



ELIT

Economic Laboratory Transition
Research Podgorica

Montenegrin Journal of Economics

For citation:

Rsaldin, Y., Tleubayeva, A., Trusheva, S. (2026), "International Experience in the Development of Digital Tourism and Its Influence on Kazakhstan", *Montenegrin Journal of Economics*, Vol. 22, No. 2, pp. 169-187.

International Experience in the Development of Digital Tourism and Its Influence on Kazakhstan

YERLAN RSALDIN¹, AITOLKYN TLEUBAYEVA² and SHARAFAT TRUSHEVA³
(Corresponding author)

¹PhD student, L.N. Gumilyov Eurasian National University, Astana, Kazakhstan, email: rsldnrln@gmail.com, ORCID ID: <https://orcid.org/0009-0004-6496-2353>

²PhD, Associate Professor L.N. Gumilyov Eurasian National University, Astana, Kazakhstan, email: aitolkyn.t@mail.ru, ORCID ID: <https://orcid.org/0000-0002-5749-4289>

³PhD, Associate Professor Toraighyrov University, Pavlodar, Kazakhstan email: sharafat.trusheva.80@mail.ru, ORCID ID: <https://orcid.org/0009-0007-7594-032X>

ARTICLE INFO

Received February 18, 2025
Revised from March 18, 2025
Accepted April 18, 2025
Available online April 15, 2026

JEL classification: L83, Z32, O33, O31

DOI: 10.14254/1800-5845/2026.22-2.14

Keywords:

Digital tourism,
digital transformation,
competitiveness,
digital technologies,
sustainable development,
tourism community.

ABSTRACT

The need for qualitative improvements in the process of tourist service delivery in the context of digital transformation drives the relevance of this study. The effective use of digital technologies, which enable the automation, acceleration, and modernization of these processes, will positively impact the development of tourism in the country. This research aims to identify how the efficient use of digital technologies can influence the country's tourism development level, including its competitiveness and economic contribution. Given global trends in tourism, which are increasingly based on digitalization and the adoption of new technologies, this study is particularly relevant, as it allows the country to keep pace with global standards and the expectations of tourists. The analysis of digital tourism development, with the implementation of international best practices in the Republic of Kazakhstan, is not only timely but also strategically significant for maintaining and enhancing the country's status within the global tourism community. The objective of this study is to analyze the current state and development trends of digital tourism to identify key factors influencing the competitiveness of the tourism industry. Additionally, it aims to develop recommendations for optimizing the use of digital technologies to stimulate economic growth and enhance the tourist experience. Research Hypothesis: digital technologies in Kazakhstan's tourism sector are a key factor in enhancing the country's competitiveness in the global tourism market, meeting the needs of modern tourists, and driving economic growth. The more the state invests in innovative financing, the greater the development of digital tourism will be. Research Results: the author examined the relationship between digital tourism and the system of indicators reflecting the inclusivity of technological development in Kazakhstan's tourism industry. An extrapolation forecast of the indicator "Enterprises with Innovations" for 2023–2024 was conducted, demonstrating the innovative activity of enterprises in the tourism industry. This analysis highlights the trend that innovative financing in tourism can have a significant impact on the development of digital tourism by providing resources for the implementation of new digital technologies and supporting innovative projects.

INTRODUCTION

The increasing demand for online services for booking hotels, flights, excursions, and other travel-related services continues to rise. The development of digital tourism in Kazakhstan, as in other countries, is closely linked to the adoption of new technologies and the evolving needs of modern tourists. The study of digital tourism development is highly relevant for several reasons:

- In the context of global digitalization, tourists increasingly prefer using online platforms for planning and booking their trips. The advancement of digital technologies in tourism is crucial for attracting modern travelers and ensuring their convenience.
- Tourism is a vital sector of the economy, contributing to GDP growth, job creation, and infrastructure development. Digital innovations can enhance the efficiency of the tourism industry, which is essential for the country's economic progress.
- Countries actively implementing digital technologies in tourism become more competitive in the global market. This includes not only the development of online platforms but also the use of data analytics, virtual technologies, artificial intelligence, and other innovations.
- Modern tourists expect convenience and easy access to information in digital formats. Analyzing the development of digital tourism will help assess how well the country meets the expectations and requirements of digital consumers.
- Digital technologies can be leveraged to ensure tourist safety and effectively manage visitor flows, which is particularly important in the post-pandemic world.
- Research on digital tourism will identify current trends and innovations in the industry, providing valuable insights for developing strategies and attracting investors.
- Analyzing digital tourism development can serve as an important tool for shaping government policies in tourism, including initiatives aimed at supporting innovation and digital transformation.

Overall, this study will not only provide an overview of the current state of digital tourism in Kazakhstan but will also serve as a foundation for developing strategies for the further growth of this key economic sector.

1. LITERATURE REVIEW

Tourism, as an important component of economic growth and recovery, has a significant impact on various aspects of public and economic activity. Recent studies, such as the work of T. Dogru and U. Bulut (2018), emphasize that tourism resources play a key role in successfully attracting tourists and investors. The availability of attractive locations and facilities can contribute to an increase in tourist flow, which, in turn, benefits economic development (Li et al., 2019). In her research, E. Shumakova (2019, p. 400) focusing on the peculiarities of innovations in the hotel industry, primarily emphasizes organizational and managerial innovations and the development of innovative hotel infrastructure.

The issues of innovative development in the hotel industry have been given considerable attention by scholars such as: A. Abozhina (2017), J. Hao & Y. Liu (2013), R. Musavengane (2019), M. Myratdurdiev & Y. Doroshenko (2017), A. Tanina et al. (2020). The development of digital platforms has increased the diversity and quantity of tourism products, services and experiences, accelerating the pace of economic transactions, market awareness and feedback. These transformations have enabled all sectors of the tourism industry to better meet consumer demand, while promoting the development of new markets, opening up new opportunities for the long-term development of the tourism industry (Dredge et al., 2019).

Existing studies have proven the feasibility of using modern technologies in the exploration, extraction, monitoring and protection of tourism resources, and the application of remote sensing, GIS, databases and other technologies can provide a strong impetus for the prosperity of tourism (Ying, et al., 2024).

An important aspect of the relationship between tourism and digital technologies is the effective management of financial resources in the tourism industry. Studies conducted by W. Chen et al. (2023) and J. Tian et al. (2021) emphasize that optimal distribution and smart allocation of financial resources contribute to more efficient use of social resources. Proper financial management in the tourism industry can lead to increased revenue and improved quality of tourist services. The effectiveness of utilizing innovative

potential, according to A. Kulmagambetova et al. (2019, p. 57) is determined not only by the level of scientific research and development but also by a combination of corresponding technical, production, organizational, marketing, and financial operations included in innovation processes.

In light of the digital transformation of tourism, these financial management principles can also be directed toward the implementation of digital innovations. Investments in digital technologies, such as virtual tours, mobile applications, online booking, and other digital services, can not only increase the attractiveness of tourism resources but also optimize business processes, ultimately contributing to the overall development of the tourism industry. Digital tourism can complement and enrich various types of tourism, providing tourists with convenient and interesting options for interaction with different aspects of travel in Kazakhstan and influencing various types of tourism (Table 1).

