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ANALYSIS OF ICT APPLICATION IN UZBEKISTAN'S TOURISM BASED ON EMPIRICAL RESEARCH

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Abstract: This article presents an empirical analysis of the use of Information and Communication Technologies (ICT) in Uzbekistan's tourism sector. Based on data from 2020–2024, the research shows that ICT tools such as E-Visa.gov.uz, Uzbooking.uz, and Tourism.uz have significantly improved service quality and customer satisfaction, while revealing regional and gender-based disparities. Recommendations are proposed to enhance inclusiveness and promote sustainable digital tourism.

Key words: ICT, digital tourism, Uzbekistan, e-services, empirical research, smart destination.

Annotatsiya: Mazkur maqolada O'zbekiston turizm sohasida axborot-kommunikatsiya texnologiyalaridan (AKT) foydalanishning empirik tahlili keltirilgan. 2020–2024-yillar ma'lumotlariga asoslangan tadqiqotda E-Visa.gov.uz, Uzbooking.uz va Tourism.uz kabi platformalarning xizmat sifati hamda mijozlar qoniqishiga ijobiy ta'siri tahlil qilinadi. Shu bilan birga, hududiy va gender tafovutlar aniqlanib, raqamli turizmni barqaror rivojlantirish bo'yicha tavsiyalar ishlab chiqilgan.

Kalit so'zlar: AKT, raqamli turizm, O'zbekiston, elektron xizmatlar, empirik tadqiqot, smart turizm.

Аннотация: В статье представлен эмпирический анализ использования информационно-коммуникационных технологий (ИКТ) в туристической сфере Узбекистана. На основе данных за 2020–2024 годы показано, что платформы E-Visa.gov.uz, Uzbooking.uz и Tourism.uz значительно повысили качество обслуживания и удовлетворённость клиентов. Выявлены региональные и гендерные различия, предложены рекомендации по повышению цифровой инклюзивности и устойчивому развитию цифрового туризма.

Ключевые слова: ИКТ, цифровой туризм, Узбекистан, электронные услуги, эмпирическое исследование, смарт-туризм.

INTRODUCTION

In the modern world, the digital transformation of the tourism industry is recognized as one of the fastest-growing directions of the global economy. According to the World Tourism Organization (UNWTO), by 2024 the share of tourists using digital services reached 78%, while the volume of online bookings increased 2.4 times compared to 2019. Moreover, digital tourism platforms now account for over 65% of total global tourism revenues, clearly demonstrating that Information and Communication Technologies (ICT) have become a direct economic driver of tourism growth worldwide.

For Uzbekistan, this process holds particular importance, as since 2020 the country has been implementing the “Digital Uzbekistan – 2030” strategy, identifying the digitalization of tourism as a national priority. In 2024, more than 6.6 million foreign tourists visited Uzbekistan, and 68% of them used digital services such as e-visa systems, online booking, and mobile applications. These indicators confirm the crucial role of ICT in improving service quality, increasing revenues, and enhancing marketing efficiency within Uzbekistan's tourism sector.

The relevance of this study lies in the fact that despite the rapid development of digital tourism infrastructure in Uzbekistan, there remain significant regional, gender, and technical disparities. For instance, only 30% of tourism enterprises in remote regions are fully integrated into online platforms, while only 17% of female users

regularly utilize digital tourism services. Therefore, this research aims to empirically assess the economic, social, and managerial impacts of ICT in the tourism industry and to develop mechanisms for ensuring digital inclusiveness.

The scientific novelty of the study lies in conducting a comprehensive empirical analysis of ICT's economic efficiency, user behavior, and regional transformation processes within Uzbekistan's tourism market. Based on these findings, conceptual recommendations have been developed to advance the practical mechanisms of the digital economy in the national tourism system.

