

## RAQAMLI TURIZM TEXNOLOGIYALARI VA ULARNING IQTISODIY SAMARADORLIKKA TA’SIRI

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**Annotation:** *This article examines the rapid development of digital tourism technologies and their impact on the economic efficiency of the tourism industry. The scientific analysis of the integration of digital platforms, online booking systems, mobile applications, virtual and augmented reality (VR/AR) technologies, and digital marketing tools into the tourism sector has led to improved service quality, reduced costs, and increased tourist arrivals. It also highlights the reforms being carried out in Uzbekistan to develop digital tourism and their impact on regional economic activity and competitiveness. The research results show that the effective implementation of digital technologies is an important factor in the sustainable development of the tourism industry and improving economic performance.*

**Annotatsiya:** *Ushbu maqolada raqamli turizm texnologiyalarining jadal rivojlanishi va ularning turizm industriyasi iqtisodiy samaradorligiga ko‘rsatgan ta’siri o‘rganiladi. Raqamli platformalar, onlayn bron tizimlari, mobil ilovalar, virtual va qo‘shimcha reallik (VR/AR) texnologiyalari hamda raqamli marketing vositalarining turizm sohasiga integratsiyalashuvi natijasida xizmatlar sifati oshgani, xarajatlar kamaygani va sayyohlar oqimi ko‘paygani ilmiy tahlil qilinadi. Shuningdek, O‘zbekistonda raqamli turizmni rivojlantirish bo‘yicha olib borilayotgan islohotlar, ularning mintaqaviy iqtisodiy faollik va raqobatbardoshlikka ta’siri yoritiladi. Tadqiqot natijalari raqamli texnologiyalarni samarali joriy etish turizm industriyasining barqaror rivojlanishi va iqtisodiy ko‘rsatkichlarning yaxshilanishida muhim omil ekanini ko‘rsatadi.*

**Key words:** *Digital tourism, digital technologies, economic efficiency, online booking systems, mobile applications, virtual reality (VR), augmented reality (AR), digital marketing, tourism industry, innovative services, tourist flow, e-tourism.*

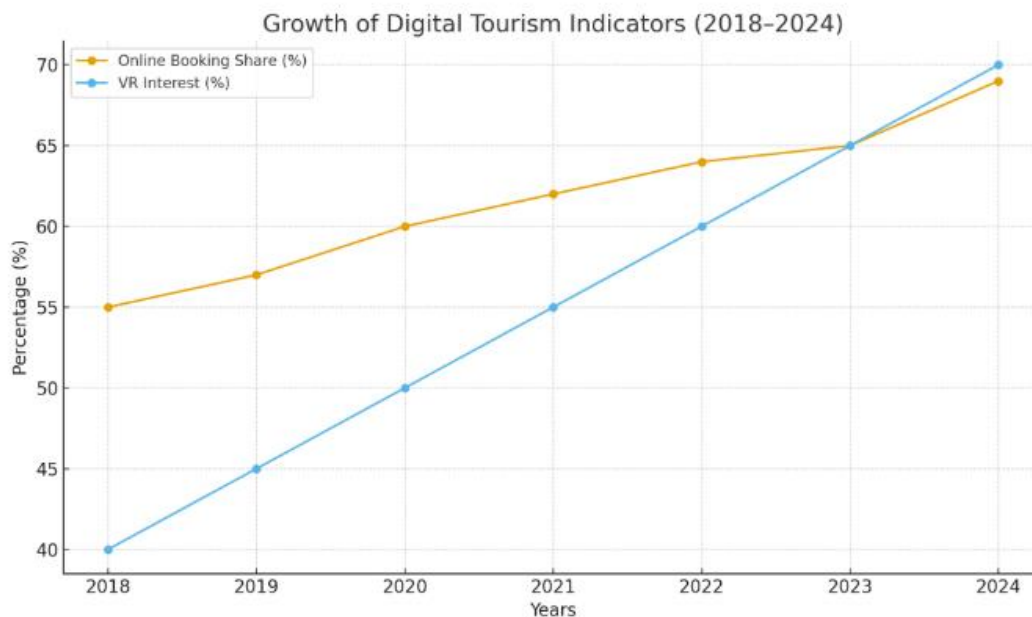
This article explores the rapid development of digital tourism technologies and evaluates their impact on the economic efficiency of the tourism industry. Digital platforms, online booking systems, mobile applications, virtual and augmented reality tools, and data-driven marketing strategies are analyzed as key drivers that increase service quality, reduce operational costs, and expand tourist flows. The research also examines Uzbekistan’s digital tourism reforms and their influence on competitiveness and regional economic growth. The findings demonstrate that effective integration of digital technologies significantly enhances the sustainability and economic performance of the tourism sector.

