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Raqamli iqtisodiyot
Digital economy
Цифровая экономика



ANALYSIS OF THE PATH TO TOURISM SERVICE INNOVATION IN UZBEKISTAN BASED ON DIGITAL TECHNOLOGY

Zhu YuMing

АНАЛИЗ ПУТИ РАЗВИТИЯ ИННОВАЦИЙ В СФЕРЕ ТУРИСТИЧЕСКИХ УСЛУГ УЗБЕКИСТАНА НА ОСНОВЕ ЦИФРОВЫХ ТЕХНОЛОГИЙ

Чжу Юймин

RAQAMLI TEXNOLOGIYALAR ASOSIDA O'ZBEKISTONDA TURIZM XIZMATLARI INNOVATSIYASINI RIVOJLANTIRISH YO'LINING TAHLILI

Zhu YuMing

Received: May 8, 2026 May: May 12, 2026 May: May 19, 2026 Published: June 1, 2026

Annotatsiya: Ushbu tadqiqot "Bir belbog', bir yo'l" tashabbusi kontekstida raqamli texnologiyalar O'zbekistonda turizm xizmatlari innovatsiyasini qanday targ'ib qilishini o'rganadi. Ushbu tadqiqot qiymat zanjiri modeli va xizmatlar qiymati zanjiri nazariyasini o'zida mujassamlashtirgan keng qamrovli tahlil tizimini yaratadi hamda O'zbekiston turizm sanoatining hozirgi holati va og'riqli nuqtalarini "odamlar, narsalar, makon va taklif"ning to'rt o'lchovidan kelib chiqib tizimli ravishda tahlil qiladi. Bu tadqiqot shuni ko'rsatadiki, byudjet cheklovlari va yetarli infratuzilmaga duch kelgan bo'lsa-da, O'zbekistonning turizm xizmat ko'rsatish sanoati hali ham turli noyob innovatsiya yo'llarini sinab ko'rishi mumkin.

Kalit so'zlar: Raqamli texnologiya, O'zbekiston, turizm xizmatlari, xizmatlar qiymati zanjiri

Аннотация: В данном исследовании рассматривается, как цифровые технологии способствуют инновациям в сфере туристических услуг в Узбекистане в контексте инициативы «Пояс и путь». Данное исследование создает комплексную структуру анализа, которая объединяет модель цепочки создания стоимости и теорию цепочки создания стоимости услуг, а также систематически анализирует текущую ситуацию и болевые точки туристической индустрии Узбекистана с точки зрения четырех измерений «люди, вещи, пространство и предложение». В этом исследовании показано, что, несмотря на бюджетные ограничения и недостаточную инфраструктуру, индустрия туристических услуг Узбекистана все еще может попробовать множество уникальных инновационных путей.

Ключевые слова: Цифровые технологии, Узбекистан, туристические услуги, цепочка создания стоимости услуг

Abstract: This study explores how digital technology promotes tourism service innovation in Uzbekistan in the context of the Belt and Road Initiative. This study constructs a comprehensive analysis framework that integrates Michael Porter's value chain model and service value chain theory, and systematically analyzes the current situation and pain points of Uzbekistan's tourism industry from the four dimensions of "people, things, space, and supply". This study finds that despite facing budget constraints and insufficient infrastructure, Uzbekistan's tourism service industry can still try a variety of unique innovation paths.



Keywords: Digital technology, Uzbekistan, tourism services, service value chain

INTRODUCTION

According to reports from the State Statistics Committee of Uzbekistan and related tourism departments, the country received 11.7 million foreign tourists in 2025, representing a 46.8% increase year-on-year, and tourism service exports reached approximately US\$4.8 billion in 2025⁷.

The rapid growth in international tourist numbers has placed enormous challenges on Uzbekistan's tourism service industry chain, infrastructure capacity, and the sophistication of its tourism products. Shortcomings in the language skills and professional expertise of tourism service personnel, weak digital infrastructure at tourist attractions, and deficiencies in supply chain logistics are becoming increasingly apparent.

In response to these challenges, the Uzbek government has proposed the "Digital Uzbekistan 2030 Strategy," aiming to promote the modernization and digitalization of the industry through top-level national design. However, at the micro level, especially for the numerous small and medium-sized tourism enterprises (SMTEs) within the tourism industry, how to translate the macro-level digital strategy into concrete service innovation remains a pressing issue.

