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# Digital Transformation and ICT Development in Uzbekistan's Digital Economy

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## Abstract

This study examines the development trajectory of information and communication technologies (ICT) and their role in establishing the digital economy in the Republic of Uzbekistan during the transformative period of 2015-2024, a critical phase marked by systematic digital transformation initiatives under national strategic frameworks. The research aims to assess the effectiveness of ICT infrastructure development and digital service integration across economic sectors in Uzbekistan's transition toward a digitally-driven economy. Employing comparative economic analysis, systems approach, and observation methods, the study analyzes comprehensive statistical data from the International Telecommunication Union, Open Data Portal of Uzbekistan, and governmental reports, examining key indicators including internet penetration rates, broadband subscriptions, fiber-optic network expansion, mobile internet coverage, and e-government service adoption across banking, industry, agriculture, and education sectors. Empirical findings reveal substantial growth in internet users from 43.6% to 85%, broadband subscribers increasing from 5.2 million to 23 million, fiber-optic networks expanding from 16,000 km to 100,000 km, and electronic public services rising from limited availability to 595 services by 2024, with sector-specific ICT penetration reaching 85% in banking and finance. The novelty lies in providing systematic longitudinal evidence of digital transformation outcomes under the "Digital Uzbekistan-2030" strategy implementation, demonstrating accelerated digitalization post-2020. The findings offer significant implications for policymakers in developing economies pursuing digital transformation, confirming that coordinated state-level ICT infrastructure investments and e-government initiatives effectively establish foundational conditions for sustainable digital economic development and enhanced international competitiveness.

**Keywords** : Digital Economy, Information And Communication Technologies, ICT Infrastructure, E-Government Services, Digital Transformation, Broadband Penetration

**Highlight** :

- Internet users increased from 43.6% (2015) to 85% (2024) in Uzbekistan
- Electronic government services expanded from limited offerings to 595 services by 2024
- Banking sector digitalization reached 85%, leading all economic sectors by 2024.

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## Introduction

The acceleration of digital transformation processes in the global economy has established information and communication technologies (ICT) as a strategic factor of economic growth. In the context of the digital economy, ICT serves not only as a means of communication but also as a key instrument for data processing, decision-making, and the creation of economic value.

In this regard, the transition to a digital economy in the Republic of Uzbekistan during 2015–2024 has been implemented in a gradual and systematic manner, with ICT development identified as one of the priority directions of state economic policy. This process has led to significant changes in ICT infrastructure, the digital services market, and the institutional environment.

In particular, the "Digital Uzbekistan – 2030" strategy adopted in 2019 defined the country's pathway toward a digital economy [1]. The main objective of this strategy is to create a favorable ICT infrastructure, expand digital services, and establish a foundation for sustainable economic growth.

The adoption of the "Digital Uzbekistan – 2030" strategy represents one of the most important steps in Uzbekistan's integration into the digital economy. In accordance with this document, reforms and mechanisms aimed at effective ICT governance were identified as key priorities.

## Literature Review

The digital economy is an economic system based on information and communication technologies, where data and digital resources play a central role in economic organization and development.

Issues related to the development of the digital economy have been examined in numerous studies by foreign and domestic scholars. Pilipenko E.F. and Belalova G.A., in their article "Modern Trends in a Systematic Approach to Business Process Reengineering," focus on the application of system analysis and systems thinking in the design of information systems and business process reengineering [2]. The authors also discuss key principles to be observed in reengineering processes and present alternative models of operations, procedures, and interactions.

Balatsky E.V. and Ekimov N.A., in their work "Innovation-Technological Matrices and National Strategies of Economic Development," propose a research methodology based on relative labor productivity indices and relative unit costs of research and development. This approach enables the identification of countries pursuing non-traditional innovation strategies characterized by advanced R&D development relative to the manufacturing sector.

Hashimkhojaev S.I., in his article "The Impact of Digital Transformation on Economic Processes in the Republic of Uzbekistan," examines issues related to the transformation of the educational process in higher education institutions under conditions of digital economy formation.

Studies on the characteristics of digital economy development in Uzbekistan emphasize that ICT currently acts as a key driver of economic growth, a tool for developing strategically important sectors, a means of improving governance efficiency, and a critical factor in enhancing national economic competitiveness [3].

## Research Methodology

The study analyzes economic and statistical indicators of digital economy development both globally and within Uzbekistan. Trends in ICT development under digital economy conditions were examined, and a comprehensive database was compiled. Based on the collected data, research methods such as observation, comparative economic analysis, systems approach, and logical analysis were effectively applied.