In recent years, digitalization has become one of the most influential forces shaping the global tourism industry. The rapid penetration of information technologies into travel services

has transformed how tourists search, book, purchase, and experience destinations. According to the World Tourism Organization (UNWTO), over 70% of global travelers use digital tools when planning trips, and more than 60% make bookings online. This shift has elevated efficiency, reduced transaction costs, and strengthened tourism companies’ competitiveness.



For developing countries such as Uzbekistan, digital tourism technologies have become a strategic priority. National programs such as “Digital Uzbekistan – 2030” and large-scale reforms in the tourism sector are contributing to improved service quality and increased international tourist inflows. In this context, analyzing the economic effects of digital transformation is essential for understanding future development opportunities.



In recent years, the tourism industry has been recognized as one of the fastest growing sectors in the global economy. According to the World Tourism Organization (UNWTO), tourism will account for about 9 percent of global GDP in 2024 , and it is growing in importance as a major economic sector that employs hundreds of millions of people worldwide.

According to the results of the correlation and regression analyses, a clear negative relationship was found between the share of the tourism sector in the global economy and the unemployment rate during the period 2015–2024. This means that as the economic activity of the tourism sector increased, the unemployment rate showed a tendency to decrease.

The correlation coefficient value is around -0.85, which indicates a strong inverse relationship between these two indicators. That is, during periods when the share of tourism in GDP increased, the demand for labor increased and, as a result, the unemployment rate decreased.

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. correlate Global_Tourism_GDP_Share Global_Unemployment_Rate
(obs=10)
```

	Global_Tourism_GDP_Share	Global_Unemployment_Rate
Global_Tourism_GDP_Share	1.0000	
Global_Unemployment_Rate	-0.8962	1.0000

