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Article

The Impact of Digital Tourism Technologies on the Attractiveness of Cultural Heritage Sites and Population Employment

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Abstract: This article analyses the channels through which digital tourism tools — 3D modelling, virtual tours, e-ticketing, geolocation services and online marketing — influence the attractiveness of cultural heritage sites and local employment. The study is based on a secondary analysis of Uzbekistan's official inbound tourism statistics for 2021–2025, the results of cultural heritage digitisation in 2025, and regulatory documents. The results show growth in both visitor numbers and digital infrastructure indicators; however, these parallel changes cannot be interpreted as a direct causal effect of digitisation. Monitoring indicators and a regional evaluation design are proposed for measuring local employment outcomes.

Keywords: Digital tourism, cultural heritage, 3D model, virtual tour, destination attractiveness, employment, e-ticketing.

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1. Introduction

Cultural heritage sites are among the key resources in the value chain of tourism services [1]. Their attractiveness is determined not only by historical uniqueness but also by how easily visitors can find clear information about a site, reach the destination, buy a ticket, understand the content of a guided tour and share their impressions with others [2]. Digital technologies can reduce the costs of these processes and bring services to new audiences [3]. At the same time, the outcome of technological upgrading depends largely on the degree of linkage with local services [4], [5].

In Uzbekistan, the development of tourism and cultural heritage is increasingly aligned with digital transformation policy. The "Digital Uzbekistan — 2030" Strategy sets the development of information systems in the economy and social sphere as a priority [6], while the resolution on the activities of the Tourism Committee identifies the digitisation of tourist sites and the diversification of tourism services as one of the main directions [7]. The Law on the Protection and Use of Cultural Heritage Objects provides the institutional basis for balancing use and preservation [8].

The research problem is that the introduction of digital technology and an increase in tourism revenue or employment are often treated as one and the same outcome. In fact, the use of a digital platform is a process indicator, whereas visits, spending, jobs and wages are distinct economic outcomes [9], [10]. The aim of this article is to systematise the mechanisms through which digital tourism affects attractiveness and employment, to compare official open indicators, and to develop testable evaluation criteria.

In academic literature, digital tools such as virtual reality (VR), 3D modelling, augmented reality (AR), and smart ticketing are acknowledged not merely as promotional vehicles, but as strategic mechanisms that reduce information asymmetry for international travelers [11]. According to prior studies, the pre-visit engagement generated through virtual tours directly shapes tourist expectations and enhances destination choice satisfaction [12].

From an economic perspective, technological adoption in tourism value chains creates both direct and indirect multiplier effects on local economies [5], [9]. Direct effects manifest in the creation of specialized technical jobs (e.g., content managers, digital modellers, system integrators), while indirect effects stem from increased tourist stay durations and spending on local crafts, gastronomy, and guiding services [13]. However, scholarly consensus highlights that without explicit integration between digital booking platforms and local micro-enterprises, economic leakage occurs, minimizing local employment gains [14], [15].

In Uzbek sources, the institutional, data and service-delivery aspects of digital tourism are covered in various documents. The official statistical database provides a time series of inbound trips for tourism purposes [16]. The separation of arrivals for leisure and recreation into a distinct category makes it possible to distinguish the cultural tourism market segment from total visits [17]. Official information published in 2024 points to the need to track dynamics across seasonal periods [18].

The Cultural Heritage Agency's data on the results of 2025 reflect the expansion of the electronic database, museum collections, 3D models, virtual tours and e-tickets [19]. The Tourism Committee's annual report notes the pilot launch of the "Tourist map" portal [20]. The contribution of higher education institutions to preparing regional tour packages and multilingual digital content demonstrates the link between tourism marketing and skills development [21]. The improvement of electronic administrative services in the cultural heritage sector, in turn, creates opportunities to increase the transparency of procedures [22].

The main limitation of the reviewed sources is the lack of publicly available panel data that combine visitor numbers for digitised sites with the new jobs created specifically around those sites. Therefore, this article does not make strong empirical claims about causality; its outcome consists of descriptive statistics and an evaluation methodology.

2. Materials and Methods

The research design is a descriptive-analytical and comparative secondary data analysis. The first data group covers the number of foreign citizens who entered the Republic of Uzbekistan for tourism purposes in 2021–2025 [16]. The second group includes administrative data on digital resources created or launched within the cultural heritage system in 2025 [19]. The third group consists of regulatory documents and departmental information governing tourism, cultural heritage and digitisation [68, 20–22].

The stages of the analysis are as follows: (1) bringing indicators to common units; (2) calculating annual changes; (3) theoretically separating the technology–service–spending–employment chain; (4) developing indicators for future site-level monitoring. The annual growth rate was calculated using the formula $g_t = (V_t/V_{t-1} - 1) \times 100$, where V is the number of foreign tourist visits. This is a national-level indicator and does not represent growth in visits to any particular monument.