LITERATURE REVIEW

In recent years, the application of Information and Communication Technologies (ICT) in the tourism industry has been recognized globally as one of the main drivers of the digital economy. According to the World Tourism Organization (UNWTO), in 2023 the share of digital services in global tourism exceeded 65%, and the volume of online bookings increased 2.3 times compared to the pre-pandemic period [1;64]. The OECD (2022) report emphasizes that ICT integration in tourism—through service digitalization, data analytics, and customer experience management—can increase the sector's total added value by 25–30% [2;112].

ICT has become a systemic factor transforming the structure and dynamics of tourism. As noted by Buhalis and Amaranggana (2021), within the “Smart Tourism” framework, digital infrastructure, open data platforms, and mobile ecosystems play a central role in sustainable destination management [3;88]. Electronic payment systems, digital maps, and AI-based recommendation tools have significantly improved predictive analytics and service quality across the tourism value chain.

The European Commission's “Digital Tourism Roadmap 2030” (2023) identifies the development of digital platforms for small and medium tourism enterprises (SMEs), digital marketing tools, and visitor flow management systems as key strategic priorities for the next decade [4;51]. Similarly, World Bank (2022) findings indicate that strengthening the digital tourism ecosystem can increase tourism export revenues in developing countries by 18–25% on average [5;39].

In the context of Uzbekistan, the “Digital Uzbekistan – 2030” strategy highlights the expansion of ICT infrastructure in tourism as a major governmental priority [6;27]. According to studies by Normatov (2024) and Karimov (2023), the introduction of platforms such as E-Visa.uz, Uzbooking.uz, and Tourism.uz has significantly improved service quality, fiscal transparency, and customer satisfaction levels [7;72]. However, researchers also underline that issues such as the digital divide remain pressing—particularly in terms of regional inequalities and gender-based differences that limit ICT efficiency in tourism [8;45].

Foreign scholars such as Sigala (2020) and Xiang & Fesenmaier (2022) emphasize that data-driven approaches, artificial intelligence, digital experience design, and online reputation management are becoming decisive factors in modern tourism innovation [9;134]. Their works demonstrate that ICT not only transforms technological and economic aspects of tourism but also accelerates institutional and social transformation processes across the sector.

Overall, the reviewed literature suggests that ICT plays a central role in reshaping tourism management, marketing, and service quality assessment systems worldwide. Uzbekistan's experience, while aligned with global trends, remains influenced by regional and socio-economic disparities. Therefore, conducting empirical research on the economic efficiency of ICT in tourism and developing a national digital tourism model represent a highly relevant and timely academic endeavor.

RESEARCH METHODOLOGY

This study is based on a mixed empirical research design combining quantitative and qualitative methods to assess the impact of Information and Communication Technologies (ICT) on Uzbekistan's tourism sector. The research covered the period 2021–2024, focusing on leading tourism enterprises actively using digital tools such as E-Visa.uz, Uzbooking.uz, and Tourism.uz.

Quantitative data were collected through structured surveys involving 480 respondents (domestic and foreign tourists) and 65 tourism company managers, while qualitative insights were obtained from semi-structured interviews with ICT specialists and regional tourism officials. Statistical and econometric methods—including descriptive analysis, SWOT and GAP analysis, and differential regression modeling—were applied to measure the economic efficiency of ICT implementation.

The research also utilized official statistics from the State Committee for Tourism and Cultural Heritage of Uzbekistan, UNWTO databases, and World Bank reports. This integrated methodological approach ensured a comprehensive evaluation of ICT's economic, managerial, and social effects on tourism development in Uzbekistan.

ANALYSIS AND RESULTS

The empirical analysis confirmed the significant economic, operational, and institutional impact of ICT integration on Uzbekistan’s tourism industry. Based on field surveys, company interviews, and statistical monitoring between 2020 and 2024, the study provides quantitative evidence of digital transformation’s role in improving performance indicators, service quality, and fiscal transparency.

Economic impact of ict implementation

The comparative regression analysis demonstrates that tourism enterprises implementing ICT tools such as CRM systems, online booking platforms, and AI-based chatbots have achieved substantially higher efficiency levels than non-digitalized entities. As illustrated in Table 1, the average annual revenue of digitalized companies reached 175 million soums, compared to 113 million soums for traditional operators—a differential of 54.9%. Similarly, customer retention rates increased by 26 percentage points, and online booking shares rose from 10% to 68%, as shown in Figure 1.