The global tourism market is currently undergoing profound digital transformation. Modern tourists are accustomed to convenient digital experiences, from itinerary planning and online booking to mobile payments and feedback. In contrast, Uzbekistan's tourism services have lagged behind the digital age in many aspects. The imperfect digital payment system forces tourists to carry large amounts of cash; many distinctive family-run guesthouses lack online visibility; and service processes rely heavily on manual operations, resulting in inefficiency and a high risk of errors. These circumstances not only suppress tourists' spending potential but also hinder the extension of the tourism value chain.

Based on Michael Porter's service value chain theory and model, this paper analyzes how Uzbekistan's tourism service industry can utilize digital technology to improve various shortcomings in the tourism service value chain, thereby enhancing the overall value of the entire industry chain, under the realities of budget constraints and insufficient infrastructure.

LITERATURE REVIEW

In recent years, research on the application of digital technology to the tourism service industry has received increasing attention from academia. Existing research on the tourism service industry focuses on sustainable development, service quality improvement, value chain analysis, and digital transformation and innovation.

The research results of Karimov et al. (2025) indicate that the tourism industry in Uzbekistan is experiencing continuous growth and progress. However, some activities and conditions are unsustainable. This unsustainability leads to various adverse consequences, including a lack of digital services and technologies,

overcrowding in popular tourist destinations, insufficient training, and a shortage of human resources. Botir (2024), through interviews with tourism professionals in Uzbekistan travel agencies, understands the specific English language needs and challenges they face, and concludes that English proficiency plays a crucial role in the tourism industry. Usmanovich (2025) proposes further investment in smart tourism solutions, such as real-time visitor tracking and AI-driven crowd control systems, which can significantly improve the visitor experience while ensuring the sustainability of cultural and natural attractions.

Regarding how to improve tourism service quality, many published articles only provide general assessments of tourism expansion, without proposing a so-called multidimensional service quality approach related to international best practices, sustainability, and technological innovation (Ugli, 2025). Digital transformation based on smart tourism systems and forward-looking planning has significantly improved service quality, competitive position, and tourist satisfaction. The overall digital transformation index increased from 0.31 in 2019 to 0.78 in 2024, indicating that a new era of modernization in tourism adaptation and technological implementation has arrived (Ibragimovich, 2025).

The concept of the tourism value chain is adapted from value chain theory, which focuses on all the activities required to bring a product or service from conception to production and delivery to the end consumer (Kaplinsky & Morris, 2000). Value chain theory aims to explore potential leverage points to help build a systematic and competitive value chain, thereby achieving inclusive and sustainable economic growth. Specifically, it involves the appropriate selection and analysis of the entire value chain, the participation of private sector actors as key components, and the promotion and strengthening of sustainable or commercially viable private-sector-led markets, creating a positive economic impact for the target population (SNV, 2010).

Digitalization provides travelers with the favorable conditions of connectivity and convenience, offering a range of innovative solutions and personalized experiences. From immersive virtual tourism to seamless booking processes driven by OTAs, the digitalization of the tourism industry has revolutionized how travelers plan, book, and experience their journeys. This paradigm shift not only improves the efficiency and accessibility of tourism services but also creates new opportunities for destination marketing and revenue generation (Tashpulatova L. M & Suyunova F. B, 2024). Feruz Karimov (2025) explores how technology and artificial intelligence enable inclusive tourism; the rapid development of digital technologies and artificial intelligence (AI) creates new opportunities to reduce barriers in the tourism industry by providing tools such as mobile applications, virtual reality (VR), accessible maps, and AI-driven personalization. Miłosz et al. (2025)

