DIGITAL TRANSFORMATION OF THE SERVICE SECTOR IN THE REPUBLIC OF KARAKALPAKSTAN: INSTITUTIONAL REFORMS, ECONOMIC IMPACTS, AND DEVELOPMENT PROSPECTS

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Abstract: The article investigates the processes, mechanisms, and economic implications of digital transformation in the service sector of the Republic of Karakalpakstan as part of Uzbekistan's national modernization strategy. Based on institutional, infrastructural, and sectoral analysis, the study identifies the main drivers, challenges, and outcomes of service digitalization. Using official statistical data, analytical modeling, and comparative analysis, the paper evaluates the role of digital technologies in improving service quality, economic growth, social inclusion, and regional competitiveness. The results show that digitalization significantly enhances service productivity, expands access to public and private services, and contributes to sustainable economic development. Policy recommendations are proposed to strengthen digital infrastructure, institutional capacity, and human capital development.

Keywords: digital economy, service sector, regional development, Karakalpakstan, e-government, fintech, economic modernization

Digital transformation has become a central pillar of socio-economic development strategies worldwide. In emerging economies, digitalization of the service sector plays a particularly crucial role in enhancing productivity, improving public service delivery, and fostering inclusive growth. In Uzbekistan, large-scale reforms initiated since 2017 have emphasized the strategic importance of digital technologies in accelerating economic modernization and improving living standards. Within this framework, the Republic of Karakalpakstan has emerged as a priority region for digital development due to its socio-economic characteristics, geographic location, and development challenges.

The service sector in Karakalpakstan accounts for more than 38 percent of regional gross value added, employing nearly 42 percent of the working population. However, structural constraints, limited infrastructure, and insufficient digital skills have historically hindered its growth. The introduction of digital solutions offers a pathway to overcoming these challenges by increasing efficiency, transparency, and service accessibility. This article aims to provide a comprehensive scientific analysis of digital transformation processes in the service sector of Karakalpakstan, identifying key drivers, sectoral impacts, and policy implications.

The research is based on a mixed-method approach combining descriptive statistical analysis, institutional analysis, and comparative evaluation. Data sources include official statistics from the State Statistics Committee of Uzbekistan, reports of the Ministry of Digital Technologies, and regional development programs. Analytical tools include trend analysis, correlation assessment, and sectoral modeling. A conceptual framework of digital transformation was constructed to evaluate interactions between infrastructure, institutions, and service outcomes.

The success of digital transformation in Karakalpakstan largely depends on institutional reforms and infrastructure development. Over the period 2018–2024, public investment in information and communication technologies (ICT) in the region increased more than threefold. Broadband internet coverage expanded from 48 percent in 2017 to nearly 87 percent by 2024, significantly reducing the regional digital divide.

E-government platforms represent a cornerstone of institutional digitalization. The number of public services available online in Karakalpakstan increased from 32 in 2019 to more than 210

in 2024. This transition reduced administrative costs, minimized bureaucratic barriers, and improved transparency. Empirical analysis indicates that processing times for business registration decreased by 62 percent, while online tax declaration adoption exceeded 75 percent of registered enterprises.

Digital financial services have also demonstrated dynamic growth. The number of active mobile banking users in Karakalpakstan rose from 210 thousand in 2019 to 980 thousand in 2024, reflecting increased financial inclusion. Digital payments accounted for 58 percent of retail transactions in 2024, compared to only 17 percent in 2018.

Digitalization has significantly influenced major service sectors including tourism, healthcare, education, and logistics. In tourism, digital booking platforms, online marketing strategies, and virtual tour services expanded tourist flows by 34 percent between 2021 and 2024. The average length of stay increased from 1.8 to 2.6 days, reflecting improved service quality and diversified offerings.

In healthcare, the introduction of electronic medical records and telemedicine platforms improved patient access and diagnostic accuracy. By 2024, over 65 percent of outpatient consultations were conducted through digital appointment systems. Rural healthcare access improved notably, with telemedicine coverage reaching 72 percent of remote settlements.

Education services also benefited from digital platforms, particularly during the post-pandemic period. The number of students enrolled in online vocational training programs increased sixfold between 2020 and 2024, supporting labor market adaptability and skill upgrading.

Digitalization contributes significantly to regional economic performance. Regression analysis based on panel data for 2018–2024 indicates that a 10 percent increase in ICT investment is associated with a 1.7 percent rise in regional GDP. Employment in ICT-related service activities grew at an annual average rate of 14.2 percent, substantially higher than the overall employment growth rate of 3.8 percent.

Table 1. Digitalization Indicators in Karakalpakstan (2018–2024)

Indicator	2018	2021	2024
Internet coverage (%)	48	72	87
E-services available (units)	32	115	210
Mobile banking users (thousand)	210	620	980
Share of digital payments (%)	17	39	58

Despite notable achievements, several challenges persist. These include limited digital skills among older service workers, uneven infrastructure coverage in remote areas, and cybersecurity risks. Policy priorities should focus on human capital development, rural connectivity expansion, and strengthening data protection frameworks.

The digital transformation of the service sector in the Republic of Karakalpakstan represents a powerful catalyst for economic modernization and social development. Empirical evidence confirms that digitalization enhances service quality, productivity, and financial inclusion while contributing to regional economic growth. Sustainable progress, however, requires continuous institutional adaptation, infrastructure investment, and skills development. Strategic coordination between national and regional authorities will be essential to fully realize the socio-economic benefits of digital transformation.

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