Table 1. Types of Tourism in Kazakhstan According to the Tourism Sector Product Matrix

	Health and Wellness Tourism	Business Tourism	Sports Tourism	Religious Tourism	Educational Tourism	Social tourism	Cultural-Cognitive Tourism	Adventure Tourism	Congress Tourism	Eco tourism
MICE-tourism										
Beach tourism										
Short-term recreation										
Mountain and Lake Recreation										
Adventure recreation										
Cultural tourism										

Source: Compiled by the author

Digital tourism influences various types of tourism in the following ways:

- Cultural Tourism – Digital technologies can offer virtual tours of cultural and historical sites, attracting those interested in cultural landmarks.
- Nature Tourism – Mobile applications and digital guides can provide information on natural attractions, hiking routes, ecological factors, etc.
- Extreme Tourism – Digital platforms can offer information on locations for extreme recreation, as well as simplify booking processes.
- Business Tourism – In the business tourism sector, digital technologies can facilitate virtual conferences, webinars, and other business events.
- Medical Tourism – In the field of medical tourism, digital platforms can enable online consultations and advance bookings for doctor appointments.
- Gastronomic Tourism – Digital platforms can provide information on restaurants offering local cuisine, as well as reviews and ratings.

The article by Gretzel, et al. (2015) provides the foundation and development of the concept of "smart tourism," discussing how information and communication technologies transform the tourism industry. In the work of D. Buhalis & A. Amaranggana, A. (2015), the authors explore how "smart" tourist destinations can enhance the traveler experience through service personalization using digital technologies. Y. Li et al. (2017) present the concept of "smart tourism" in the context of tourist information services, discussing its components and impact on the industry. C. Koo, et al. (2015) propose a conceptual model of the competitiveness of "smart" tourist destinations, emphasizing the role of technologies in enhancing the attractiveness of destinations. The article by U. Gretzel et al. (2015) examines the conceptual foundations for understanding the ecosystems of "smart tourism," including the interaction between various stakeholders and technologies.

These works collectively provide valuable insights into how digital and smart technologies are reshaping tourism, from enhancing experiences to improving destination competitiveness. Would you like help analyzing or summarizing any of these studies in more detail? Based on the study of literature sources on the implementation of international experience in Kazakhstan, the problems of digital tourism development have been identified (Table 2).

Table 2. Problems of Implementing International Experience in the Development of Digital Tourism in Kazakhstan

<i>Nº</i>	<i>Problem</i>	<i>Justification</i>	<i>Result</i>
1	Inadequate digital infrastructure	In Kazakhstan, especially in rural and remote regions, there is a lack of necessary digital infrastructure, such as high-speed internet.	This significantly limits the opportunities for the development of digital tourism.
2	The low level of digital literacy	Many representatives of the tourism industry and service users are insufficiently prepared to use modern technologies.	This reduces their ability to effectively use digital platforms and tools.
3	Data fragmentation	The lack of a unified platform for managing tourism information and coordinating between stakeholders.	It hinders the creation of integrated digital solutions.
4	Limited funding	Investments in tourism digitalization are insufficient, which hinders the implementation of innovative technologies and the adaptation of best international practices.	
5	Legal and regulatory barriers	The legal framework for digitalization of tourism in Kazakhstan needs modernization.	Incomplete regulation of the use of big data, artificial intelligence, and digital platforms limits the potential of the industry.

Source: compiled by the author

Therefore, a comprehensive approach is required, combining infrastructure development, staff training, modernization of the legislative framework, and attracting investments. Given the unique geographical and cultural characteristics of the country, the digitalization of tourism can become a key driver of economic growth and international attractiveness for Kazakhstan as a tourist destination.

2. RESEARCH METHODS

To construct the trend model, the least squares method (LSM) was used, which minimizes the deviations between the original data and the theoretical function. Based on the developed model, point and interval forecasts of the number of enterprises with innovations in the tourism sector were made, considering confidence intervals to assess potential fluctuations. To identify the key factors influencing the dynamics of the number of enterprises with innovations, the principal component analysis (PCA) method was applied. This method helped reduce the data's dimensionality without losing significant information and allowed for the identification of key trends. The data were visualized to:

- Identify trends, seasonal and cyclical fluctuations;
- Check the adequacy of the model by comparing calculated and actual values;
- Present forecast values as point and interval graphs.

The comprehensive application of these methods allowed for an in-depth study of the dynamics of enterprises with innovations, identification of significant patterns, and the development of a reliable forecasting model. It also ensured a high-quality analysis and interpretation of the results, necessary for making strategic decisions.

3. MAIN PART

The business world is constantly changing under the influence of technologies, trends, and global events. In this sense, the digital sphere is one of the most dynamic and key trends, with marketing playing an increasingly central role and becoming more deeply integrated into the business structure, including the tourism industry. Tourism companies, operating within the current economic and political system, are under intense pressure due to fierce competition to maintain and improve their market position. In such conditions, only companies with high competitiveness can remain stable and have the opportunity to

grow—competitiveness being an integral characteristic that includes both financial and non-financial indicators, such as new technologies, innovative business methods, etc.

According to a survey by Euromonitor International, *Voice of the Industry: Travel Survey* conducted in 2022, the immediate business priorities for companies are focused on brand development and finding new growth areas, whether through new sales channels, mergers and acquisitions, or innovations. These were indicated by 53% and 44% of respondents, respectively. Investing in new technologies was chosen by 33% of respondents in 2022, compared to 38% in 2021. This decrease is likely due to the fact that during the pandemic, companies already invested significantly in the development of online channels, accelerating the digitalization of the industry by several years. Now, the focus has shifted more towards the consumer and the quality of the product. Globally, the share of online bookings has increased from 59% in 2019 to 65% in 2022. The stress that the tourism sector faced has led many companies to adopt various consumer-oriented innovative and digital solutions, as well as multi-channel strategies for interacting with customers (Figure 1).

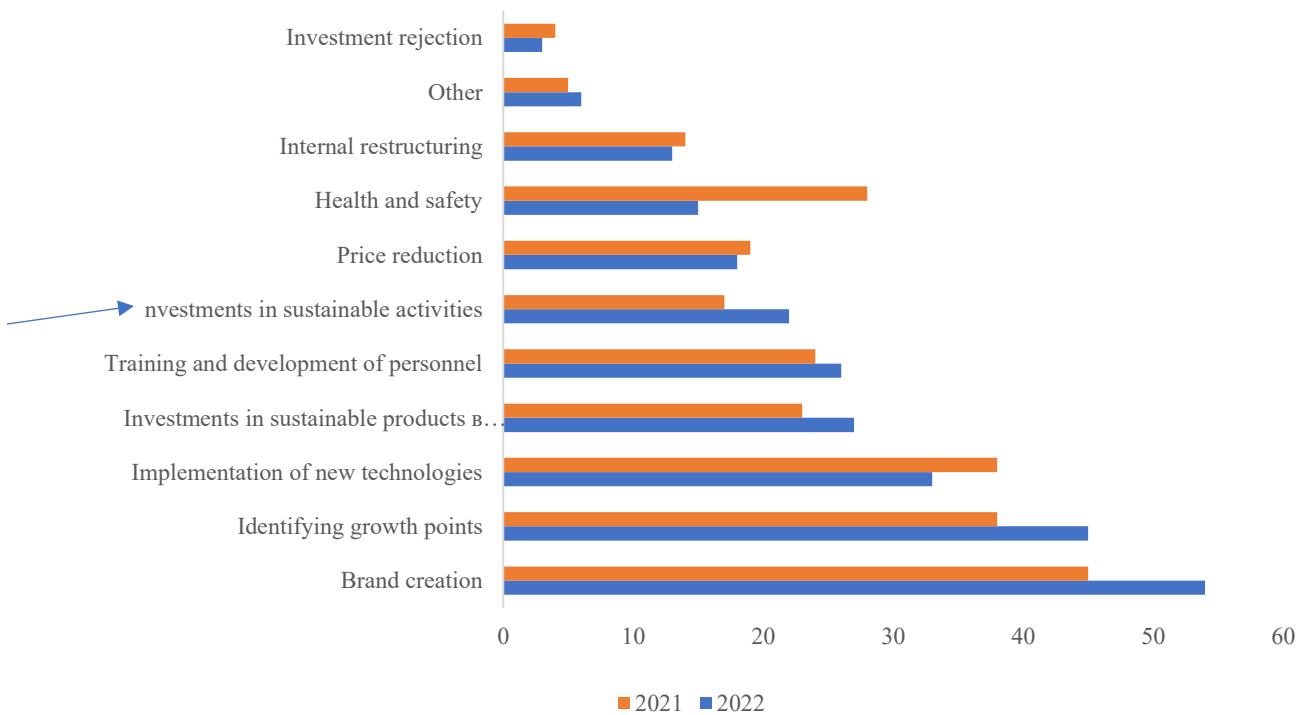


Figure 1. Business Goals of Tourism Companies in 2021-2022
 Source: Compiled based on the source: <https://tourisonline.kz/>

In the modern tourism industry, companies are striving to master a variety of innovative and digital solutions, as well as implement multi-channel strategies for interacting with consumers. The main areas of development in this field are illustrated in Figure 2.