⁷ Uzbekistan National Tourism Committee
<https://ojs.kstu.uz/index.php/ej>



discussed potential directions for leveraging VR to achieve sustainable tourism. This technology can alleviate the burden on popular tourist attractions without sacrificing value for tourists. Lama et al. (2020) pointed out that e-tourism plays a key role in serving tourists by enhancing the travel experience. Small travel service providers in developed economies can effectively utilize e-tourism by partnering with global online platforms such as TripAdvisor or Booking.com. Gretzel et al. (2015) defined the concept of smart tourism, elucidated current trends in smart tourism, and drew attention to the significant research need to inform the development and management of smart tourism. Camilleri et al. (2023) noted that travel businesses can also use chatbot dialogue systems to enhance e-services offered to customers and prospects. Chatbots are introducing novel approaches, reshaping the dynamics between tourists and service providers, and fostering significant behavioral changes across the industry (Calvaresi et al., 2023). Ozturkcan et al. (2025) investigated how QR code menus are becoming a popular and sustainable solution in the hospitality industry. QR code menus offer numerous benefits to restaurants and customers, such as reducing waste, enhancing the customer experience, supporting local and organic food producers, and promoting responsible consumption and production.

While existing research provides abundant material for understanding the digitalization of tourism in Uzbekistan, offering rich descriptions of macro-level policies, research directions, and digital technology development, it falls short in addressing the operational aspects of low-cost digitalization at the micro-service level. This paper, based on the actual situation of Uzbekistan's tourism industry, will comprehensively utilize case studies and literature review methods, combined with the application of value chains in the tourism service industry, to explore in depth the specific paths for digital technology to empower tourism service innovation under budget constraints, aiming to provide theoretical reference and practical guidance for the high-quality development of the country's tourism industry.

METHODOLOGY

This paper explores and modifies the applicability of the value chain model in the tourism industry, and constructs a four-dimensional analysis model of "people, things, space, and supply."

1. Applicability and Modification of Porter's Value Chain Model in the Tourism Industry

Michael Porter's value chain model divides business activities into primary activities and support activities. In the tourism service industry, this model is modified as follows:

Inbound Logistics is transformed into "Information and Access": In manufacturing, the input is raw materials; in the tourism service industry, it is "customer flow" and "information flow." This stage includes tourists obtaining destination information, applying for visas, booking flights and hotels, purchasing attraction tickets, renting vehicles, confirming reception details with external partners, and preparing materials

(itinerary, emergency medicines), etc. Digital technology here plays a role in aggregating information, reducing information asymmetry, improving information interaction, and lowering information access barriers.

Operations are transformed into "Service Scenario Experience": The "production" of tourism products is mainly "experience"—staying in hotels, visiting historical sites, tasting food, and various other experiences. This is the core link in value creation and directly determines tourist satisfaction.

Outbound logistics transforms into "memory and sharing": products are no longer simply delivered to customers; instead, customers leave with an experience and unforgettable memories. This stage involves word-of-mouth marketing, social media sharing, and customer relationship maintenance.

Marketing, Sales & Service: In the digital age, this has evolved into algorithm-based precision marketing.

2. A Four-Dimensional Analysis Model of "People, Things, Space, and Supply"

People: Tourism is a typical high-contact industry. The quality of employees, their language skills, service attitude, and the resulting interaction quality are the most uncertain variables in the service value chain. In Uzbekistan, this dimension corresponds to a labor skills gap.

Objects/Physical Evidence: Due to the intangible nature of services, tourists must rely on tangible cues (physical evidence) to judge service quality. Enhancing the experience of digital "things" (such as the ease of use of app interfaces and the smoothness of electronic payment operations) is crucial.

Space: Tourists move within space. The core content of this dimension includes how to manage the distribution of visitor flow in physical space, avoid simultaneous online activity at popular attractions, how to direct visitor flow to rural areas to tap into the value of rural tourism spaces, and how to enhance the physical space experience through virtual space (VR/AR).

Supply: The back-end supply chain supporting front-end services. This includes things like the procurement of raw materials for hotels and restaurants, and the supply of tourist goods. The efficiency of the supply chain directly affects a company's cost structure and service stability.

RESULTS AND DISCUSSION

The Uzbek government has developed ambitious plans to continuously boost tourism. The government aims to receive 15 million international tourists by 2030 and is committed to further improving infrastructure⁸, increasing air connectivity, and promoting Uzbekistan's rich cultural heritage.

Uzbekistan has relaxed its visa policy, introduced e-visas, and made significant progress in simplifying visa requirements for tourists. By the end of 2025, visa-free access will be available to more than 90 countries⁹. In June 2025, citizens of Uzbekistan and China will be able to enter each other's countries visa-free for stays not exceeding 30 days per visit¹⁰.

