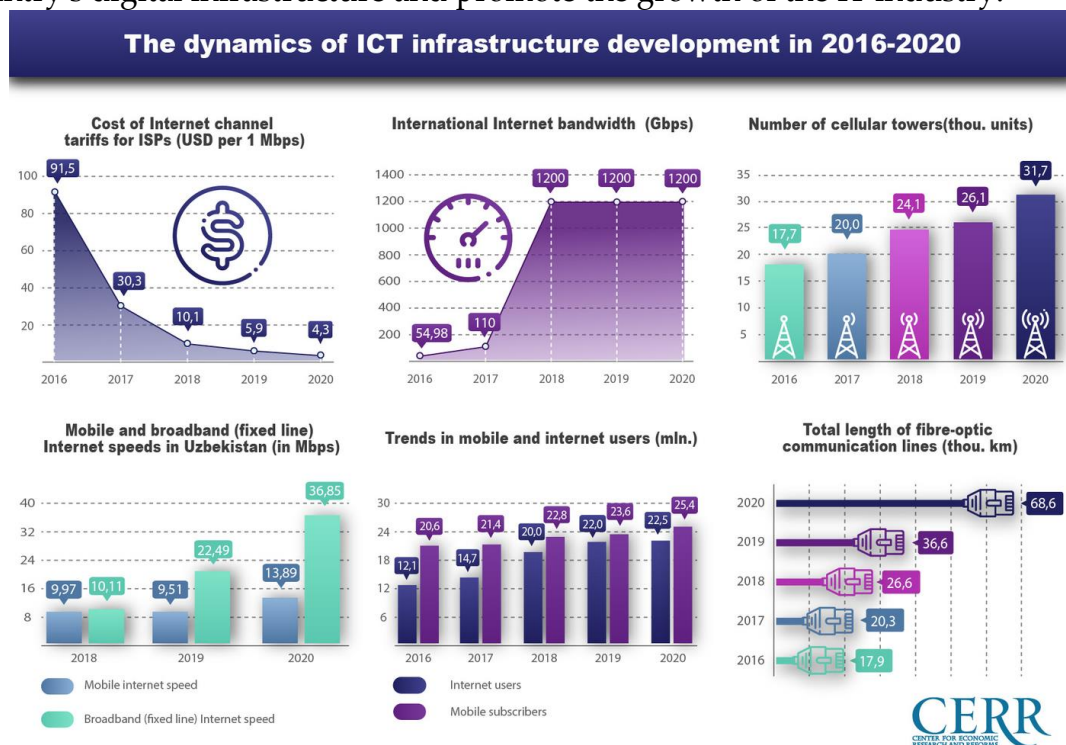


**The dynamics of ICT infrastructure development in 2016-2020**

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The program includes measures such as the development of high-speed internet networks, the establishment of technology parks, and the provision of tax incentives for IT companies. As a result of these initiatives, the IT industry in Uzbekistan has seen a significant increase in investment and job creation. The number of IT companies in the country has also increased, with many international companies setting up operations in Uzbekistan. However, there are still challenges that the industry faces, such as a shortage of skilled IT professionals and a lack of access to funding for startups. Nevertheless, the

| Strengths | Weaknesses |
|-----------|------------|
|           |            |

overall outlook for the IT industry in Uzbekistan is positive, and it is expected to continue to grow and contribute to the country's economic development.

One of the main spheres that nowadays is very important –ICT, Informaton Communication Technologies sector. We cannot imagine the modernizing society without IT industry. Because IT industry is one of the key drivers of economic growth. For 5 years, the field of information technology in Uzbekistan, like all other fields, has undergone great changes, which later affected not only the economy, but also the development of the country as a whole. In particular, the speed of the Internet has increased, the number of users of the World Wide Web, optical communication lines, mobile base stations, etc., and IT specialists have increased significantly.

**Internet access speed**

In 2015, the capacity of the international data transmission network was 16.07 Gbps, which is less than 9.63 Gbps in 2016. Since 2016, the indicators have improved their positions, and in 2017, the production capacity was 64.2 Gb/s, and in 2018, this figure increased several times and reached 1200 Gb/s. Today, the internet access speed is 1200 Gbit/s[3].