The use of innovative and digital solutions helps tourism companies not only attract new clients but also improve the satisfaction and loyalty of existing ones. When choosing between priorities for the next 3-5 years, 58% of respondents indicate the need to improve the customer experience, while 48% highlight the implementation of new technologies in 2022, compared to 53% and 52%, respectively, in 2021. Furthermore, the interest in creating loyalty holds significantly less weight compared to flexibility and personalization, as consumers increasingly expect tourism companies to understand and meet their individual needs at the right time. Additionally, 38% of respondents consider investments in sustainable products and services as one of the main priorities for the next 3-5 years (Figure 2).

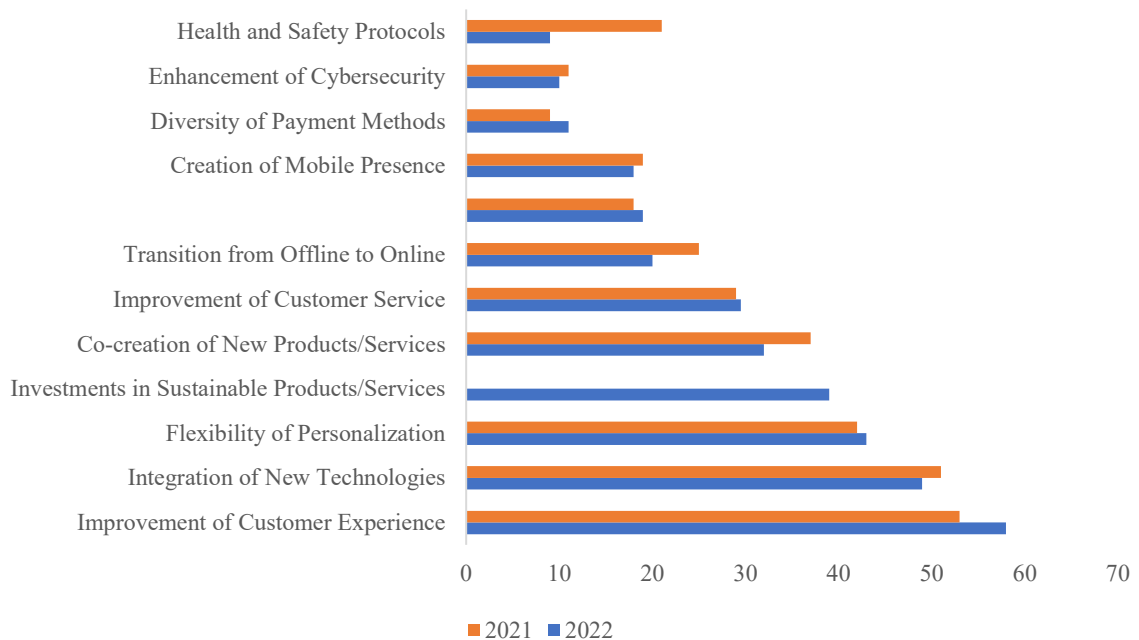


Figure 2. Business Goals of Tourism Companies for the Next 3-5 Years
 Source: compiled by the authors according to <https://tourisonline.kz/>

Consumers are showing increasing engagement in sustainable travel, and companies are adopting a comprehensive approach to developing their activities in line with sustainable development goals. They aim to meet the changing expectations and preferences of consumers. Let's explore some key aspects:

A. Sustainability and Environmental Responsibility:

- Developing strategies aimed at reducing the environmental impact is becoming an integral part of companies' operations, especially in the aviation industry.
- The use of more eco-efficient fuels and innovative concepts such as electric aviation demonstrates a commitment to reducing the carbon footprint.

B. Innovative Payment and Subscription Models:

- The introduction of new payment models like "Buy Now, Pay Later" allows customers to manage their finances more flexibly, especially when planning trips.
- Subscription models offered by airlines provide convenience and predictability for customers, allowing them to use services at a fixed cost.

C. Personalized Experience and Dynamic Travel:

- The development of personalized options is crucial for attracting and retaining customers. Companies strive to offer unique and tailored services that meet the individual needs of each customer.
- On-demand service ordering options enhance the travel experience, giving customers the ability to choose and control their journey.

D. E-wallets and Convenient Financial Tools:

- The implementation of internal e-wallets and innovative financial tools reflects the effort to ensure the convenience and security of financial transactions for clients in the tourism industry.

E. Contingency Solutions for Potential Problems:

- Given the current pandemic situation, providing Covid-19 insurance has become an important element of reassurance for travelers.

These innovations emphasize companies' efforts to meet the growing expectations of modern consumers, who are increasingly focused on convenience, personalization, and sustainability when planning their travels. The main technologies companies plan to invest in over the next five years are big data and analytics and artificial intelligence, selected by 66% and 49% of respondents, respectively (Figure 3).

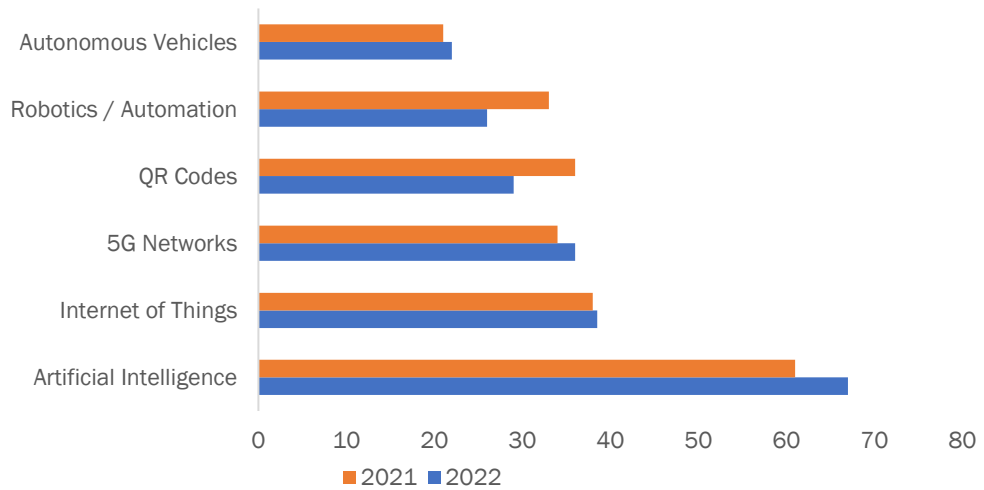


Figure 4. Technologies Influencing the Tourism Business in the Next 5 Years
Source: compiled by the authors according to <https://tourisonline.kz/>

Moreover, cloud solutions play an important role in enhancing customer experience and personalization. Meanwhile, the long-term importance of artificial intelligence, 5G networks, geospatial data, and QR codes has decreased. This is likely due to the fact that these technologies have already reached their critical mass and are no longer seen as innovative. These trends reflect the evolving priorities of companies in the context of technological transformation. Let's consider some aspects related to investments in various technologies (Table 3).