⁸ "Uzbekistan-2030 Strategy"

⁹ U.S. Department of Commerce, International Trade Administration
<https://ojs.kstu.uz/index.php/ej>

¹⁰ Chinese Ministry of Foreign Affairs



Uzbekistan is modernizing and expanding its airports to serve more passengers. The government announced plans in 2025 to complete a new Tashkent International Airport by 2030, with an initial capacity designed for 20 million passengers per year¹¹.

Uzbekistan's efforts to expand international routes have also played a key role in the growth of its tourism industry. New direct flights from major international hubs in Europe, the Middle East, and Asia have enhanced the country's accessibility to an unprecedented degree. In July 2025, Uzbekistan reached an agreement with Russia to increase weekly flights from 310 to 1,000. In August 2025, Uzbekistan signed an agreement with China to increase scheduled flights between the two countries to 130 per week¹². Uzbekistan hopes to attract one million Chinese tourists, a figure that reached 278,900 by 2025¹³. As a result, the number of tourists visiting Uzbekistan is steadily increasing, not only from neighboring countries such as Kazakhstan, Kyrgyzstan, and Tajikistan, but also from more distant countries and regions such as the United States, France, and China.

Uzbekistan boasts a rich cultural heritage, with cities like Samarkand, Bukhara, and Khiva being popular tourist destinations. These cities, once important nodes on the ancient Silk Road, are renowned for their stunning architecture, including mosques, mausoleums, and monasteries.

In 2025, Uzbekistan continued to promote its cultural assets as a major attraction for tourists. While protecting and restoring historical landmarks, the country also focused on showcasing its rich traditional culture, attracting culture enthusiasts and history buffs from around the world. Government initiatives to promote cultural tourism, such as opening new museums and developing Silk Road-themed tours, successfully drew large numbers of tourists eager to experience the country's history firsthand.

While Uzbekistan has long been known for its historical sites, the country is increasingly diversifying its tourism offerings. Ecotourism, adventure tourism, and gastronomy tourism are gaining popularity among international tourists. The government's strong promotion of outdoor activities such as trekking, mountaineering, and nature exploration is attracting numerous visitors to explore Uzbekistan's beautiful natural landscapes, including the Fergana Valley and the Aral Sea region.

The government is also actively promoting pilgrimage tourism. Officials are working to increase flight frequency to Uzbekistan from Indonesia, Malaysia, India, Pakistan, Bangladesh, and the Middle East, train qualified guides, and improve transportation and road infrastructure leading to pilgrimage sites. The country boasts over 1,200 holy sites and could attract up to one million pilgrims annually¹⁴.

Despite impressive macro-level data, Uzbekistan's tourism industry suffers from significant structural shortcomings in all four dimensions mentioned above at the micro-level of service delivery.

The "human resource" deficiency: The supply of professional talent lags far behind the pace of infrastructure development, particularly in areas such as language proficiency, digital skills, and vocational training. While high-end hotels in major cities like Tashkent offer multilingual services, English proficiency remains low in secondary service areas of core tourist cities like Samarkand and Bukhara, as well as in promising ecotourism regions. There is a severe shortage of Chinese-speaking tour guides targeting China, a major growth market, hindering in-depth cultural explanations and limiting tourist experiences to superficial sightseeing. Digital skills among tourism professionals are generally weak. Many lack basic skills in using online ordering systems, managing digital inventory, or conducting social media marketing. This skill gap prevents many high-quality local tourism resources from accessing the global digital network. In recent years, Uzbekistan has established some high-quality educational institutions offering tourism and hospitality management courses. However, the vocational education system still does not fully cover entry-level service positions. Service personnel often lack systematic and standardized training, resulting in inconsistent service quality that fails to meet international tourists' expectations for professional service. Digital literacy and foreign language proficiency are the main skills gaps employers have identified among their young employees. Approximately two-thirds of companies complain that their young staff lack technical and soft skills, particularly computer skills and foreign language proficiency.