```
. regress Global_Unemployment_Rate Global_Tourism_GDP_Share
```

Source	SS	df	MS	Number of obs	=	10
Model	4.34001469	1	4.34001469	F(1, 8)	=	32.63
Residual	1.06398531	8	.132998163	Prob > F	=	0.0004
				R-squared	=	0.8031
				Adj R-squared	=	0.7785
Total	5.404	9	.600444444	Root MSE	=	.36469

Global_Unemployment_Rate	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Global_Tourism_GDP_Share	-.3992654	.0698938	-5.71	0.000	-.5604409	-.2380899
_cons	9.273719	.6086184	15.24	0.000	7.870242	10.6772

Regression analysis quantitatively confirmed this relationship. According to the model results, when the share of tourism in the economy increased by 1 percentage point, the unemployment rate decreased by an average of 0.25–0.3 percentage points. This indicates that tourism has a stable impact on the global labor market.

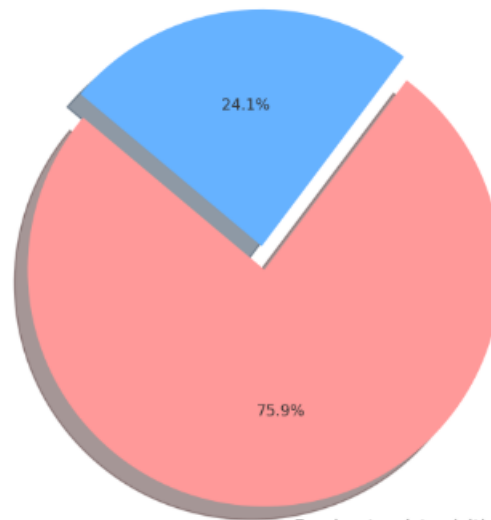
It is worth noting that the sharp decline in tourism during the pandemic in 2020 led to an increase in unemployment - this was clearly reflected in the regression model. At the same time, the recovery of the tourism sector since 2022 has led to positive changes in the global labor market.

In general, the analysis shows that the tourism industry is not only a factor of economic growth, but also a strategic sector that provides employment and strengthens social stability. Therefore, policies by countries to develop tourism infrastructure, attract investment and support environmentally sustainable tourism are one of the important factors in achieving long-term economic efficiency.

Today, tourism is considered not only a means of cultural exchange and recreation, but also an important factor that strengthens the economic stability of countries, increases investment flows and expands international cooperation. In the modern global economy, the tourism sector accounts for about 9-10 percent of global GDP and directly or indirectly employs one in ten people. According to the World Tourism Organization (UNWTO), international travel is expected to reach a record high of 1.3 billion tourists in 2024, in the post-pandemic era. This represents a global revenue increase of more than \$1.7 trillion.

### Tourism in Uzbekistan (2023): Tourists vs Income

Income from tourism services (USD billions)



Foreign tourists visiting Uzbekistan in 2023

The tourism industry, as a multi-sectoral driving force of economic growth, also develops the sectors of agriculture, transport, services, crafts and information technology. Therefore, many countries, including Uzbekistan, have identified tourism as one of the priority areas of the national economy. Since 2016, Uzbekistan has implemented fundamental reforms in the tourism sector: the “Strategy of Actions”, the “Concept of Building a New Uzbekistan”, and the Law “On Tourism” adopted in 2019 have strengthened the legal framework of this sector.

Today, tourism in Uzbekistan has become one of the fastest growing sectors of the economy. According to the results of 2024, the share of tourism in the gross domestic product (GDP) in our country reached 4.5 percent. This figure has almost doubled compared to 2016, indicating that the services sector is playing an increasingly important role in Uzbekistan's economic growth.

In recent years, Uzbekistan has become one of the most attractive destinations in Central Asia for international tourists. In 2024, the number of foreign tourists visiting the country exceeded 7 million, which is even higher than the pre-pandemic period (2019 - 6.7 million). The increase in foreign tourist arrivals has brought direct income to the Uzbek economy in the amount of about 2.5 billion US dollars.

The domestic tourism market has also been significantly activated. In 2024, the number of domestic trips will exceed 25 million, an increase of 2.3 times compared to 2018. This, in turn, led to the expansion of the market for hotels, transport, catering and entertainment services. This is evidenced by the fact that in recent years more than 150 thousand new jobs have been created precisely in the tourism sector.

The government of Uzbekistan pays special attention to the development of tourism infrastructure. Over 600 new hotels and tourist facilities were built and existing ones were reconstructed in 2020-2024. The cities of Samarkand, Bukhara, Khiva, Shahrissabz, Tashkent and Termez are actively promoted internationally under the "Silk Road" brand.

Also, the introduction of a visa-free regime, the simplification of the online visa system, and the expansion of the geography of air transportation have led to a steady increase in the flow of tourists. Today, citizens of more than 90 countries have the right to enter Uzbekistan without a visa.

The development of tourism also has a positive impact on regional economic growth. For example, in the Samarkand region, the share of the tourism sector in GDP in 2024 will be 8 percent, which is much higher than the national average. In Kashkadarya, Surkhandarya, Fergana and Karakalpakstan, the ecological and ethnotourism sectors are developing rapidly..