Table 3. Technological transformation of travel companies

No	Technologies (Innovations)	Features
1	Big Data and Analytics	Investments in Big Data and analytics remain a priority, as these technologies enable companies to process and analyze large volumes of data to make more informed strategic decisions.
		Data analytics is highly significant for the tourism industry, allowing companies to better understand customer preferences and optimize their services.
2	Artificial Intelligence (AI)	AI continues to be a focal point as companies seek ways to automate processes, enhance personalization, and create more intelligent systems.
		In the tourism industry, AI can be applied to provide personalized recommendations, manage bookings, and predict customer needs.
3	Cloud Solutions	Cloud technologies remain a crucial factor for ensuring flexibility, scalability, and accessibility of data and applications.
		In the tourism industry, cloud solutions allow companies to manage bookings, analyze data, and provide real-time access to information.
4	5G Networks	While interest in 5G may decrease over the next five years, this technology will remain a key element for providing high-speed and stable internet in the future.
		5G can play a crucial role in enhancing the quality of connectivity and improving the travel experience, including the use of virtual and augmented reality.
5	Geospatial Data and QR Codes	The reduced interest in geospatial data and QR codes may be due to the fact that these technologies are already widely used and have become standard practices.
		They will continue to be important for providing accurate location-based information and facilitating interaction with services.

Source: Compiled by the author

These technological directions are balanced and combined to ensure a comprehensive approach to enhancing customer experience and optimizing operations in the tourism industry. AI plays a significant role in the transformation of the tourism industry, providing an improved and innovative experience for travelers (Figure 4).

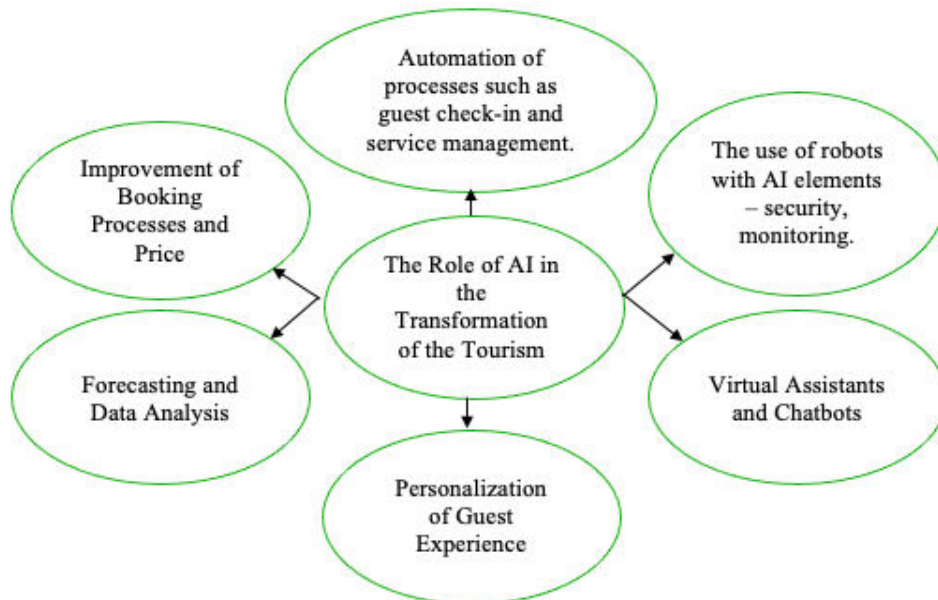


Figure 4. The Role of AI in the Transformation of the Tourism Industry
Source: Compiled by the author.

The use of artificial intelligence in tourism improves business process efficiency, enriches the customer experience, and contributes to a more innovative and competitive industry landscape. For example, the CityPass Kazakhstan project is an equivalent of the globally recognized tourist card practice, launched in Kazakhstan in 2017. This tourist card is currently operating successfully in the cities of Astana, Almaty, and Burabay, with a joint card for tourists in the cities of Turkestan and Shymkent, called the Silk Way Pass, planned for launch this year. CityPass provides free access to all attractions, museums, and tours included in the program, and the validity of the online card begins upon activation at the first visited location.

Personalization and a consumer focus can become an important solution for creating niche products and services for different groups of travelers. For instance, the Wheel the World booking platform is designed for people with disabilities. By collaborating with partners, the company offers accommodation services, tours, and events that meet the unique needs of consumers through personalized service.

Although the tourism and travel industry is expected to reach pre-pandemic levels no earlier than 2024, it is essential to shift from a quantity-driven model to a quality-driven one. Today, companies have access to digital tools that not only help create new products and build emotional connections with consumers but also achieve climate and sustainability goals.

Due to its geopolitically favorable location, natural recreational resources, and world-class cultural and historical heritage, Kazakhstan has the potential to develop new tourist products and can become one of the main players on the global tourist map, as it meets all the necessary basic conditions. As a result, new businesses are opening in the restaurant, sports, cultural, souvenir, and retail sectors.

The development of the tourism industry and related infrastructure is identified as a key direction within the framework of the State Program for the Development of the Tourism Industry of the Republic of Kazakhstan for 2019-2025. However, the tourism sector in Kazakhstan remains a weak link in the overall development of the country despite various attempts to improve it.

Meanwhile, according to the report on the results of monitoring the implementation of budget programs (subprograms) of the Ministry of Culture and Sports of the Republic of Kazakhstan, the volume of

services provided by accommodation establishments in the regions has shown an increasing trend (Figure 5). In the regional context of tourism development and the corresponding volume of services provided, the following regions stand out:

- Almaty: 25,710,759.7 thousand KZT
- Astana: 22,829,527.6 thousand KZT
- Aktobe Region: 12,843,773.9 thousand KZT
- East Kazakhstan Region: 5,889,224.5 thousand KZT
- Atyrau Region: 5,371,264.6 thousand KZT

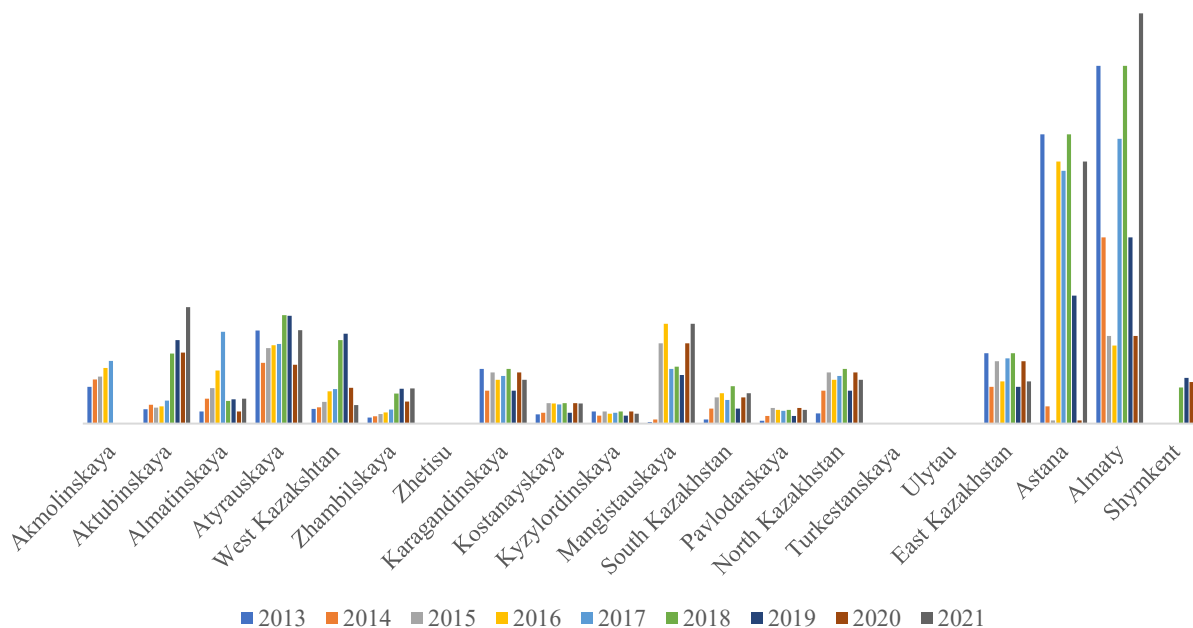


Figure 5. Volume of services provided by accommodation establishments across regions of the Republic of Kazakhstan, in thousand tenge

Source: Compiled based on data from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan for 2013-2021. [Electronic resource] URL: <https://www.stat.gov.kz>

In the context of digital tourism development, these regions—Almaty, Astana, Aktobe Region, East Kazakhstan Region, and Atyrau Region—offer certain prospects and opportunities (Table 4).