## Analysis and Results

ICT infrastructure constitutes the foundational element of the digital economy. Over the past decade, Uzbekistan has experienced significant improvements in internet coverage, data transmission speed, and the quality of telecommunication services.

Table 1 presents key indicators of ICT infrastructure development in Uzbekistan for the period 2015–2024, including internet user penetration, broadband subscribers, fiber-optic network length, and mobile internet coverage, based on verified sources.

**Table 1.** Key Indicators of Internet and ICT Infrastructure Development in Uzbekistan (2015–2024)

| Year | Internet users (%) | Broadband internet subscribers (million) | Length of fiber-optic lines (thousand km) | Mobile internet coverage (%) |
|---|---|---|---|---|
| 2015 | 43,6 | 5,2 | 16 | 62 |
| 2016 | 46,9 | 6,1 | 20 | 67 |
| 2017 | 50,7 | 7,2 | 24 | 71 |
| 2018 | 55,2 | 8,4 | 28 | 75 |
| 2019 | 59,8 | 9,9 | 34 | 80 |
| 2020 | 65,3 | 12,1 | 45 | 85 |
| 2021 | 70,2 | 14,5 | 54 | 88 |
| 2022 | 78,1 | 18,5 | 68 | 92 |

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| | | | | |
|---|---|---|---|---|
| 2023 | 81,5 | 21,0 | 85 | 95 |
| 2024 | 85,0 | 23,0 | 100 | 97 |

*Compiled by the author based on data from the International Telecommunication Union (ITU), the Open Data Portal of Uzbekistan (data.gov.uz), and reports of the Ministry for the Development of Information Technologies and Communications of the Republic of Uzbekistan. Annual indicators for the years between 2015, 2018, 2020, 2022, and 2024 were interpolated based on the average growth trend.

A comparative analysis of the data presented in Table 1 shows that the share of internet users among the population increased significantly from 43.6% in 2015 to 85% in 2024. This growth is associated with the expansion of internet coverage, as well as the increased use of smartphones and mobile devices. After 2022, the growth rate accelerated considerably, indicating the mass adoption of the digital economy.

The second column of the table demonstrates that the number of broadband internet subscribers increased from 5.2 million in 2015 to 23 million in 2024. This indicator is crucial for ensuring high-quality and high-speed internet access for both households and businesses in line with international standards. The steady year-on-year growth in the number of subscribers reflects the effectiveness of government programs aimed at developing digital infrastructure.

The third column shows that the length of fiber-optic lines expanded from 16 thousand km to more than 100 thousand km. This growth indicates the establishment of high-speed internet networks and an increase in data transmission capacity through fiber-optic infrastructure. The rapid expansion observed after 2020 demonstrates the effectiveness of state investments and large-scale infrastructure projects.

According to the fourth column, mobile internet coverage increased from 62% in 2015 to 97% in 2024. This indicates a significant expansion of opportunities for households and businesses to access mobile internet services. During the period 2020–2024, the deployment of LTE and 5G networks contributed to improvements not only in coverage but also in connection speed and service quality.

Overall, these growth indicators confirm that Uzbekistan's internet and ICT infrastructure experienced stable and sustained development during 2015–2024. The increasing share of internet users and the expansion of mobile internet coverage became key drivers of digital economy growth and the wider adoption of electronic services [4]. Furthermore, the expansion of broadband access and fiber-optic networks represents one of the fundamental pillars ensuring the efficiency of digital infrastructure and the successful implementation of digital transformation.

In the Republic of Uzbekistan, the development of the ICT sector has been supported at the state level, and comprehensive reforms have been implemented within the framework of the "Digital Uzbekistan – 2030" strategy. The main directions of state policy have focused on the development of e-government, open data, and digital public services.

Figure 1 below illustrates the dynamics of the development of electronic public services (Unified Interactive Public Services Portal – my.gov.uz) over the period 2015–2024. The figure demonstrates the systematic growth in the number of electronic services: while only a limited number of services were available on the portal in 2013, by 2024 the number of services had increased more than fivefold. This trend indicates that the automation of public services and the provision of services to citizens via the internet are approaching international standards. As a result, the range of public services available to citizens and entrepreneurs has expanded significantly.

According to data for 2023, a total of 472 services were available on the portal, the majority of which were designed for use by citizens and business entities [5]. This expansion serves one of the key objectives of the digital economy—simplifying the business environment and reducing administrative barriers.