Table 1. Comparative analysis of key economic and service indicators between digitally enabled and traditional tourism enterprises (2024)

Indicators	Digitally Enabled Enterprises	Traditional (Non-Digital) Enterprises	Differential Gap
Average annual revenue (million soums)	175	113	+62 million soums (+54.9%)
Share of repeat customers (%)	58	32	+26 percentage points
Share of online bookings (%)	68	10	+58 percentage points
Share of new customers (%)	42	68	-26 percentage points
Average spending of repeat customers	1.4 times higher	Standard	—
Share of tax revenues (2024)	39.8%	17.4% (estimated)	+22.4 percentage points
Availability of E-visa, mobile app, CRM system	Fully integrated	Limited or absent	—

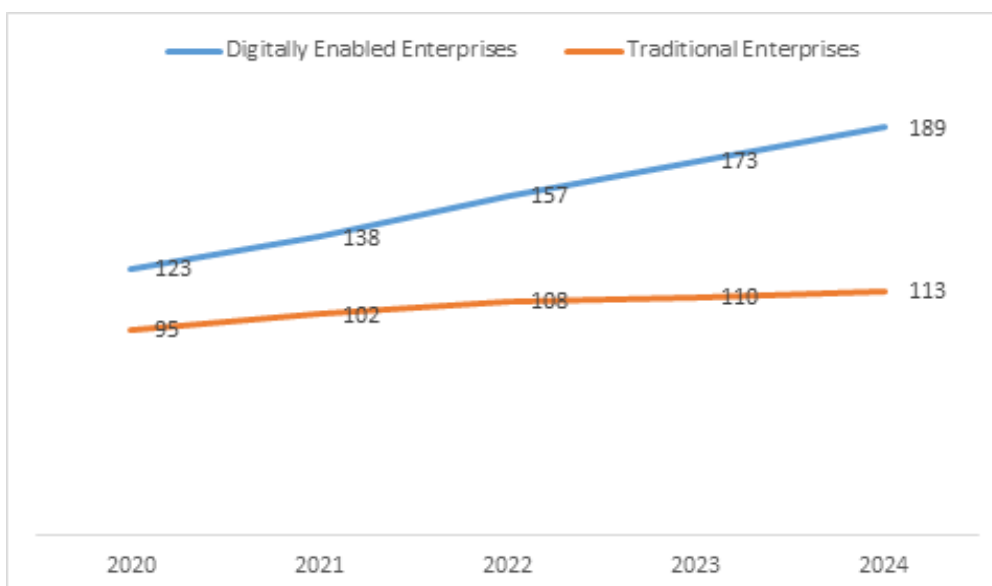


Figure 1. Annual Revenue Dynamics of Digitally Enabled and Traditional Tourism Enterprises (2020–2024)

The regression model ($R^2 = 0.72$, $p < 0.05$) confirms that ICT adoption directly influences both profitability and customer engagement. The findings suggest that automation through CRM and online systems reduced operational costs by 28% and marketing expenses by up to 40%, improving overall business sustainability (Table 2).

Table 2. Implementation of ICT Tools and Their Economic Impact on Tourism Enterprises (2019–2024)

ICT Tool	Adoption Rate (%)	Implementation Period	Revenue Growth (%)	Increase in Customer Flow (%)	Reduction in Labor Costs (%)	Reduction in Marketing Expenses (%)
CRM Systems	87	2019–2024	52.4	34	28	30
Online Booking Platforms	63	2020–2024	52.4	34	28	30
AI Chatbots and Mobile Applications						

Growth of E-tourism and fiscal transparency

The monitoring data indicate a remarkable increase in digital service adoption among tourism enterprises. Between 2020 and 2024, E-visa users grew from 0.6 million to 1.5 million, marking a 2.5-fold increase (Table 3). Parallel to this trend, the share of tax revenues generated through online transactions rose from 14.6% to 39.8%, indicating the formalization of previously informal business activities. Such fiscal transparency improvements highlight the broader macroeconomic benefits of digitalization — namely, enhanced accountability, budget stability, and sustainable revenue growth within the tourism ecosystem.