Table 4. Prospects and Opportunities for the Development of Digital Tourism

Region	Volume of services provided, thousand tenge	Prospects and Opportunities
Almaty	25710759,7	- Development of digital platforms for virtual tours of historical and natural landmarks in the region
		-Implementation of mobile applications with geolocation for the convenient movement of tourists around the city
Astana	22829527,6	-Creation of digital information platforms for hosting virtual conferences and business events
		- Development of mobile applications for tourists with interactive maps and recommendations for gastronomic and cultural tourism
Aktubinskaya	12 843773,9	- Use of digital platforms for promoting eco and nature tourism in the region
		- Development of online platforms for booking tours and services within regional nature reserves
East Kazakhstan region	5889224,5	- Implementation of virtual reality technologies to create interactive tours of historical sites and natural corners of the region
		- Development of online platforms for booking various types of tourist services

Atyrauskaya	5 371 264,6	- Implementation of digital systems for managing tourism infrastructure to optimize the services provided
		- Creation of mobile applications providing information about local cultural events and gastronomic offerings

Source: Compiled by the author based on the source

The combination of these initiatives and innovations in the sphere of digital tourism across these regions can stimulate tourist interest by providing a more convenient and interactive experience while fostering the sustainable development of Kazakhstan's tourism industry. Kazakhstan possesses significant tourism potential; however, no single region is currently capable of becoming a fully attractive and accessible tourist destination that enjoys high popularity among international tourists. Therefore, a concentrated effort to enhance the national strategic management system in the tourism sector is necessary, considering modern innovative solutions in digital tourism. Digital technologies in tourism should be developed and utilized in a way that ensures equal access and meets the needs of diverse tourist audiences, thereby contributing to the inclusive development of the industry in Kazakhstan. The author analyzed the relationship between digital tourism and the system of inclusivity indicators for the technological development of the tourism industry in the Republic of Kazakhstan (Table 5 - URL:/https://www.stat.gov.k).

Inclusivity of technological indicators refers to how accessible and applicable these technologies are to various population groups, including people with disabilities, individuals from different social strata, and more. Digital technologies in tourism can promote inclusivity by providing access to information, services, and travel opportunities for all categories of tourists. The ease of using online platforms and mobile applications supports the inclusion of groups that might face challenges when using traditional booking methods. Digital technologies in tourism can make travel information more accessible and simplify the processes of booking and interacting with services for diverse categories of tourists. In the context of digital tourism, the opportunities provided by Kazakhstan's recreational zones and historical and cultural heritage can be effectively leveraged to promote digital tourism and strengthen domestic tourism within the country:

- Digital virtual tours
- Digital guides and applications
- Interactive online events
- Online booking platforms
- Social media and marketing
- Educational resources

All these measures can create an innovative digital environment that enhances Kazakhstan's attractiveness as a tourist destination, thereby ensuring sustainable growth in domestic tourism and stimulating the development of related sectors of the economy.

Table 5. System of indicators for the inclusivity of technological development in the tourism industry of the Republic of Kazakhstan

Indicator	01.2014	01.2015	01.2016	01.2017	01.2018	01.2019	01.2020	01.2021	01.2022	01.2023
Hotel occupancy rate per bed, %.	27,35	23,13	22,80	22,70	25,00	23,20	23,70	17,3	22	24,5
Number of rooms in accommodation facilities, units	41197,00	49128,00	53126,00	60427,00	65791,00	71858,00	75913,00	77131	79820	84416
Level of innovative activity of enterprises across all types of innovations, %.	8,0	8,1	8,1	9,3	9,6	10,6	11,3	11,5	10,5	12,0
Number of visitors served by accommodation facilities for inbound tourism (non-residents), persons.	586 038	679 018	692 213	722 515	891 911	830 922	979 781	252 726	329 754	609 803
Volume of services provided by accommodation facilities, thousand tenge.	59714164,2	72401941,1	72597228,3	82853434,6	108359760,4	103948256,9	120527162,1	66860328,5	109027262,7	129183176,7
Indicators of ICT usage, %.	6,7	7,1	11,5	4,4	1,5	1,6	5,4	7,4	8,5	9,3
Accommodation and catering services, million tenge.	36 218	49 373	48 336	80 780	129 496	192 132	148 385	143 236	173 730	182325
Arts, entertainment, and recreation, million tenge	97 796	113 523	113 630	68 779	75 132	104 210	155 896	351 043	264 499	364000

1. Average Value (Mean):

- The mean is calculated as the sum of all observations divided by the number of observations:

$$\text{Mean} = \frac{\sum_{i=1}^n x_i}{n}$$

where:

x_i – represents each individual observation;
 n - is the total number of observations..

For the indicator hotel occupancy (bed capacity utilization) (%):

$$\text{Mean} = \frac{27,35+23,13+22,80+22,70+25,00+23,20+23,70+17,30+22,00+24,50}{10} = 23,168.$$

2. Standard deviation (StdDev):

- The standard deviation shows how much values deviate from the mean:

$$\text{StdDev} = \sqrt{\frac{\sum_{i=1}^n (x_i - \text{Mean})^2}{n}}$$

where:

x_i – indicator value;
 Mean – mean value
 n – number of observations.

$$\text{StdDev} = \frac{(27,35-23,168)^2+(23,13-23,168)^2+\dots+(24,50-23,168)^2}{10} =$$

3. Minimal value (Min):

- The minimum value is defined as the smallest of all values in the dataset:

$$\text{Min} = \min (x_1, x_2, \dots, x_n)$$

$$\text{Max} = \max (x_1, x_2, \dots, x_n)$$

$$\text{Min} = 17.3, \text{Max} = 27,35$$

4. The calculations for all indicators are as follows (Table 6):

$$\text{Mean} = \frac{41197+49128+53126+\dots+84416}{10}$$

$$\text{StdDev} = \sqrt{\frac{\sum_{i=1}^{10} (x_i - \text{Mean})^2}{10}}$$

$$\text{Min} = 41197, \text{Max} = 84416$$

Table 6. Calculations for all indicators

<i>Indicator</i>	<i>Mean</i>	<i>StdDev</i>	<i>Min</i>	<i>Max</i>
Hotel occupancy rate (beds) , %	23,168	2,56162188 2063523	17,3	27,35
Number of rooms in accommodation facilities, units	65880,7	14465,1961 7756895	41197,0	84416,0
Level of innovation activity of enterprises across all types of innovations , %	9,9	1,50259035 59446192	8,0	12,0
Number of visitors served by accommodation establishments for inbound tourism (non-residents), persons	657468,1	229352,944 7895875	252726,0	979781,0
Volume of services provided by accommodation establishments, thousand tenge	92547271,55	24522806,2 1330199	59714164, 2	129183176, 7

ICT usage indicators , %	6,3400000000 0001	3,20458005 5691124	1,5	11,5
Accommodation and food services, million tenge	118401,1	59690,0392 0523274	36218,0	192132,0
arts, entertainment, and recreation, million tenge	170850,8	112885,837 84297796	68779,0	364000,0
Note -				

Source. Compiled based on the calculations made

The application of innovative methods in the tourism industry is a key factor for its sustainable development and competitiveness. Innovations in the tourism industry not only enrich the experience of tourists but also contribute to the sustainable and long-term development of the sector as a whole. The implementation of modern technologies and creative approaches helps the industry remain relevant and attractive to contemporary consumers. In the context of globalization and the digitalization of the economy, the government focuses on creating incentives for innovation in supporting SMEs. In this regard, the author conducted an analysis of the indicator for enterprises that have innovations (Figure 6).