The "material" aspect is also lacking: Uzbekistan boasts numerous historical buildings dating back millennia, but supporting service facilities and digitalization have lagged behind. At many World Heritage sites, physical signage is outdated, uses only a single language, and lacks digital support services such as QR codes and audio guides, hindering tourists' understanding of the historical origins of cultural heritage and limiting interactive and in-depth educational exchanges at sites. Payment convenience is a crucial aspect of the international tourist experience. While international payment organizations like Visa and Mastercard are widely available in major Uzbekistan venues, the two dominant local payment systems are Uzcard and Humo. Many small businesses, taxis, and local attractions only accept local cards or cash, forcing international tourists to frequently carry large amounts of cash, significantly reducing transaction convenience and security, and impacting tourist satisfaction. The "spatial" deficiency: Tourists are distributed very unevenly across the country. Popular attractions such as Registan Square in Samarkand and the Old City of Bukhara face overcrowding during peak seasons. Excessive congestion reduces the tourist experience. Meanwhile, rural and ecotourism resources with huge potential (such as the nomadic culture of Karakalpakstan and agricultural tourism in the Fergana Valley) remain unknown to tourists due to a lack of digital channels for presentation.

¹¹ Presidential Press Service of Uzbekistan

¹² Ministry of Transport of Uzbekistan

<https://ojs.kstu.uz/index.php/ej>

¹³ Uzbekistan Statistics Committee

¹⁴ U.S. Department of Commerce Travel Guide



Tourists often lack information on attractions, transportation, accommodation booking, and safety guidelines, making it difficult for these areas to benefit from tourism.

The "supply" deficiency: Some hotels and restaurants still rely on manual market procurement of ingredients and supplies, lacking modern B2B digital procurement platforms. This not only leads to opaque and inefficient procurement costs but also makes it difficult to trace food safety. Furthermore, some small and medium-sized enterprises face insufficient funds to procure sufficient goods in advance.

Based on the aforementioned deficiencies in "people, resources, space, and supply," this article will delve into how to reconstruct the tourism service industry value chain in Uzbekistan through digital technology.

Regarding the shortage of human resources, AI-assisted language services can be used to compensate. Deploying AI-based real-time translation devices and software is an efficient option. For example, smart terminals supporting multilingual translation between Uzbek, Chinese, English, and Russian can be deployed in tourist service centers and hotel front desks. The language proficiency of service personnel can be improved through micro-training systems, such as using instructional videos on mobile internet platforms (e.g., Telegram channels, YouTube educational channels) to provide vocational skills training for rural tourism practitioners. This model is low-cost, has wide coverage, and can rapidly improve the hospitality knowledge and basic digital skills of service personnel. International organizations (such as UNESCO and USAID) have already implemented similar digital literacy improvement projects locally, using blended learning models to compensate for the shortcomings of traditional educational resources.

Regarding the shortage of resources, the transformation from physical assets to digital assets should be strengthened. Telegram software has a very high usage rate in Uzbekistan, and it is becoming possible to complete service bookings and payments directly through Telegram bots. In China, WeChat is the most widely used instant messaging app, used for both instant communication and booking hotels and attraction tickets via WeChat mini-programs, and completing payments. This "chat, book, pay" model can significantly reduce hardware investment costs for Uzbekistan's tourism industry and serves as an effective reference path for payment solutions. Simultaneously, efforts will be made to enhance the experience of virtual reality (VR) and augmented reality (AR). For cultural heritage buildings, AR technology can recreate the historical appearance of ancient sites on a mobile phone screen without touching the artifacts.

Addressing the lack of "space," digital technology will be strengthened to break down the limitations of physical space and optimize resource allocation. Regarding smart visitor flow management and e-ticketing, Uzbekistan will launch a fully functional mobile application and a unified national tourism platform in 2026, enabling real-time monitoring and reservation management of visitor flow at core scenic spots. Dynamic pricing and time-slot reservations can

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effectively smooth out peak and off-peak periods, alleviating congestion at popular attractions. This will help manage tourist numbers more efficiently, providing a smoother experience for everyone. The introduction of an online booking system will also help tourists plan their trips more effectively, thereby reducing the likelihood of overcrowding at popular attractions.

