



STRATEGIC APPROACHES FOR UZBEKISTAN IN THE CONTEXT OF DIGITAL TRANSFORMATION

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Abstract

The study analyzes the current state, challenges, and prospects of digital transformation in Uzbekistan using the DELPHI method, involving 20 experts from IT, economics, entrepreneurship, and government administration. Based on the works of Schallmo & Williams (2018), Dörner & Edelman (2015), Brennan & Kreiss (2014), TransformWork (2023), and the Decree of the President of the Republic of Uzbekistan (PF-6079), the findings indicate that digital infrastructure, e-commerce, and fintech services are key factors in the transition to a digital economy. The expert consensus level increased from 60% to 95%, confirming the effectiveness of the DELPHI method. The study proposes strategic recommendations for expanding IT infrastructure, developing e-commerce and fintech, accelerating government digitalization, and improving IT workforce training. These findings contribute to shaping a scientifically grounded digital transformation strategy for Uzbekistan.

Keywords: Digital transformation, DELPHI method, Uzbekistan economy, IT infrastructure, e-commerce, fintech, government digitalization, IT workforce development, innovative technologies, strategic development.

INTRODUCTION

Nowadays, digital transformation (DT) is becoming an integral part of economic, social, and cultural processes worldwide. The implementation of digital technologies into business processes serves to increase efficiency, create new opportunities, and ensure competitiveness (Schallmo & Williams, 2018).



This article analyzes the scientific significance of DT, global trends, and its relevance in the context of the Republic of Uzbekistan. From a scientific perspective, DT research plays a crucial role in the fields of business model innovation, information technology management, and strategic management. According to studies by Porter and Heppelmann (2014), digital technologies enable the integration of products and services into intelligent networks, thereby creating new value. At the same time, DT requires not only technological modernization but also organizational change (Westerman et al., 2011). It is important to distinguish between the concepts of digitization, digitalization, and digital transformation (Brennan & Kreiss, 2014).

Digital transformation is one of the key factors driving macroeconomic changes on a global scale. According to research by the International Data Corporation (IDC), it is believed that by 2025, over 60% of global companies will have fully implemented DT strategies (Gens, 2016). Internationally, digital giants such as Google, Amazon, Apple, Facebook, Alibaba, and Tencent have transformed their business models, thereby reshaping entire ecosystems (Forni, 2016). Strategic programs for developing DT have been developed in the European Union and OECD countries, significantly impacting all sectors of the economy (TransformWork, 2023).

In Uzbekistan, digital transformation has been designated as one of the priority areas of state policy. According to the “Digital Uzbekistan – 2030” strategy adopted in 2019, digital technologies are being introduced across various sectors of the economy. The electronic government system is being developed, and digital services are being expanded to simplify business processes (Presidential Decree of the Republic of Uzbekistan, 2019). Additionally, fintech, e-commerce, and smart city projects are progressing. However, in order to fully implement the DT process, there is a need to train personnel, modernize infrastructure, and cultivate a digital culture.

LITERATURE REVIEW

Digital transformation is an integral part of modern business and the economy, serving to enhance efficiency and ensure competitiveness through the implementation of new technologies. In this field, the study *"Digital



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Transformation Now!"* by D. R. A. Schallmo and C. A. Williams (2018) explores the concept of digital transformation, its impact on business models, and its practical applications. The study introduces a five-phase roadmap of digital transformation—**Digital Reality, Digital Ambition, Digital Potential, Digital Fit, and Digital Implementation**—which helps outline clear strategies for successfully digitizing business processes (Schallmo & Williams, 2018).

K. Dörner and D. Edelman (2015), in their research titled *"What 'digital' really means,"* emphasize that digital transformation is not merely a technological process but also a profound change in business processes and corporate culture. Based on definitions and methodologies developed by McKinsey & Company, the authors explain how organizations should adapt to digital transformation. Their study identifies three core directions of digital transformation: creating new business opportunities, optimizing customer experience, and developing core organizational capabilities (Dörner & Edelman, 2015).

Terminological clarity is essential in the process of digital transformation. S. Brennan and D. Kreiss (2014), in their work *"Digitalization and Digitization,"* distinguish between digitization (converting analog data into digital form), digitalization (enhancing business processes using digital technologies), and digital transformation (strategic and operational changes within an organization). Clarifying these terms allows business entities to choose the right direction when formulating and implementing digital strategies (Brennan & Kreiss, 2014).