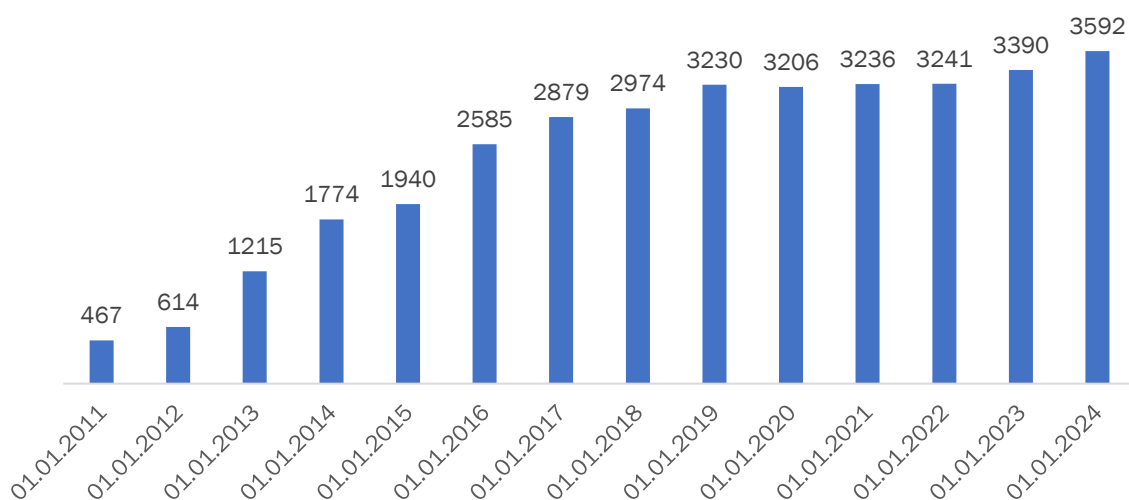


Figure 6. Dynamics of enterprises with innovations, units

Source: Compiled by the author based on the source: Electronic resource: Data from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan //www.stat.gov.kz

Initially, using the Irwin criterion, it was verified that the original time series did not contain anomalous observations (Table 7- <https://www.pwc.com/kz>).

Table 7. Checking for the presence of anomalous observations in the time series of enterprises with innovations

№	Year	Observed value of the Irwin criterion
1	01.01.2011	
2	01.01.2012	0,1402
3	01.01.2013	0,5732
4	01.01.2014	0,5331
5	01.01.2015	0,1583
6	01.01.2016	0,6151
7	01.01.2017	0,2804
8	01.01.2018	0,0906
9	01.01.2019	0,2442
10	01.01.2020	0,0229
11	01.01.2021	0,0286

12	01.01.2022	0,0047
13	01.01.2023	0,1404
14	01.01.2024	0,1903

Source: Compiled by the author based on the calculations made

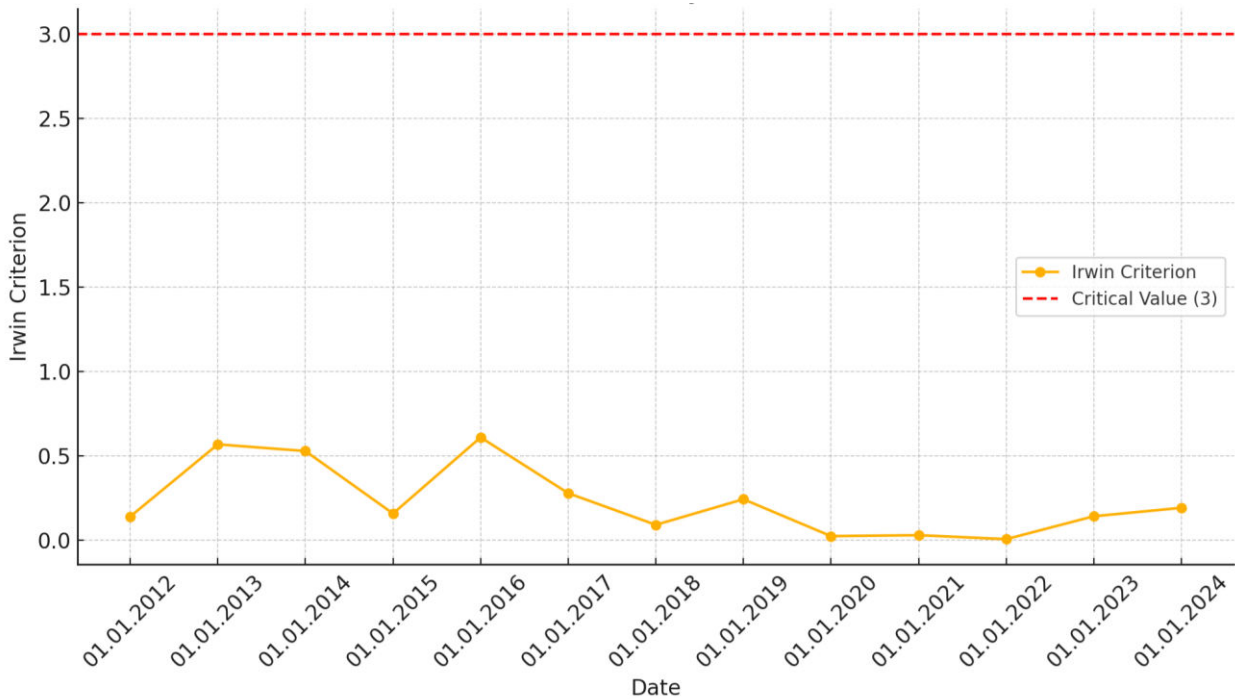


Figure 7. Irwin Criterion Analysis Over Time

Source: compiled by the authors

The graph demonstrates the changes in the observed values of the Irwin criterion over time. The red dashed line represents the critical value (3), above which points may be identified as anomalies. The observed value of the Irwin criterion is calculated using the formula:

$$\lambda_t = \frac{|y_t - y_{t-1}|}{\sigma_y}, \quad t = \overline{2, 15} \quad (1)$$

Critical value of the Irwin criterion $\lambda_t < 3$ (All observed values of the Irwin criterion are below the critical value), indicating the absence of anomalous observations. Using the criterion of 'ascending' and 'descending' series, it was found that the series has a trend component:

- General form of the 'ascending' and 'descending' series criterion (to identify a trend, it is sufficient to violate at least one inequality):

$$v(n) > \left[\frac{2n-1}{3} - 1,96 \sqrt{\frac{16n-29}{90}} \right] \text{ at the calculated value with the probability of error}$$

$$0,05 < \alpha < 0,0975 = 3 < 4;$$

- $K_{\max} < [K_0(n)]$ at the calculated value with the probability of error $0,05 < \alpha < 0,0975 = 8 > 5$.