The recommended employment outcome indicators are: direct staff positions associated with the site, persons employed in guiding and interpreting services, new jobs in handicraft and catering enterprises, seasonal working days, formalised employment contracts, and employees' real income. To isolate the effect of digitisation, it is advisable to use before–after comparisons of similar digitised and non-digitised sites and, where

possible, the difference-in-differences method. Since such microdata were not available for this article, regressions and p-values were not calculated.

3. Results

Table 1. Foreign visits to Uzbekistan for tourism purposes, 2021–2025

Year	Visits, thousand people	Growth over previous year, %
2021	1,881.3	—
2022	5,232.8	178.1
2023	6,626.3	26.6
2024	7,957.2	20.1
2025	11,679.6	46.8

Source: author's calculations based on SIAT data of the National Statistics Committee [16]. The sharp recovery in 2021–2022 also reflects the post-pandemic base effect.

According to Table 1, the number of foreign tourist visits increased from 1.88 million in 2021 to 11.68 million in 2025. In 2025, the indicator grew by approximately 46.8% compared with 2024. However, these dynamics may also have been influenced by transport connections, border regimes, external demand, infrastructure, advertising and other macroeconomic factors. Therefore, attributing the growth solely to 3D tours or e-ticketing services would be methodologically incorrect [16, 18].

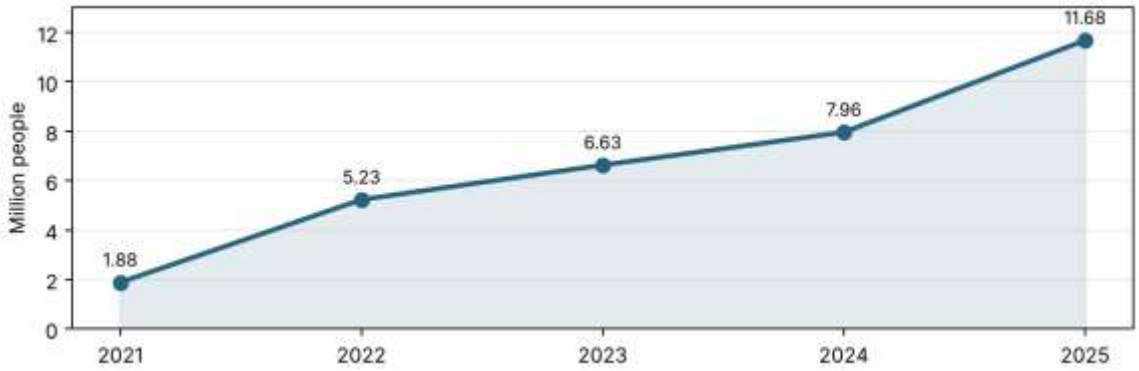


Figure 1. Dynamics of foreign tourist visits, million people

Figure 1 shows that the visitor market is expanding. As market size grows, the online visibility of heritage sites, multilingual descriptions and booking systems broaden the opportunities for selling services. However, site attractiveness should be measured separately through the conversion rate from internet searches to actual visits, length of visit, share of repeat visits and visitor satisfaction.

Table 2. Digitisation results in the cultural heritage system, 2025

Indicator	Result in 2025	Interpretation
Heritage sites in the electronic database	More than 8,000	Information coverage
Museum items in the digital catalogue	1,884,213	Digital availability of collections
3D models of historical sites	More than 120	Remote visualisation
360° virtual tours	About 100	Advance familiarisation
E-tickets	More than 320,000	Transaction channel
Museums with electronic ticket offices	68	Payment infrastructure

Source: results of the Cultural Heritage Agency for 2025 [19]. The indicators are measured in different units and cannot be directly compared as percentage shares or as measures of economic efficiency.

Table 2 indicates that digital coverage has developed simultaneously in the areas of information, visual content and transactions. The number of sites in the electronic database makes cultural resources easier to find, while 3D models help visitors choose routes before a visit. E-tickets and electronic ticket offices generate additional data for managing opening hours and counting visitor flows. At the same time, 320,000 e-tickets cannot be counted as jobs or as the number of additional tourists.