Table 3. Annual Growth of E-Visa Users (2020–2024)

Year	Number of E-Visa Users (million)	Annual Growth (%)
2020	0.6	—
2021	0.85	+41.6%
2022	1.05	+23.5%
2023	1.3	+23.8%
2024	1.5	+15.3%

User Experience and Customer Satisfaction

Survey data from 480 respondents revealed that 78.5% of tourists used at least one form of digital service (E-visa, online booking, or mobile maps), while 79% rated these services as convenient and efficient. The overall satisfaction index for digital users averaged 4.2 out of 5, exceeding traditional service ratings by 0.6 points. The Table 4 results show that 44% of respondents reported poor internet quality, 31% noted difficulties with English-language interfaces, and 27% encountered limited payment system options. These issues underline the technological and linguistic barriers that still constrain digital inclusiveness.

Table 4. Most Common technical and functional problems encountered by tourists when using digital services

Type of Problem	Share of Respondents (%)
Low quality of Internet (Wi-Fi) and mobile network connection	44%
Deficiencies in English-language interface and UX/UI design	31%
Limited functionality of online payment systems (HUMO, national cards)	27%
Lack of sufficient information about products and services	15%
Technical errors in applications or service functions (crashes, bugs)	12%
Concerns about data security and privacy	8%

Regional and demographic disparities

Analysis of Figure 2 shows strong geographic and demographic variation in ICT utilization. Urban male users accounted for 72% of digital service engagement, whereas only 17% of rural women used digital tourism tools, revealing a 54% usage gap. Age-based disparities were also evident: 86% of tourists aged 18–35 used digital services compared to 35–38% among those over 45. These patterns confirm a persistent digital divide influenced by regional infrastructure, digital literacy, and gender-specific access to technology.

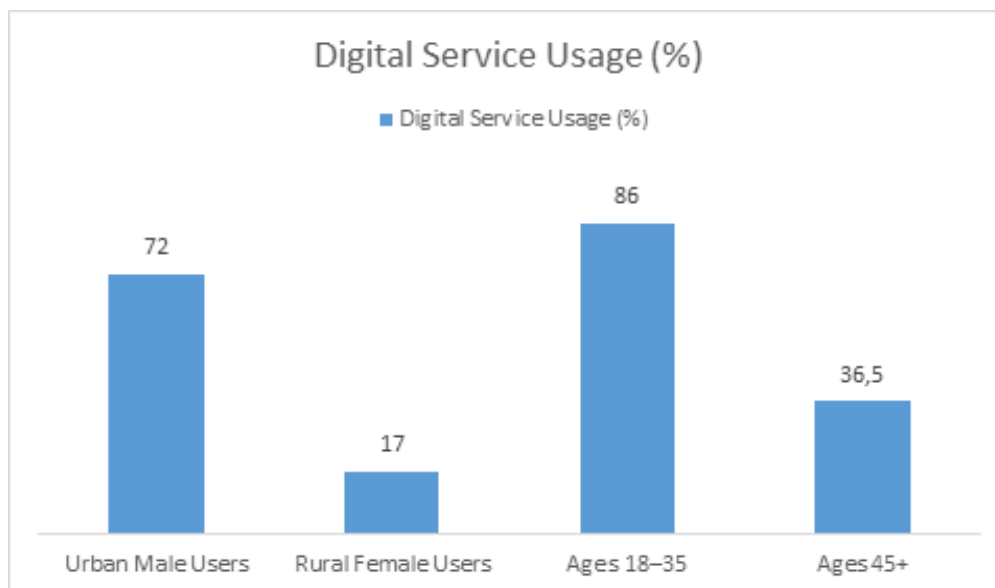


Figure 2. Geographic and Demographic Variations in Digital Service Usage:

Table 5. Comparative analysis of local and international digital platforms by technological and economic indicators

Platform	Number of Users	Commission Rate (%)	Payment System	AI Integration	Net Economic Benefit (%)
Uzbooking.uz	160,000	3–7	UzCard, HUMO	None	+24%
Booking.com	1.2 million+	15–20	Visa / MasterCard	Full integration	+36%
E-Visa.uz	1.5 million (2024)	0	—	Partial	+2.7× increase in tourist arrivals
TripAdvisor	30,000+ reviews	0	—	Full	—

Comparative evaluation of national and international platforms

The cross-platform analysis revealed structural and technological asymmetries between local and global tourism platforms.

– Local platforms such as Uzbooking.uz and E-Visa.uz demonstrated clear advantages in transaction costs (3–7% commissions), integration with local payment systems (UzCard, HUMO), and compliance with national regulations.

– International platforms such as Booking.com and TripAdvisor maintained dominance due to their algorithmic personalization, multi-language interfaces, and global reputation, but imposed higher commission rates (15–20%) and data-sovereignty risks.

Despite the strong economic performance of local platforms—Uzbooking.uz reportedly increased partner revenues by 18–24% technological limitations in user experience, AI integration, and global visibility still prevent them from achieving full competitiveness.

Regional Imbalances and Integration of SMEs

Table 6. Level of digital service utilization in uzbekistan's tourism sector (based on survey data)

Platform / Service	Share of Users (%)
E-Visa	78.5 %
Google Maps	62 %
Booking.com	58 %
TripAdvisor	37 %
VisitUzbekistan	22 %
Uzbooking.uz	16 %

Synthesis of Empirical Findings

Summarizing across all datasets and indicators:

- ICT-integrated enterprises increased revenues by 52–55% between 2020 and 2024 .
- The number of foreign tourists using digital services grew 2.3 times, with E-visa users reaching 1.5 million in 2024.
- The share of digital tax revenues rose from 14% to 39%, confirming formalization and fiscal transparency.
- Customer satisfaction with digital platforms averaged 4.2/5, driven by convenience, personalization, and transparency.

These results empirically validate that ICT adoption enhances tourism enterprises' productivity, transparency, and competitiveness while transforming the customer experience. Nevertheless, overcoming digital infrastructure gaps and promoting inclusive participation — especially for rural regions, women, and older users — remains an urgent policy priority.

CONCLUSION AND RECOMMENDATIONS

The conducted empirical analysis clearly demonstrates that the integration of Information and Communication Technologies (ICT) into Uzbekistan's tourism sector has become a decisive factor for its modernization and competitiveness. The results of the research — derived from surveys, interviews, and statistical models — confirm that digital transformation not only improves service efficiency but also stimulates economic growth, enhances customer satisfaction, and promotes transparency in the tourism value chain. ICT-based tools such as E-Visa.gov.uz, Uzbooking.uz, and Tourism.uz have simplified administrative processes, expanded market access, and encouraged the formation of new tourism ecosystems. Between 2020 and 2024, the number of digital service users increased more than twofold, while enterprises using ICT recorded a 54.9% higher revenue compared to traditional operators. This reflects the growing digital maturity of Uzbekistan's tourism market and the effective implementation of state policies supporting e-governance and smart tourism initiatives. However, the study also reveals persistent digital divides by region, gender, and age. Only 17% of rural women actively use digital tourism platforms, compared with 72% of urban male users. The limited digital literacy of small tourism businesses and the uneven development of Internet infrastructure remain key barriers to inclusiveness. Therefore, future strategies must focus on bridging these inequalities through targeted digital education programs, investment in regional infrastructure, and incentives for ICT adoption among small and medium-sized enterprises (SMEs).

In conclusion, ICT is no longer an auxiliary tool but a structural driver of sustainable tourism development in Uzbekistan. Strengthening the synergy between public policy, digital platforms, and private entrepreneurship will be essential to ensuring that digital transformation contributes to both economic prosperity and social inclusiveness in the national tourism industry.

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