Using the method of least squares, which minimizes the distance between the function graph and the original data, the approximation of the original data was performed. As a result, the following linear trend model was obtained:

$$y_t = 910,3714 + 237,3385t$$

This model shows that the indicator increases by 237.3385 with each time step. To assess the adequacy of the model, an analysis of the residuals was conducted, taking into account the following characteristics: checking the equality of the expected value to zero, the randomness of the residuals, and their compliance with the normal distribution law:

A. The 'peaks' (turning points) criterion gave a value of $4 > 2$, which confirms the adequacy of the model;

$$RS = \frac{e_{\max} - e_{\min}}{S}$$

B. Property being tested – normality: RS criterion (boundary 2.67-3.69) – it corresponds.

With the obtained value of 3.115

$$t_{\text{набл.}} = \frac{|\bar{e}|}{S} \sqrt{n}$$

C. Property being tested – equality of the expected value of the residuals to zero: t-statistic

With the obtained value of 0 – it corresponds, confirming the adequacy. To assess the accuracy of the model, the mean relative approximation error was calculated:

$$E_{\text{OTH.}} = \frac{1}{n} \sum_{i=1}^n \frac{|e_t|}{y_t} \cdot 100\% = 22,15\%$$

The value of which indicates an acceptable level of model accuracy. This model is quite reliable and suitable for forecasting. The results of point and interval forecasting for 2024-2026 are presented in Figure 8.

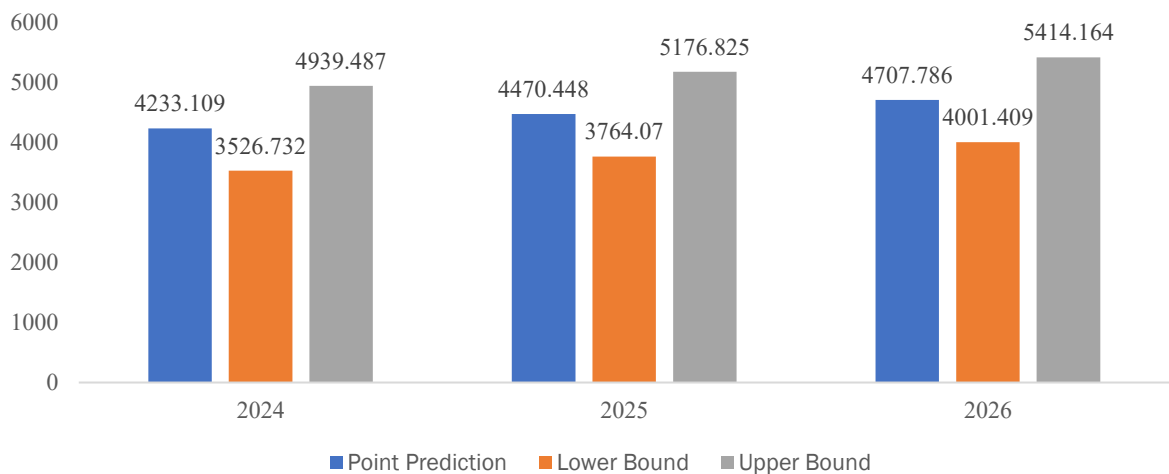


Figure 8. Point and interval forecasts of the number of enterprises with innovations for 2024-2026.

Source: Compiled by the author based on the calculations made.

Innovation funding in tourism can have a significant impact on the development of digital tourism, providing resources for the implementation of new digital technologies and supporting innovative projects (Figure 9).



Figure 9 - Methods of innovation funding that contribute to the development of digital tourism
 Source: Compiled by the author

According to Figure 8, the methods of innovation funding that contribute to the development of digital tourism show the following trends:

A. Research and Development (R&D):

- Innovation financial instruments can be directed towards funding research and development projects in the field of digital technologies for tourism.
- Grants and investments can stimulate the creation of new digital solutions such as apps, virtual tours, and virtual reality technologies.

B. Startups and Incubators:

- Funding for startups specializing in innovative technologies for tourism can foster the emergence of new players in the industry.
- Incubators and accelerators supported by investments can stimulate the development of tech startups in the tourism sector.

Infrastructure and Services:

- Funding for the creation and modernization of digital infrastructure in tourist areas, including high-speed internet, mobile applications, and electronic platforms.
- The development of digital services for tourists, such as online booking, mobile guides, and platforms for information exchange.

Training and Professional Development:

- Investments in the training of tourism industry workers in digital skills.
- Support for professional development programs for tourism enterprises aimed at the effective use of digital tools.

Marketing and Promotion:

- Funding for digital marketing campaigns to promote tourist destinations through online channels.
- Investments in the use of innovative advertising methods, such as virtual and augmented reality.

Innovation funding becomes a key driver for the development of digital tourism, promoting the implementation of new technologies, improving the tourist experience, and creating competitive advantages for the tourism industry. The more the government invests in innovation funding, the more digital tourism will develop in Kazakhstan (Gretzel et al., ???).

State investments in innovation funding in the field of digital tourism can bring numerous benefits and stimulate the development of the tourism industry. Here are several reasons why large government investments can positively impact the development of digital tourism:

- Large investments can contribute to the creation and implementation of advanced digital technologies in tourism, such as virtual reality, artificial intelligence, interactive apps, and other innovative solutions.
- Funding can be directed towards the development of high-speed internet connections, the creation of digital information platforms, and the provision of modern digital infrastructure in tourist areas.
- Investments in education and training programs for tourism industry workers on the use of digital tools can improve professional skills and service levels.
- Funding for startups and innovative projects in digital tourism can stimulate the emergence of new ideas and solutions, enhancing the competitiveness of the industry.
- Government investments create favorable conditions for industry development, which can increase the global competitiveness of the tourist destination.
- Innovation funding can stimulate private companies and entrepreneurs to invest in the development of digital tourism, increasing the overall volume of investments.
- Investments allow for the creation of digital tools that enhance the tourist experience, such as mobile apps, interactive maps, virtual tours, and other digital services.

Large government investments in innovation funding create favorable conditions for the transformation of tourism, making it more technological, accessible, and competitive on the global stage. The survey results among investment companies in Kazakhstan's tourism sector highlight the importance of engaging with digital technologies. The frequency of attracting investments in this sector is high, with many companies attracting investments twice a year or even more often. This may indicate that companies in Kazakhstan's tourism sector actively recognize the role and importance of digital innovations. Investments are likely directed towards the development and implementation of digital solutions such as mobile apps, online services, virtual tours, and other technologies that improve the tourist experience and business process efficiency (Figure 10).

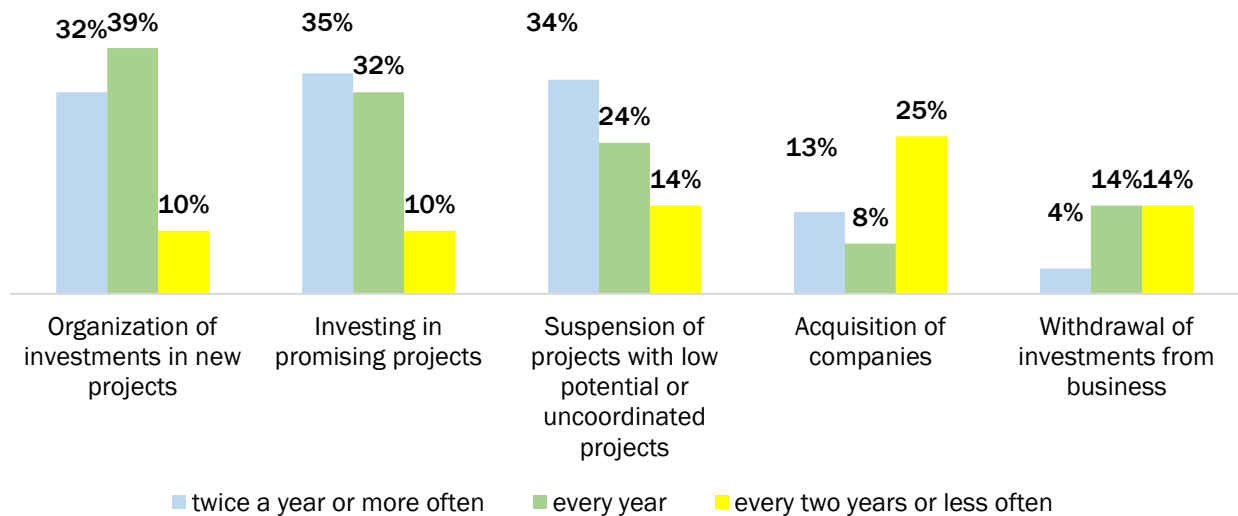


Figure 10. Companies attracting investments in the tourism industry
 Source: compiled by the authors according to <https://www.pwc.com/kz>