**The price of Internet service (external channel) tariffs for providers**

Since 2016, the price has started to decrease significantly. In particular, in 2016, the price of tariffs for Internet services (external channel) for providers was 157.6 US dollars, while last year this price was 101.69 dollars higher, i.e. 259.29 US dollars per 1 Mbit/s. From 2017 to 2020, there was a significant price drop, resulting in $3 per Mbps in 2021. The average price of Internet services around the world is 3-4 dollars for 1 Mbit/s.[4]

**Total length of optical fiber communication lines**

For 5 years, the total length of optical fiber communication lines has increased several times. In 2016, the length of optical fiber communication lines was 17.9 thousand kilometers. In 2021, the total length will be 81.7 thousand kilometers, but that's not all. By the end of 2021, it is planned to almost double their length and increase to 118,600 km.[5]

**IT Park: creation of the largest IT organization in the country**

From October 30 to October 2, 2018, the President of the Republic of Uzbekistan Shavkat Mirziyoyev paid his first visit to the Republic of India, where the Uzbek and Indian sides agreed to expand cooperation in the field of information technologies.

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[3] Speedtest Global Index, peedtest.net/global-index/Uzbekistan
[4] International cost of living index, https://www.expatistan.com/price/internet/tashkent
[5] Official website of Ministry of digital technologies of the Republic of Uzbekistan https://mitc.uz/en/stat/6

| | |
|---|---|
| 1. **Skilled workforce**: Uzbekistan has a large poo l of skilled IT professionals who are well-versed in various programming languages and technologies. <br> 2. **Government support**: The Uzbek government has been actively promoting the IT industry and has implemented various policies and initiatives to support its growth. <br> 3. **Cost-effective:** The cost of living in Uzbekistan is relatively low, which makes it an attractive destination for outsourcing IT services. <br> 4. **Strategic location:** Uzbekistan is strategically located at the crossroads of Asia, which makes it an ideal location for IT companies to serve clients in the region. <br> 5. **Growing market:** The demand for IT services in Uzbekistan is growing rapidly, driven by the increasing adoption of technology in various sectors. | 1. **Limited infrastructure:** The IT infrastructure i n Uzbekistan is still developing, and there are challenges in terms of connectivity and access to high-speed internet. <br> 2. **Limited market size:** The domestic market for IT services in Uzbekistan is relatively small, which limits the growth potential for local IT companies. <br> 3. **Limited access to funding:** Access to funding for IT startups and small businesses is limited in Uzbekistan, which can hinder their growth and development. <br> 4. **Limited international exposure:** The IT industry in Uzbekistan is relatively unknown on the international stage, which can make it difficult for local companies to compete with established players in the global market. <br> 5. **Limited diversity**: The IT industry in Uzbekistan is dominated by software development, with limited diversity in terms of other IT services. |
| **Opportunities** | **Threats** |

| | |
|---|---|
| 1. **Outsourcing:** Uzbekistan has the potential to become a major outsourcing destination for IT services, given its cost-effective workforce and strategic location.<br>2. **Digital transformation:** The increasing adoption of technology in various sectors presents opportunities for IT companies to provide digital transformation services.<br>3. **E-commerce:** The growth of e-commerce in Uzbekistan presents opportunities for IT companies to provide e-commerce solutions and services.<br>4.**Government initiatives:** The Uzbek government has implemented various initiatives to promote the IT industry, which presents opportunities for local IT companies to benefit from these policies.<br>5. **International partnerships:** Collaborating with international IT companies and establishing partnerships can help local IT companies gain exposure and access to new markets. | 1. **Competition:** The IT industry is highly competitive, and local IT companies in Uzbekistan face competition from established players in the global market.<br>2. **Cybersecurity threats:** The increasing reliance on technology also increases the risk of cybersecurity threats, which can impact the reputation and operations of IT companies.<br>3. **Economic instability**: Economic instability and political uncertainty in Uzbekistan can impact the growth and development of the IT industry.<br>4. **Talent retention:** The competition for skilled IT professionals can make it difficult for local IT companies to retain their workforce.<br>5.**Technological advancements:** Rapid technological advancements can make it difficult for local IT companies to keep up with the latest trends and technologies, which can impact their competitiveness. |

"The stability of our economy, quality and efficient work in all areas, and the comfort of the population depend on information technologies. That's why it is necessary to create wider opportunities for this industry, to create the necessary infrastructure, to encourage specialists, to educate talented young people," said Shavkat Mirziyoyev, the President of the Republic of Uzbekistan.

Reforms in recent years are accompanied by the active introduction of digital technologies into social life the population is setting priorities such as the use of electronic services, the gradual electronic transformation of public services and the improvement of the digital skills of the population.