The year 2024 marked a major strategic milestone in the implementation of public services. In particular, as a result of the integration of technologies, information systems, and data platforms, the number of electronic public services exceeded 595 in 2024, reflecting a high level of digitalization of public services. In the coming years, the total number of electronic services is expected to exceed 700.

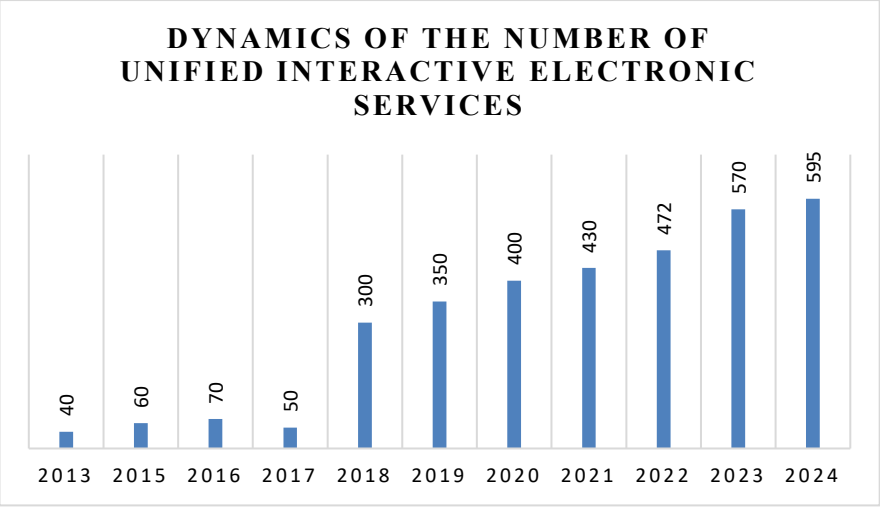


**Figure 1.** Dynamics of the Development of Electronic Government

**Services (2015–2024)[6]**

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It is worth noting that the share of electronic government service requests in Uzbekistan significantly increased during the period from 2019 to 2024. The main reasons for this growth are as follows:

Increase in the number and quality of electronic services: After 2020, the number of services provided through the electronic services portal sharply increased, resulting in greater convenience for users.

Integration of the services portal and citizen activity: The Unified Interactive State Services Portal (my.gov.uz) transformed the citizens' application process into an electronic format, which led to the growth in the share of requests.

Rapid growth during 2021–2022: The share of electronic requests rose from 54% to 66%, reflecting the popularization of electronic government services, the online submission of orders, and the expansion of opportunities to obtain information electronically.

Share of electronic requests reached 70–75% in 2023–2024: This was the result of digitalization of government services and expansion of mobile platform access to applications. At the same time, high levels of digital literacy and internet coverage supported this trend [7].

The above indicators demonstrate the share of usage of electronic government services in Uzbekistan — reflecting the public's trust and level of usage of online government services. While electronic request activity was relatively low in 2019, by 2024 this indicator had reached around 75%. This trend indicates the popularization of digital services, the increasing experience of citizens in working with the government via electronic requests, and the improved effectiveness of digital economy and electronic government service implementation.

Furthermore, when discussing the trends of ICT integration into economic sectors, the impact of ICT in the digital economy is clearly seen in banking and finance, industry, agriculture, and social sectors. Figure 2 shows the degree of ICT penetration into the economic sectors of Uzbekistan in percentage terms [8].

From the diagram below, it can be seen that in 2015 the penetration rate of ICT in the banking and financial sector was approximately 35%. At that time, the rapid expansion of online payments and internet banking services began, and some banks started introducing digital services.

According to research on digital services in the banking sector in 2020, digital payments and online banking activity increased to 65%. This growth was driven by the expansion of mobile banking users and electronic payment systems. By 2024, as the population actively used mobile and internet services, the level of digitalization in the banking sector reached 85%. This development is associated with the widespread use of bank cards, online payments, mobile applications, and electronic money systems. It should be noted that, although these figures are not yet provided in official statistics in detail, international studies and national statistics indicate the growth of digital financial services. The penetration of ICT in the banking and finance sector demonstrates one of the highest stages of digital transformation in the country's economy.