On a global scale, the significance of digital transformation is emphasized in F. Gens' (2016) study *"IDC FutureScape: Worldwide IT Industry 2017 Predictions,"* which notes that by 2025, over 60% of large companies are expected to have fully implemented digital transformation strategies. According to IDC research, technologies such as artificial intelligence, big data, and automation systems are fundamentally reshaping business processes. This underscores the need for companies to invest in and adopt new technologies (Gens, 2016).

Within the European Union and OECD countries, digital transformation policy is widely addressed in the document *"Digital Transformation Concept Note"* by TransformWork (2023). This document outlines the impact of digital



technologies on business models, economic systems, and labor markets. It also presents strategic approaches focused on expanding public-private partnerships, increasing digital literacy, and promoting inclusive development of information technologies (TransformWork, 2023).

In Uzbekistan, the significance of digital transformation at the state policy level is outlined in the Presidential Decree (2019) **“Digital Uzbekistan – 2030.”** This strategy includes the implementation of electronic services across various sectors of the economy, the digitalization of public administration, and the development of information technologies. It also calls for the advancement of fintech, e-commerce, and smart city projects, all aimed at enhancing the positive impact of digital transformation on the national economy (Presidential Decree of the Republic of Uzbekistan, 2019).

The above studies and documents confirm the scientific, global, and national relevance of digital transformation. They provide guidance for organizations and government bodies in shaping digital strategies, adopting innovative technologies, and defining key directions for successful operations in a digital economy.

METHODOLOGY

The DELPHI method is an expert evaluation technique used to scientifically analyze and forecast complex and uncertain issues. This method synthesizes expert opinions through a multi-stage approach, helping to provide a scientific basis for strategic decision-making processes. When analyzing global processes such as digital transformation, the DELPHI method offers high accuracy and reliability by enabling structured discussions among experts from various fields. In this study, the DELPHI method was applied as a multi-stage expert evaluation tool to analyze opinions of specialists from different sectors and reach a consensus on key issues.



Stage	Implemented Processes	Outcome
1. Selection of Experts	Economists, IT specialists, government representatives, and business leaders are involved.	Participation of experts from various fields in the evaluation process is ensured.
2. Initial Survey	Specific questions regarding the economic impact of digital transformation are presented.	Initial opinions are gathered and key issues are identified.
3. Analysis of Results	Expert evaluations are statistically processed and summarized.	The presence or absence of overall consensus is determined.
4. Repeated Survey	Experts are given the opportunity to revise their opinions based on previous results.	Expert views are aligned and discrepancies are reduced.
5. Formulation of Final Results	Scientific recommendations are developed based on the collected data.	Clear directions for advancing digital transformation are identified.

The DELPHI Method consists of five main stages, each aimed at ensuring the scientific validity of the research process:

Selection and Formation of Experts. To ensure the scientific reliability of the study, experienced professionals are involved. Experts such as economists, IT specialists, government administration representatives, and leading entrepreneurs from the business sector are selected to analyze various aspects of the digital transformation process. During the expert selection process, the following criteria are considered: years of experience, number of academic publications in the field, practical expertise, and participation in international projects.

Initial Survey and Data Collection. To examine the economic, technological, social, and legal aspects of digital transformation, tailored questionnaires are distributed to the experts. These questionnaires include both open-ended and closed questions, addressing the following topics:



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- The economic efficiency of digital transformation
 - Development trends in e-commerce and fintech services
 - Challenges related to IT professionals and cybersecurity
 - Digitalization of public administration systems
 - The impact of artificial intelligence and automation on the economy

Expert responses in the initial phase are analyzed through mathematical and statistical methods. The average expert rating (S) and the variance of opinions (σ^2) are also calculated.

Scientific Data Analysis and Re-Evaluation. Data collected during the initial phase is statistically analyzed to identify similarities and differences in expert opinions. If the variance level is high, a new round of surveys is conducted, and experts are requested to reassess their views. This process helps to refine expert positions and achieve unified, scientifically grounded results.

The overall expert rating is calculated using the following formula:

$$S = \frac{\sum_{i=1}^n X_i}{n}$$

Where:

S - Average score given by the experts

X_i - Score provided by each expert

n - Number of experts

To determine the variance (σ), which reflects the level of disagreement among expert opinions:

$$\sigma^2 = \frac{\sum_{i=1}^n (X_i - S)^2}{n}$$

If the variance is high, it indicates significant differences in expert opinions, and an additional round of the survey is required.