In order to ensure the rapid digital development of the country in the Republic of Uzbekistan, eliminate the digital discrepancy in the territories, create the necessary environment for the development of innovative products, form a digital economy based on information, improve the efficiency of Public Administration, provide favorable public services to the population and entrepreneurial partners of the president of the Republic of Uzbekistan – 2030 decree"on measures to approve the strategy and its effective implementation " **(PF-No. 6079, 05.10.2020.)** were accepted. In this, as part of the digital transformation of the territory and networks in 2020-2022:

-the level of connection of settlements to the internet, including the increase of broadband connection ports to 2.5 million, the construction of 20 thousand kilometers of

fiber-optic communication lines and the development of mobile networks, from 78 to 95 percent;

-introduction of more than 400 information systems, electronic services and other software products in various areas of socio-economic development of Regions;

-introduction of more than 280 information systems and software products for automation of management, production and logistics processes in enterprises in the sectors of the real sector of the economy;

Implementation of the" Digital office " project on the basis of organizations and units under the Ministry of Information Technology and Communications Development and the Ministry of Justice; all ministries and departments, local executive authorities impose the powers of the deputy head for digitalization (Chief Digital Officer) on one of the current deputy heads;

Organization of training of 587 thousand people, including on the basis of computer programming, by covering 500 thousand young people under the project "one million programmers;

In the regions, relevant higher education institutions will be attached to improve the digital literacy and skills of employees of government bodies and organizations, to train them in Information Technology and information security, and a number of measures will be established, such as improving the qualifications of 12 thousand of their employees in the field of Information Technology

Also, the decree approved the strategy "digital Uzbekistan – 2030", which includes priorities for the development of the national market of digital infrastructure, e-government, digital economy, digital technologies and education and professional development in the field of Information Technology. At the same time, 3-year digital transformation programs developed by each region were developed in order to eliminate the digital disparity in all the gods of the Republic.

In 2020, 13 model districts (cities)to be digitally transformed were designated.

For reference:

Bozatov, Karakul, Zarbdor, Qarshi, Qiziltepa, Statabad, Nurabad, Shurchi, Boyovut, Piskent, Yozyovon, Khonka districts and the city of Khanabad.

The Ministry of information technology is entrusted with the tasks of fully digitizing the social facilities of 13 model districts (cities) to be digitally transformed in 2020 and bringing them into the form of a ready-made "model project" for the rest of the territories.

More than 460 projects will be implemented in the 3 – year digital transformation programs developed in the cross section of industries within the framework of the" digital Uzbekistan-2030 " strategy.

For the purpose of extensive use of advanced foreign experience

each network (74 offices) and territories (14) are attached to the leading foreign countries in the field of Information Technology (13) – "digital partners".

At the same time, it was established to direct not less than 5% of the funds of each investment project and international financial organizations involved to the "digital" component.

In each region, the tasks of opening technical schools for training personnel in Information Technology and opening a branch of the Tashkent University of Information Technology in the Tashkent region were established.

In the digital transformation programs developed by each network and territory, measures were established to train more than 500 thousand young people in digital technologies, to widely introduce the one million programmers project.

Digitization can reduce the cost of moving people and goods from one place to another. This reduces the importance of location for workers and businesses.

As a result, technological development in the regions can improve the quality and possibilities of using services, activate the participation of citizens in the processes of the life of the country, develop entrepreneurship and local labor markets.

ICT helps to improve information management within companies. They can reduce transaction costs and increase the speed and reliability of transactions for business-to-business (B2B) and business-to-consumer (B2C) transactions[6].

At the same time, it is also important to invest in teaching digital skills that integrate cognitive skills (literacy, numeracy and problem solving). The development of professional skills is of great importance to ensure communication between people who are still not related to each other[7].

**Conclusion and suggestions:** Uzbekistan faces several challenges in its IT sector, including inadequate infrastructure, a shortage of skilled professionals, and a lack of government support. To address these problems, the country needs to invest in its IT infrastructure, provide support for IT education and training programs, and offer incentives for IT businesses. By doing so, Uzbekistan can unleash the potential of its IT sector and promote innovation, economic growth, and social development.

The following can be suggested:

**1. Increase investment**: The government and private sector should invest more in the IT industry to help it grow and compete with other countries in the region.

**2. Develop a startup ecosystem**: Uzbekistan should develop a startup ecosystem that includes venture capital firms, angel investors, and incubators to support the growth of IT startups.

**3. Expand the market**: Uzbekistan should look to expand its market by targeting international customers and partnering with companies in other countries.

**4. Improve infrastructure**: The government should invest in improving the IT infrastructure in Uzbekistan to make it easier for companies to operate and compete in the global market.

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