Digital Transformation and Regional Development: Regional Features in the Innovative Development of the Service Sector (On the Example of the Regions of Uzbekistan)

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Abstract: In the context of accelerating digital transformation, the analysis of regional features in the innovative development of the service sector is becoming increasingly relevant. The article examines the relationship between digitalization, regional development, and service quality in the regions of Uzbekistan. Based on the experience of European countries (Estonia, Germany, Finland), the main factors contributing to the successful implementation of digital transformation at the local level have been identified. Cluster analysis, SWOT-assessment, and index modeling methods were used to assess the level of digital maturity in 12 regions of Uzbekistan (Tashkent, Samarkand, Fergana, Surkhandarya, and others). The results show that the introduction of digital platforms in the service sector increases the availability and quality of public services by 30-45%, especially in regions with developed information and communication technology infrastructure. At the same time, significant differences were found between central and peripheral regions. Recommendations have been developed for the harmonization of digital policy, strengthening interregional cooperation, and increasing the digital competence of the population.

Keywords: digital transformation, regional development, service sector, regional characteristics, innovative development, digital maturity, cluster analysis, SWOT assessment, Uzbekistan.

Introduction

In the modern economy, digital transformation is not only a technological renewal, but also a process that fundamentally changes economic, social, and management systems. In particular, the service sector - that is, public services, healthcare, education, finance, transport, and utilities - is one of the sectors that makes the most use of digital technologies. However, the effectiveness of digital solutions depends on regional conditions, the level of infrastructure, the digital literacy of the population, and the compatibility of local governance systems.

Digitalization of the service sector is being widely implemented in the Republic of Uzbekistan within the framework of the "Digital Uzbekistan 2030" strategy. However, in practice, regions such as Tashkent, Jizzakh, or Namangan are far ahead in digital development, while regions such as Surkhandarya, Kashkadarya, or the Republic of Karakalpakstan still lack digital infrastructure, personnel, and financial resources[1, 2].

Therefore, the relevance of this research lies in the scientific analysis of trends in the innovative development of the regions of Uzbekistan in the service sector, regional differences, and integration opportunities in the process of digital transformation. The purpose of the study is to develop practical recommendations for the effective implementation of digital transformation, taking into account regional characteristics[3, 4].

Scientific work analysis: European countries have created best practices for integrating digital transformation and regional development:

Estonia is one of the most digital countries in the world, and within the framework of the "e-Estonia" project, all government services (tax, healthcare, education, passport services) are provided to the population online. 99% of the population uses digital ID services. This system de facto abolished regional boundaries[5, 6].

Germany - Achieves regional equalization of education quality by providing schools with digital infrastructure through the DigitalPakt Schule program. Also, within the framework of the "Smart Cities" program, more than 500 cities have implemented a network of digital services (smart transport, energy, healthcare).

Finland - Focused on improving the digital literacy of the population through the Digital Finland Framework policy. Free digital competency courses are offered to every citizen. As a result, 92% of the population under the age of 65 independently use digital services.

A common feature of these countries is the acceptance of digital transformation not only as a technology, but also as a means of socio-political and territorial development.

The following scientific methods were used in the research:

Cluster analysis is the grouping of regions by digital infrastructure, service quality, population size, and the level of digital literacy[7].

SWOT-assessment - identifying the strengths/weaknesses, opportunities, and threats of each region in terms of digital transformation.

Index modeling - the "Digital Services Index" (DSI) has been developed, which consists of 5 components: access, usability, quality, security, return.

Procedure:

✓ Stage 1: Statistical data for 2021-2024 were collected for 12 regions of the Republic of Uzbekistan (State Statistics Committee, "AIS Public Services," UzDigital Agency).

✓ Stage 2: Public Service Centers for each region were calculated.

✓ Stage 3: regions were divided into 3 clusters using the K-means algorithm[8].

✓ Stage 4: A SWOT analysis was conducted for each cluster.

✓ Stage 5: Recommendations were developed based on the experience of European countries.

The research methodology was implemented based on practical examples:

Example of calculating the PIU index:

Tashkent region: entry - 0.92, use - 0.88, quality - 0.85, safety - 0.90, return - 0.80 → DPI = 0.87 (high level).

Surkhandarya region: entry - 0.45, use - 0.38, quality - 0.40, safety - 0.50, return - 0.35 → DXI = 0.42 (low level) [9].

Cluster analysis example:

➢ Cluster 1 (Top): Tashkent, Jizzakh, Namangan

➢ Cluster 2 (Mid): Samarkand, Fergana, Andijan

➢ Cluster 3 (Low): Surkhandarya, Kashkadarya, Karakalpakstan

➢ Example of SWOT analysis (Surkhandarya):

Strengths: rural population density, agricultural potential.

Weaknesses: low internet speed (average 8 Mbps), limited number of digital services.

Opportunities: Implementation of the "Smart Village" project.

Threats: migration of young people to cities.

Pilot project: The "Electronic Polyclinic" system has been implemented in the Fergana region. As a result, 68% of patients noted a 70% reduction in waiting time.

As a result of the research, the following achievements were identified:

With the introduction of digital services, access to services has increased by 30-45%.

In the Tashkent region, the level of use of electronic services has reached 89%.

Population participation increased by 25% due to the introduction of digital services in less developed regions.

The disparity between regions according to the PIU index decreased from 0.52 in 2021 to 0.41 in 2024 (i.e., the inequality decreased by 21%).

Thanks to digital literacy programs, 62% of the population under the age of 45 learned to use services independently[10].

Results and discussion: The results obtained show that digital transformation is an effective tool for developing the service sector, but its impact is directly related to regional conditions. Digital solutions will be implemented faster due to the availability of digital infrastructure, personnel, and financial resources in the central regions. In remote regions, however, this process is proceeding more slowly.

At the same time, the experience of European countries shows that for the successful implementation of digital transformation, it is necessary not only technology, but also the involvement of the population, increasing digital literacy, and strengthening local authorities. In Uzbekistan, targeted programs (for example, "Digital Village" or "Regional Digital Centers") should also be developed for regions in the "low" cluster.

Conclusion: Digital transformation is the main tool for ensuring regional development and allows achieving especially high efficiency in the service sector. The study of the regions of Uzbekistan made it possible to identify regional differences and improve digital policy based on a differentiated approach. The experience of European countries has shown the importance of an integrated approach, public participation, and institutional support.

In the future, it is recommended to work in the following areas:

➢ Development of digital infrastructure in regions of the "low" cluster;

➢ Wide implementation of free digital competency programs for the population;

➢ Creation of mechanisms for the exchange of interregional digital resources;

➢ Expansion of the right of local authorities to manage digital projects.

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