The reliability (weight) of each expert (w) is calculated as follows:

$$W_i = \frac{E_i}{\sum_{j=1}^n E_j}$$

Where:

E_i - The qualification and experience of the i-th expert

n - Total number of experts

This coefficient helps determine the reliability of each expert and assign a weight to their opinion accordingly.

Reaching consensus among experts:

Based on the results of repeated surveys, expert opinions are analyzed, and final adjustments are made to achieve consensus. At this stage, clear scientific recommendations are formulated, ensuring they are evidence-based. If there is still a significant discrepancy in expert opinions, the study proceeds to an additional round.

DISCUSSION AND RESULTS

The DELPHI method serves as an important scientific tool for developing future forecasts regarding the economic efficiency, social impact, and technological development of digital transformation in Uzbekistan. To analyze the economic efficiency of digital transformation in the Republic of Uzbekistan, the following expert groups were selected:

Table 1. Digital Transformation Data

Category of Experts	Total Number of Participants
Economists	10
IT Specialists	12
Government Representatives	8
Business Sector Experts	15
Academic Researchers	10
Total:	55



Year	GDP Growth (%)	IT Investments (billion UZS)	Internet Users (%)	Digital Payment Systems (billion UZS)	E-Commerce Share (%)
2015	5.8	450	42	120	1.5
2016	6.2	600	48	180	2.1
2017	5.3	750	55	250	3.4
2018	5.4	980	60	400	4.8
2019	5.6	1300	65	620	6.2
2020	1.6	1600	70	900	7.9
2021	7.4	2000	75	1350	9.5
2022	5.7	2500	80	1850	11.4
2023	5.5	3100	85	2400	14.2

Stage	Process
Selection of Experts	20 experts from the fields of IT, economics, entrepreneurship, and public administration were engaged.
Initial Survey	Questionnaires were conducted to identify key problems and opportunities in digital transformation.
Analysis of Results	Similarities and differences in expert opinions were identified and statistically analyzed.
Repeated Survey	Based on second-phase results, additional evaluations were conducted to clarify expert views and develop strategic recommendations.
Final Results	The results were summarized and strategic directions for digital transformation in Uzbekistan were defined.

Table 1. Expert Evaluation Results in the Context of Uzbekistan

A study was conducted using the DELPHI method in the context of Uzbekistan to identify the impact of digital transformation on the economy and to determine strategies for its development. The following stages were carried out during this process:

Expert Selection: 20 experienced professionals from the fields of digital economy, IT, entrepreneurship, and public administration were involved. The experts were evaluated based on their age, experience, and scientifically grounded viewpoints.



Initial Survey: Experts were provided with questionnaires focusing on the key challenges and opportunities of digital transformation. The following issues were examined:

- Adequacy of IT infrastructure
- Development of e-commerce and the fintech sector
- Digitalization of public services
- Impact of artificial intelligence and IoT technologies on business

Statistical Analysis of Results: Expert opinions were statistically analyzed to identify similarities and differences. In the initial phase, the consensus level was 60%. Variance analysis was used to measure the degree of divergence among experts, revealing the need for an additional round to achieve consensus.

Repeated Survey: Based on the opinions put forward by experts, the main strategic directions for digital transformation were defined. As a result of the survey, the most prioritized areas were identified as:

- Development of digital education
- Training of IT specialists
- Improvement of the legal framework
- In the second round, the level of agreement among experts increased to 85%.

Final Results: Strategic directions for digital transformation in Uzbekistan were developed. The final expert consensus reached 95%, and the following key recommendations were formulated:

- Promote public-private partnerships to expand digital infrastructure
- Develop IT education and implement an international certification system
- Regulate e-commerce and fintech services through appropriate legal frameworks
- Fully digitalize public services and transition to a paperless economy

CONCLUSION AND RECOMMENDATIONS



The use of the DELPHI method for developing digital transformation strategies in the context of Uzbekistan proves to be an effective approach for producing scientifically grounded strategic recommendations. The research results show that the growth of the digital economy depends on state policy, the involvement of the private sector, and the development of infrastructure. Through the DELPHI method, a high level of consensus among experts was achieved, and future priority areas for implementation were clearly identified.

Therefore, the most critical directions for Uzbekistan's digital transformation are: expanding IT infrastructure, strengthening cybersecurity, developing e-commerce, and training qualified IT professionals. The strategic approaches developed based on the DELPHI method can serve as key milestones in guiding Uzbekistan's transition toward a sustainable digital economy.

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