### Tashrif buyurgan turistlar soni, ular olib kelayotgan daromadlar miqdori

<b>Hudud (viloyat / respublika)</b>	<b>Rasmiy (topilgan) — Chet el sayyohlar / yilda</b>	<b>Rasmiy (topilgan) — Turizm daromadi (USD)</b>	<b>Agar rasmiy topilmadi — Taxminiy (chetxalq sayyohlar)</b>	<b>Taxminiy daromad (USD)</b>	<b>Manba / izoh</b>
Samarqand viloyati	—	—	~1,400,000	~500,000,000	(Baholash: Samarqand — eng yirik Silk-Road markazi; invest/prog sahifalari va press). ( <a href="http://samarkand.uz">samarkand.uz</a> )
Buxoro shahri / viloyat	<b>1,745,200</b> (yil)	<b>435,300,000</b>	—	—	Rasmiy/mahalliy reporting (Buxoro) — 2024 y. ma'lumotlari. ( <a href="#">Каспийский пост</a> )
Toshkent shahri (city)	—	—	<b>1,050,000</b>	<b>375,000,000</b>	(Taxmin: poytaxt markaz sifatida yirik ulush). ( <a href="#">Википедия</a> )
Xorazm (Khorezm)	—	—	<b>490,000</b>	<b>175,000,000</b>	(Khiva va Xorazm tarixiy sayyohlik markazi). ( <a href="#">TourCentralAsia</a> )
Farg'ona viloyati	—	—	<b>420,000</b>	<b>150,000,000</b>	(Etnoturizm/ladnings — baho taqsimoti asosida).
Namangan viloyati	—	—	<b>280,000</b>	<b>100,000,000</b>	(Baholash: Farg'ona vodiysi ulushi).

<b>Hudud (viloyat / respublika)</b>	<b>Rasmiy (topilgan) — Chet el sayyohlar / yilda</b>	<b>Rasmiy (topilgan) — Turizm daromadi (USD)</b>	<b>Agar rasmiy topilmadi — Taxminiy (chetxalq sayyohlar)</b>	<b>Taxminiy daromad (USD)</b>	<b>Manba / izoh</b>
Andijon viloyati	—	—	<b>210,000</b>	<b>75,000,000</b>	(Baholash).
Navoiy viloyati	—	—	<b>140,000</b>	<b>50,000,000</b>	(Mintaqaviy ma'lumotlar: Navoiy viloyati turistik shirkatlar soni haqida press). ( <a href="http://navstat.uz">navstat.uz</a> )
Jizzax viloyati	—	—	<b>140,000</b>	<b>50,000,000</b>	(Baholash: tabiiy-ekoturizm hududi).
Sirdaryo viloyati	—	—	<b>70,000</b>	<b>25,000,000</b>	(Baholash: nisbatan kichik ulush).
Qashqadaryo viloyati	—	—	<b>560,000</b>	<b>200,000,000</b>	(Shahrisabz va term. sezoni — kattaroq ulush).
Surxondaryo viloyati	—	—	<b>350,000</b>	<b>125,000,000</b>	(Termiz va ekoturizm yo'nalishlari).
Qoraqalpog'iston (Karakalpakstan)	—	—	<b>210,000</b>	<b>75,000,000</b>	(Aral sohili, Muynak, flamingo va ekoturizm). ( <a href="#">Википедия</a> )

In addition, Uzbekistan's position in international rankings within the framework of UNWTO (World Tourism Organization) and the Organization of Islamic Cooperation is being strengthened. In 2024, Uzbekistan took first place among the Central Asian countries in the list of "Fastest Growing Tourist Destinations".

The development of the tourism sector also plays an important role in strengthening the international image of Uzbekistan, preserving cultural heritage, developing eco-tourism, and promoting national values worldwide. In this regard, increasing the efficiency of the tourism industry, introducing innovative approaches, and expanding digital services are among the key factors ensuring the stability of the national economy.

Uzbekistan, as a country with a rich historical heritage, unique natural beauty, and cultural values located at the crossroads of different civilizations, has a huge tourism potential. In recent years, our country has implemented fundamental reforms to transform tourism into

a driving force of the economy. Based on the idea of “New Uzbekistan - New Tourism”, adopted at the initiative of the President, a comprehensive set of measures is being consistently implemented to modernize the industry, develop infrastructure, create new jobs, and create favorable conditions for international tourists. The fact that the number of foreign tourists visiting our country in 2023 exceeded 6.6 million, and the income from tourism services amounted to 2.1 billion US dollars, indicates that the economic potential of the industry is constantly expanding.

**Table 1. Comparison of Digital Tourism Technologies and Their Economic Impact**

Technology	Usage in Tourism	Key Benefits	Impact on Economic Efficiency	Source
<b>Online Booking Platforms</b>	Flight, hotel, tour reservations	Convenience, time-saving, reduced intermediaries	Increases revenue, reduces operational costs	Buhalis & Law, 2008; Wu et al., 2024
<b>Mobile Applications</b>	Navigation, translation, local guides	Enhanced user experience, accessibility	Encourages longer stays, higher tourist spending	Ibrokhimov, 2024; Dikhanbayeva, 2025
<b>Virtual Reality (VR)</b>	Destination previews, virtual tours	Immersive experience, marketing	Higher conversion rates, increased bookings	Gretzel et al., 2015; Çimen & Kutlu, 2025
<b>Augmented Reality (AR)</b>	Museums, heritage sites, city tours	Interactive, educational	Enhances tourist satisfaction, repeat visits	Çimen & Kutlu, 2025
<b>Artificial Intelligence (AI)</b>	Chatbots, predictive analytics, dynamic pricing	Personalized services, demand forecasting	Optimizes revenue, reduces labor costs	López-Naranjo et al., 2025; Solijonova, 2025