Figure 2. Selected digital infrastructure indicators, 2025

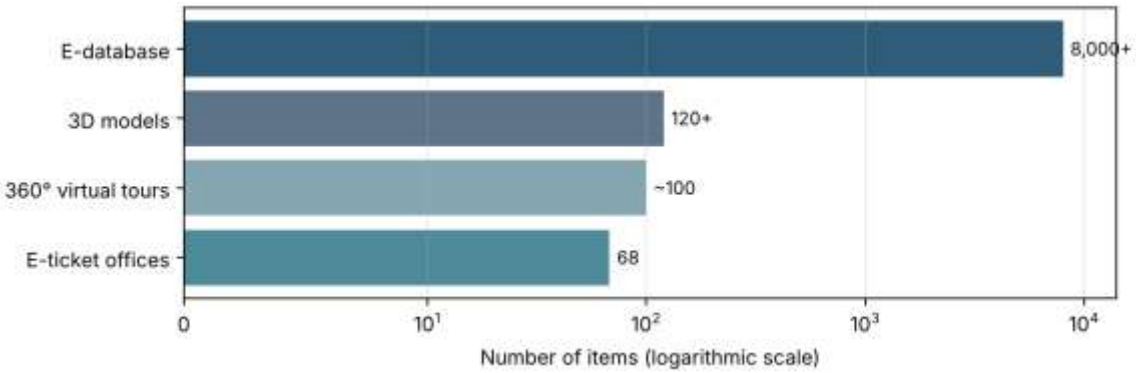


Figure 2 uses a logarithmic scale to illustrate the sharp differences in magnitude between indicators of different types. The chart reflects differences in the coverage of digitisation areas rather than a causal effect or the superiority of one technology over another. To increase attractiveness, it is important to link an extensive database with multilingual commentary, high-quality navigation, mobile responsiveness and payment options.

4. Discussion

Digital tools can affect attractiveness through four main channels. The first is reducing information uncertainty: accurate opening hours, ticket prices, transport routes and site history make trip planning easier. The second is enriching the experience: audio guides, 3D reconstructions and interactive tours make complex historical content understandable. The third is integrating sales channels: when online tickets, local guides and workshop services are offered on a single platform, the likelihood that local value added remains in the region increases. The fourth is data-driven management: analysing visitor flows by day and hour can reduce queues and overcrowding [19, 20].

A positive effect on employment does not occur automatically. Digital advertising may generate visitor flows, but if tourists do not use the craft shops, family guesthouses, catering outlets or local guide services around the site, growth in local income will be limited. For this reason, the mechanism linking tourist orders to local suppliers should occupy a central place in digital tourism policy. The experience of educational institutions in producing tour packages and multilingual content provides an organisational basis precisely for this direction [21].

On the other hand, digitisation automates certain routine tasks: the volume of cashier work, information provision and paper-based record-keeping may decrease. As a result, the net employment effect depends on the difference between newly created jobs and reduced job functions. Upskilling is essential for IT specialists, digital content editors, restoration modellers, audio guide writers and online customer support specialists. Not only the number of jobs, but also wages, seasonal stability and the participation of women and young people should be evaluated.

Table 3. Digital tourism–employment chain and monitoring indicators

Digital solution	Expected intermediate outcome	Employment evaluation indicator
Virtual tour and 3D model	Interest in travel, route selection	Number of guide service bookings
E-ticket	Booking convenience, flow reporting	Working hours in site services
Geo-map and multilingual content	New market audience	Share of referrals to local services
Online handicraft sales	Post-visit purchases	Artisans' income and employment
Audio guide and digital education	Quality of experience, inclusiveness	Contracts in content creation

Table 3 is a conceptual classification proposed by the author for practical monitoring; the outcomes it lists are not observed statistical values. If data are collected for at least 12 months before and after digitisation, seasonality and regional differences can be controlled for. For example, it would be advisable to compare the period of e-ticket introduction in groups of similar sites in Samarkand, Bukhara and Khorezm with a control group, while also accounting for transport and marketing costs. Such a design requires anonymised data on visits, service providers' revenues and formal jobs.

For sites with fragile heritage, unlimited growth in tourist demand is not the goal. A digital booking system can distribute visits over time, and virtual tours can remotely display areas where physical access is restricted. At the same time, information security, copyright, personal data protection and the scientific accuracy of historical interpretation must be monitored. The legal regime of cultural heritage and digital public services set the requirements for this balance [8, 22].

5. Conclusions and Practical Recommendations

The analysis showed that foreign tourist visits to Uzbekistan grew significantly in 2021–2025 and that the digital infrastructure of cultural heritage expanded in 2025 [16, 19]. However, national-level growth does not mean that an independent causal effect of digital tourism on attractiveness or population employment has been proven. The most promising mechanism is building a value chain that links digital information about a site to actual visit sales, and from there to local services and paid activities.

In practical terms, first, a unified digital passport, a multilingual page, a convenient route and an online ticketing system should be integrated for every significant heritage site. Second, it is advisable to enable the optional addition of local guide, handicraft and catering services to online tickets. Third, project effectiveness should be evaluated not only by the number of visits but also by local income, new jobs, visitor satisfaction and the state of preservation of heritage sites. Fourth, short courses in digital literacy and foreign languages should be tailored to artisans, women and young people.

A limitation of the study is the absence of site-level primary survey data and employment panel data. Future research is recommended to identify the net change in employment by comparing digitised sites with control groups.