This active pace of investment indicates the desire of companies in the tourism industry to be at the forefront of the digital environment, which, in turn, can contribute to the development of digital tourism. Thus, the effectiveness of managerial decisions aimed at developing digital tourism depends on the level of development of the hotel industry, infrastructure, and the service sector. The hypotheses of the study were confirmed:

- The successful integration and use of digital technologies in the tourism sector of the Republic of Kazakhstan contribute to increasing its competitiveness in the global tourism market.
- Digital innovations in Kazakhstan's tourism industry meet the expectations and needs of modern tourists, providing them with convenience, accessibility, and a personalized experience.

- The effective use of digital technologies in tourism contributes to the development of the country's economy by increasing the volume of tourist visits, creating new jobs, and developing related sectors.

CONCLUSION

In recent decades, due to the globalization of the economy and the informational openness of the global community, interest in the theoretical and methodological aspects of organizing tourism activities has increased. As suggestions for further development of digital tourism with the implementation of foreign experience in the context of Kazakhstan, the following can be proposed (Table 8).

For the successful implementation of foreign experience in Kazakhstan, a comprehensive approach is needed, combining infrastructure development, staff training, modernization of the legislative framework, and investment attraction. Considering the unique geographical and cultural features of the country, the digitalization of tourism can become a key driver of economic growth and Kazakhstan's international appeal as a tourist destination.

Despite the effectiveness of many mechanisms and models tested in other countries, the peculiarities of the socio-economic structure of our country require the development of managerial approaches to stimulating the innovative activity of enterprises, including the tourism sector. In a market economy, tourism organizations increasingly recognize the importance of creating new products and services to achieve economic benefits. Thanks to its unique natural and cultural potential, as well as significant interest from tourists from various countries, including distant and nearby regions, Kazakhstan has all the prerequisites for the innovative development of its tourism industry.

REFERENCES

- Abozhina, A.A. (2017), "Analysis of international brands of apart-hotels", *Economy and Society*, No.3, Vol. 34, pp. 1769-1775. <https://doi.org/10.26140/anie-2019-0803-0093>
- Buhalis, D., Amaranggana, A. (2015), "Smart tourism destinations enhancing tourism experience through personalisation of services", *Information and Communication Technologies in Tourism*, pp. 377-389. DOI: 10.1007/978-3-319-14343-9_28
- Chen, W., Du, X., Lan, W., Wu, W., Zhao, M. (2023), "How can digital economy development contribute to quality economic development?", *Technological and Economic Development of Economy*, Vol. 29, No. 4, pp. 1-27. <https://doi.org/10.3846/tede.2023.18784>
- Dogru T., Bulut U. (2018), "Is tourism an engine of economic recovery?", *Theory and empirical evidence from Tourisme*, Vol. 67, pp. 425-434. <https://doi.org/10.1016/j.tourman.2017.06.014>
- Dredge, D., Phi, G.T.L., Mahadevan, R., Meehan, E., Popescu, E. (2019), "Digitalisation in Tourism: In-depth analysis of challenges and opportunities", Executive Agency for Small and Medium-sized Enterprises (EASME), European Commission. <https://ec.europa.eu/docsroom/documents/33163/attachments/1/translations/en/renditions/native>
- Gretzel, U., Sigala, M., Xiang, Z., Koo, C. (2015), "Smart tourism: foundations and developments", *Electronic Markets*, Vol. 25, pp. 179-188. DOI: 10.1007/s12525-015-0196-8
- Gretzel, U., Werthner, H., Koo, C., Lamsfus, C. (2015), "Conceptual foundations for understanding smart tourism ecosystems", *Computers in Human Behavior*, pp. 558-563. DOI: 10.1016/j.chb.2015.03.043
- Hao, J.X. Liu, Y.P. Exploratory (2012), "Study on the Development of Combination of Hotel and Apartmen", *Advanced materials research, Health structure material and environment*, Shenzhen, Dec, 2013, http://www.iberchina.org/files/2017/economic_growth_china_anu.pdf
- Koo, C., Shin, S., Gretzel, U., Hunter, W. C. (2015), "Conceptualization of smart tourism destination competitiveness", *Asia Pacific Journal of Information Systems*, Vol. 25, pp. 99-122. DOI: 10.14329/apjis.2015.25.1.099
- Kulmaganbetova, A.S., Dubina, I.N., Rakhmetulina, Z.B. (2019), "Component-wise assessment of the innovative potential of small and medium-sized businesses: the experience of Kazakhstan", *Economics, Profession. Business*, No. 3, pp. epb201934. <https://doi.org/10.14258/epb201934> (in Russian)

- Li, B., Qin, H., Yu, J. (2019), "Competitiveness assessment and evolution of the structure of China's provincial tourism resources", *Economic Geography*, Vol. 39, No. 9, pp. 232-240 <https://doi.org/10.1186/s12886-019-1233-8>
- Li, Y., Hu, C., Huang, C., Duan, L. (2016), "The concept of smart tourism in the context of tourism information services", *Tourism Management*, pp. 293-300. DOI: 10.1016/j.tourman.2016.03.014
- Musavengane, R. (2019), "Small hotels and responsible tourism practice: Hoteliers' perspectives", *Journal of Cleaner Production*, Vol. 220, pp. 786-799. <https://www.sciencedirect.com/journal/journal-of-cleaner-production/articles-in-press#aip-note> DOI:10.30892/gtg.26322-410
- Myratdurdyev, M., Doroshenko, Y.A. (2017), "Practice of forming the space of apart-hotels". *Current scientific research in the modern world*, Vol. 32, No. 12-9, pp.9-11. <https://doi.org/10.26140/anie-2019-0803-0093> (in Russian)
- Shumakova E. V. (2019), "Apart -hotel as an innovative form of organization of a hotel business", *Azimuth of Scientific Research: Economics and Administration*, Vol. 8, No. 3(28), pp. 400-402 DOI: 10.26140/anie-2019-0803-0093
- Tanina A.V., Kalmykova S.V., Mudrova E. B. (2020), "Problems and prospects of development of the apartment market in St. Petersburg", *Business. Education. Law*, No. 3, pp. 139–146. DOI: 10.25683/VOLBI.2020.52.302.
- Tian J., Tang K., Jin J. (2021), "Can digital finance improve misallocation of resources?", *Journal of Financial Economics*. Vol. 4, pp. 49-60. <https://doi.org/10.1186/s11671-021-03505-2>
- Ying, L., Zi Yi, K., Shizhuan, H., Yan, L., Tongqian, Z. (2024), "The development of digital tourism in China". *Persuasive Social Sciences*, Vol. 10, No. 1, pp. 2347013. <https://doi.org/10.1080/23311886.2024.2347013>
- * <https://tourisonline.kz/>
- **Official resource of the Data from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan, <https://www.stat.gov.kz>
- *** <https://www.pwc.com/kz>