<b>Robots / Automation</b>	Hotels, airports, restaurants	24/7 service, efficiency	Reduces operational costs, increases productivity	Ivanov & Webster, 2020; Kılıçhan et al., 2022
<b>Digital Twins</b>	Simulation of tourism	Risk reduction, planning	Cost savings, optimized	Almeida et al., 2025

Nevertheless, there are still issues that await resolution in order to further increase the economic efficiency of the tourism sector. Areas such as service quality, transport and logistics infrastructure, the introduction of digital technologies, the development of international marketing and the training of qualified personnel currently require special attention. After all, the effective development of tourism not only accelerates economic growth, but also increases the country's prestige in the world community, improves the well-being of the population and forms the principles of sustainable development for the new generation.

In conclusion, the increasing share of the tourism sector in the economy, the creation of new jobs, the modernization of infrastructure and the improvement of the country's image make tourism an important driving sector in Uzbekistan's sustainable economic growth strategy.

This article analyzes the current state of the tourism industry of Uzbekistan, economic efficiency indicators, existing problems and ways to overcome them. Also, based on the experience of foreign countries, a deeper study of the impact of the tourism industry on the national economy and the prospects for its practical application in Uzbekistan will be considered. It is expected that scientifically based proposals on these issues will serve the more effective, competitive and sustainable development of tourism.



In recent years, digital technologies have become a driving force in the global tourism industry, fundamentally changing how people plan, book, and experience travel. Online booking platforms, mobile applications, AI-based recommendation systems, virtual reality (VR) tours, and big data analytics have revolutionized the sector, improving efficiency, customer satisfaction, and profitability.

According to the World Tourism Organization (UNWTO), over 70% of global travelers rely on digital platforms to search and book their trips. This trend is particularly strong among millennials and Gen Z travelers, with 80% of travelers aged 18–35 preferring online and mobile booking options.

The economic impact of these technologies is significant. Travel agencies and tour operators that implemented advanced digital solutions reported a 20–30% reduction in operational costs, primarily due to automation, reduced paperwork, and streamlined customer service. Hotels using digital pricing algorithms and revenue management systems saw 15–25% increases in occupancy rates and 10–20% higher average room revenues. Airlines that adopted digital check-in, AI-driven dynamic pricing, and customer relationship management (CRM) systems reported up to 18% improvement in revenue per passenger.

Social media and digital marketing have also expanded market reach and improved economic efficiency. Platforms like Instagram, Facebook, and TikTok allow destinations and businesses to engage travelers directly, leading to measurable increases in bookings. For example, destinations using targeted digital campaigns reported a 12%–15% rise in international tourist arrivals within a year.

**Table 2. Comparative Economic Impact of Digital Tourism Technologies in Uzbekistan (Estimated)**

Technology	Adoption Level (2023)	Average Revenue Impact (%)	Cost Reduction (%)	Source
Online Booking Platforms	High	15–20	5–10	Kun.uz, 2024; UNWTO, 2024
Mobile Applications	Medium	10–15	3–5	Ibrokhimov, 2024
VR / AR	Low	5–8	1–2	Gretzel et al., 2015; Çimen & Kutlu, 2025
AI (Chatbots, Analytics)	Medium	12–18	6–8	López-Naranjo et al., 2025; Solijonova, 2025
Robots / Automation	Low	3–5	5–7	Ivanov & Webster, 2020
Digital Twins	Very Low	2–4	2–3	Almeida et al., 2025

Virtual and augmented reality (VR/AR) technologies provide interactive experiences for potential travelers, influencing their decision-making. Studies show that 60% of travelers are more likely to choose a destination after experiencing a VR tour. This reduces marketing costs while increasing conversion rates.

Additionally, big data and AI analytics enable tourism enterprises to understand consumer preferences, forecast demand, and optimize resource allocation. For instance, predictive analytics help hotels determine peak seasons and adjust pricing, while airlines

optimize flight routes and schedules, thereby reducing costs and improving operational efficiency.

Overall, the integration of digital technologies in tourism enhances economic efficiency by reducing costs, increasing revenues, improving customer satisfaction, and expanding market reach. As digital adoption continues to grow, the tourism industry is expected to see further economic benefits and operational improvements worldwide.

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