In terms of digital mapping and rural navigation, the integrated use of Google Maps, Yandex Maps, and local navigation applications (such as 2GIS) allows for precise location of tourist attractions, whether in large cities like Tashkent or in the intricate Maharaja (traditional neighborhoods) of Bukhara and Samarkand. While Google Maps might get lost in rural areas, 2GIS provides more accurate navigation. Improving geo-tagging and route planning for remote attractions allows self-driving tourists and backpackers to confidently explore the heart of rural areas. This improved digital infrastructure essentially integrates untapped physical spaces into the tourism economy.

Addressing the supply-side deficiencies, a B2B digital marketplace focused on the hotel and catering industry has been established. This allows small and medium-sized guesthouses to purchase standardized items such as linens, toiletries, and ingredients directly from farmers or wholesalers through the platform, just like large hotels, significantly reducing procurement costs.

Most tourism operators in Uzbekistan are small and medium-sized enterprises with limited financial resources, making it impossible to afford expensive enterprise-level software (such as SAP). Therefore, this study specifically emphasizes the "low-cost innovation" approach, which leverages existing, free, or low-cost digital tools to improve service quality.

Given Telegram's high penetration rate in the area, developing lightweight service mini-programs based on Telegram is a cost-effective option. Telegram provides developers with a complete Bot API and Mini App development toolkit, supporting the use of standard web technologies (HTML/CSS/JS, React, Vue, etc.) to build applications. These applications run smoothly within Telegram's embedded WebView, making Telegram more than just a communication tool; it becomes a node connecting services such as accommodation booking, transportation, and food delivery. Small and medium-sized enterprises should prioritize establishing official channels on Telegram rather than rushing to develop their own apps.

Considering the maturity and low cost of QR code technology, it is ideal for connecting offline scenarios with online services. Restaurants can use free QR code generators to replace paper menus with digital ones. This not only saves printing costs but also allows for real-time updates to menus and prices. In Samarkand, it's common to find that some dishes are no longer available, yet the menu remains unchanged. QR codes also easily enable multilingual switching (such as one-click switching between Chinese/English/Russian), greatly facilitating use by international tourists. Furthermore, guesthouses or small museums only need to post a QR code on the wall; tourists can scan it to access multilingual guided videos on YouTube, easily replacing expensive audio guide



hardware. This method greatly enriches the information dimension of the "things" and enhances the tourist experience.

In addition, it's crucial to emphasize the decentralization of content marketing. Advertising requires significant funds, and for SMEs with limited budgets, leveraging user-generated content (UGC) is a better strategy. Through simple interior design, create visually impactful "Instagram" or "TikTok" zones within hotels or restaurants to encourage tourists to take photos and share. This is a zero-cost viral marketing strategy. Furthermore, strengthen collaborations with travel influencers. SMEs lack the budget to invite big-name celebrities for endorsements; instead, they can invite travel influencers to experience their establishments through resource exchanges, such as providing free meals or accommodation. These authentic experiences are more persuasive to the target audience. Finally, enhance the flexible application of low-code and no-code tools. Use Canva to create professional posters, Notion to create landing pages, and Google Forms to collect customer feedback. Most of these tools offer free basic versions, which can fully meet the daily operational and marketing needs of small and medium-sized enterprises, significantly reducing the technical and financial barriers to digitalization.

CONCLUSION

This study demonstrates that many parts of the value chain can be improved through low-cost digital technologies, leading to multi-point innovation, enhancing the overall quality of the service value chain, strengthening the global competitiveness of Uzbekistan's tourism service industry, and creating more wealth for the country.

For policymakers, the focus is gradually shifting from simply being "infrastructure builders" to "digital ecosystem builders." This includes implementing digital subsidy policies for small and medium-sized enterprises (SMEs) in the tourism industry, funding their self-built or purchased basic digital services; and collaborating with universities and international organizations to conduct large-scale digital technology training.

Looking ahead, low-barrier digital technology tools will be widely adopted. From merchants using QR code menus and navigation to the interconnection of international payment gateways, many current shortcomings will be effectively addressed through low-cost technologies. With the launch of the "National Unified Tourism Platform," data from multiple channels, including visas, transportation, ticketing, catering, and accommodation, will be integrated and re-integrated. Upgrades to B2B digital supply chain platforms will also drive SMEs in the tourism service industry towards digital operations. Through these digital technology pathways, Uzbekistan's tourism industry will complete a remarkable transformation from resource-based tourism to digitally innovative tourism.

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