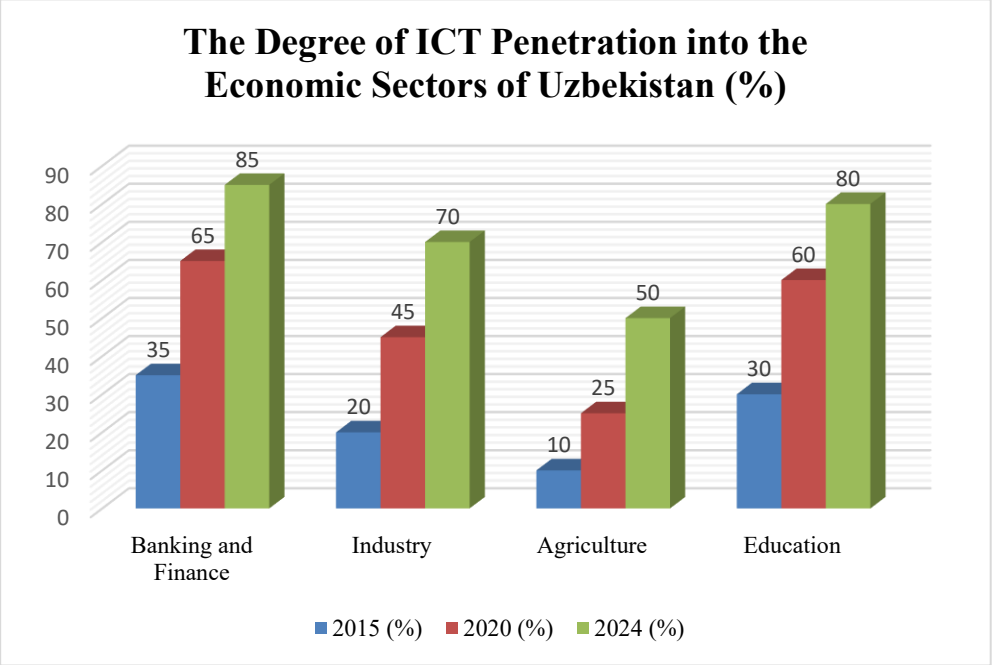


**Figure 2.** The Level of ICT Penetration in the Sectors of Uzbekistan's Economy
Developed by the author based on scientific sources [9][10][11].

In the industrial sector, digitalization in 2015 was relatively low, around 20%, representing the early stages of mechanization and automation. By 2020, the adoption of ICT accelerated in industry, with the introduction of digital management, ERP systems, and automated data analysis, increasing the digitalization level to approximately 45%. By 2024, digital technologies became widely applied across industrial enterprises, with IoT, intelligent management systems, and automation increasing the digitalization level to 70%. This trend reflects industrial digital integration in line with global standards. The industrial sector is one of the leading sectors in adopting digital technologies, achieving a high level of technological integration by 2024 [12].

In agriculture, digitalization in 2015 was relatively low, approximately 10%, relying primarily on traditional methods. At that time, statistical platforms and data systems were in the initial stages. By 2020, some agricultural platforms automated data collection and introduced integration technologies with tractors and sensors, raising digitalization to around 25%. By 2024, the use of IoT and Big Data in agriculture increased the digitalization level to 50%. This growth is associated with improving efficiency, monitoring, and streamlining agrarian production processes [13].

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While agricultural digitalization is progressing rapidly, it remains less developed compared to other sectors.

In education, the adoption of digital technologies in 2015 was around 30%, primarily in the early stages of e-learning systems, online information platforms, and distance learning tools. By 2020, the rapid spread of online learning and interactive platforms during the pandemic increased the digitalization level to approximately 60%. By 2024, the expansion of electronic education systems, LMS platforms, e-books, and circulation platforms raised digitalization to 80% [14][15]. The education sector is among the sectors with the highest growth in ICT adoption, in line with global trends.

## Conclusion

The level of ICT penetration across economic sectors in Uzbekistan demonstrated steady and significant growth during 2015–2024. This trend reflects the development of the digital economy, the expansion of electronic services, the implementation of national and strategic programs, and the integration of technologies across all sectors.

Between 2015 and 2024, the development of ICT in Uzbekistan laid the institutional and infrastructural foundation for the formation of a digital economy. This process accelerated digital transformation across economic sectors and contributed to enhancing the national economy's competitiveness.

Moreover, the degree of ICT adoption in banking and finance, industry, agriculture, and education increased year by year. In particular, the high level of digitalization in the banking and education sectors indicates a deepening of digital transformation processes within key economic sectors.

Overall, the research results demonstrate that reforms implemented under the "Digital Uzbekistan – 2030" strategy have established an important institutional and technological foundation for the development of the country's digital economy.

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