REFERENCES

[1] R. Buhalis and M. Law, "Progress in information technology and tourism management: 20 years on and 10 years after the Internet—The state of eTourism research," *Tourism Management*, vol. 29, no. 4, pp. 609–623, 2008.

[2] D. Guttentag, "Virtual reality: Applications and implications for tourism," *Tourism Management*, vol. 31, no. 5, pp. 637–651, 2010.

[3] F. Neuhofer, D. Buhalis, and A. Ladkin, "Conceptualising technology enhanced destination experiences," *Journal of Destination Marketing & Management*, vol. 1, no. 1–2, pp. 36–46, 2012.

[4] S. K. Dixit, *The Routledge Handbook of Consumer Behavior in Hospitality and Tourism*, London, U.K.: Routledge, 2017.

[5] Tourism Committee of the Republic of Uzbekistan, "A new start-up project on digitising tourism infrastructure was presented," 2026. [Online]. Available: https://gov.uz/oz/uzbektourism/news/view/167155

[6] President of the Republic of Uzbekistan, "On approval of the 'Digital Uzbekistan — 2030' Strategy and measures for its effective implementation," Decree No. PF-6079, Oct. 2020. [Online]. Available: https://lex.uz/uz/acts/-5030957

[7] President of the Republic of Uzbekistan, "On measures to organise the activities of the Tourism Committee of the Republic of Uzbekistan and accelerate the development of the tourism sector," Resolution No. PQ-348, 2025. [Online]. Available: https://lex.uz/uz/acts/-7851788

[8] Republic of Uzbekistan, "On the protection and use of cultural heritage objects," Law No. 269-II, 2001. [Online]. Available: https://lex.uz/uz/acts/-25461

[9] X. Font and S. McCabe, "Sustainability and marketing in tourism: Its contexts, paradoxes, approaches, challenges and ways forward," *Journal of Sustainable Tourism*, vol. 25, no. 7, pp. 869–883, 2017.

[10] J. H. Stock and M. W. Watson, *Introduction to Econometrics*, 4th ed., New York, NY, USA: Pearson, 2019.

[11] Tourism Committee of the Republic of Uzbekistan, "Cooperation on developing digital technologies and infrastructure in the tourism sector was discussed," June 5, 2026. [Online]. Available: https://gov.uz/oz/uzbektourism/news/view/173996

[12] M. K. Bec, B. Moyle, T. Timms, V. Schaffer, L. Skavronskaya, and me. Little, "Virtual reality in heritage management: Analysing its effectiveness for heritage site preservation," *Journal of Heritage Tourism*, vol. 16, no. 3, pp. 245–257, 2021.

[13] M. E. Porter, *Competitive Advantage: Creating and Sustaining Superior Performance*, New York, NY, USA: Free Press, 1985.

[14] World Tourism Organization (UNWTO), *Digital Transformation in Tourism: Technologies and Opportunities*, Madrid, Spain: UNWTO, 2019.

[15] OECD, *OECD Tourism Trends and Policies 2024*, Paris, France: OECD Publishing, 2024.

[16] National Statistics Committee of the Republic of Uzbekistan, "The number of inbound tourist trips by foreign citizens to the Republic of Uzbekistan (total): SIAT time series," 2026. [Online]. Available: https://siat.stat.uz/data/1038/?lang=en

[17] National Statistics Committee of the Republic of Uzbekistan, "Number of inbound tourist trips by foreign citizens to the Republic of Uzbekistan for leisure and recreation," 2026. [Online]. Available: https://siat.stat.uz/data/1012/?lang=ru

[18] National Statistics Committee of the Republic of Uzbekistan, "How many foreign tourists visited Uzbekistan?," Oct. 30, 2024. [Online]. Available: https://stat.uz/uz/matbuot-markazi/qo-mita-yangiliklar/57858-o-zbekistonga-

[19] Cultural Heritage Agency of the Republic of Uzbekistan, "Work carried out in ICT and digitisation in 2025," Infographic, Mar. 5, 2026. [Online]. Available: https://gov.uz/oz/madaniymeros/news/view/143012

[20] Tourism Committee of the Republic of Uzbekistan, "2025 — a year of a new stage and high results in the tourism sector," 2026. [Online]. Available: https://gov.uz/oz/uzbektourism/news/view/142186

[21] Tourism Committee of the Republic of Uzbekistan, "Work carried out by higher education institutions in the tourism sector in 2025, in figures," Jan. 15, 2026. [Online]. Available: https://gov.uz/oz/uzbektourism/news/view/120321

[22] Cultural Heritage Agency of the Republic of Uzbekistan, "The Government approved administrative regulations in the field of cultural heritage," Aug. 15, 2025. [Online]. Available: https://gov.uz/oz/madaniymeros/news/view/78204