Л.Н. Гумилев атындағы Еуразия ұлттық университетінің ХАБАРШЫСЫ.
ISSN (Print) 2789-4320. ISSN (Online) 2789-4339

ТУРИЗМ/ TOURISM/ТУРИЗМ

IRSTI 06.71.57
Article type (article)

https://doi.org/10.32523/2789-4320-2025-2-365-385

Assessing readiness and breaking barriers to tourism digitalization: a case study of Kazakhstan

B.S. Shilibekova*[1], R.V. Plokhikh[2]

[1] *Almaty Management University, Almaty, Kazakhstan*
[2] *Al-Farabi Kazakh National University, Almaty, Kazakhstan*

(E-mail: [1]b.shilibekova@almau.edu.kz, [2]roman.plokhikh@kaznu.edu.kz)

Abstract. This study aims to highlight the challenges and most pressing issues in the digitization of the tourism industry in the Republic of Kazakhstan. The primary goal of study is to examine the primary challenges encountered throughout the process of digital transformation in sector and determine strategies to effectively address them. The study utilizes comparative analysis and expert assessment to uncover the limited digitization of tourism firms in comparison to more advanced nations, the absence of high-quality digital infrastructure in rural areas, and insufficient degree of digital literacy among industry participants. The authors paid special attention to considering the existing state of tourism digital technologies, revealing barriers to their implementation and assessing impact on the tourism development. Several central aspects have been identified: infrastructure-type problems, lack of qualified specialists, problems of cybersecurity and protection of information various types, need to adapt the country's legislative framework to new digitalization priorities. The authors' analysis highlights the importance of developing a cohesive national digital strategy and securing financial resources to effectively use digital technology in tourism. The results of the study confirm the problem significance and the authors propose suggestions to develop infrastructure, increase level of digital literacy and stimulate investment.

Keywords: tourism digitalization, digital infrastructure, digital literacy, tourism competitiveness, information system, Kazakhstan.

Introduction

The study focuses on the digitalization of the tourism business in the Republic of Kazakhstan, which is important in the current era of technological advancements. The national economy's

Received 23.02.2025. Revised 17.05.2025. Accepted 14.06.2025. Available online 30.06.2025

[1]*corresponding author

competitiveness, particularly in the tourism sphere, is significantly enhanced by digital transformation. Nevertheless, despite the prevailing patterns of worldwide digitization, the use of digital technology in the tourism sector in Kazakhstan encounters certain obstacles that impede the complete growth of the industry.

The significance of the subject matter stems from various factors:

1. The level of digitalization in the tourism industry of Kazakhstan is not sufficient when compared to advanced countries.

2. Insufficient accesses to digital infrastructure of high quality in certain portions of the country, particularly in rural areas.

3. Insufficient digital literacy among stakeholders in the tourism sphere.

4. Ongoing concerns around cybersecurity and the protection of personal data in the tourism digital ecosystem.

5. Poor representation of Kazakhstan's tourism business in global digital networks and platforms.

The focus of this study is the digitalization aspects within the tourism industry of the Republic of Kazakhstan and examine the difficulties and obstacles that arise during the digitalization of the Kazakhstan's tourism industry and to propose potential solutions to these issues.

The objective of the study is to ascertain the primary obstacles and the most pressing issues pertaining to the digitalization of the tourism sector in Kazakhstan, and to provide some recommendations for overcoming them.

The study aims to achieve the following objectives:

1. To ascertain the primary challenges and obstacles hindering the digital transformation of the tourism sphere.

2. To assess the existing level of digitization in the tourism sector of Kazakhstan.

3. To examine the global implementation of digitalization in the tourism industry and ascertain the most effective strategies.

4. To formulate ways to address the highlighted issues and obstacles in the digitization of tourism in Kazakhstan.

The assumption of the study posits that implementing some coherent national activities for digitizing tourism and establishing high-quality digital infrastructure across Kazakhstan will enhance the worldwide competitiveness of the country's tourism business.

The study's scholarly relevance rests in systematic analysis of the issues surrounding the digitalization of tourism in Kazakhstan, as well as its formulation of targeted solutions to address these challenges.

The study's practical value lies in the development of recommendations that can be utilized by public authorities and stakeholders in the tourism industry to enhance the effectiveness of digital transformation within the sector.

Literature review

Werthner and Klein examine the notion of e-tourism by finding significant transformations in the tourism industry's framework resulting from the advancement of information technology.

The authors discuss the initial versions of digitization in the tourism industry and how they affect the supply chain [1].

Buhalis made a noteworthy contribution to the field of digital tourism by establishing the term "e-Tourism". He conducted a study on the influence of the internet on the marketing and administration of tourism attractions. The author's work introduces a methodical strategy for managing tourism information [2].

Xiang and Gretzel conducted a study that specifically examines the impact of social media on the process of digitizing the tourism industry. The authors examine the impact of user-generated content on the perception of tourism products and services [3].

Buhalis and Sinarta in their study, investigated the significance of smart tourism and its incorporation with big data, artificial intelligence, and the internet of things. The authors highlight the impact of cutting-edge technologies on the generation of value in the tourism sector [4].

Frolova E.A. conducted research on development trends in the field of international tourism. Based on statistical data, she identified the main target audience, which will become the most important for producers of tourism services in the future. The author examined promising opportunities for the development of the tourism industry. Among such opportunities, she points to the following: the development of the digital economy, new groups of consumers of tourism services, a change in orientation towards resource-efficient technologies, innovations in transport services and increased mobility of people [5].

Koo and Chang conducted a study on the application of blockchain technology in the tourism sector with the aim of enhancing trust and transparency in transactions. The authors acknowledge the capacity of blockchain technology to enhance operational efficiency and sustainability [6].

Li Zhiyong et al. note that the conceptual framework of digital tourism has mainly evolved from exploration (2002–2006) and acceleration (2007–2014) to diversification (2015–2023). Among the latest focuses, they point to the creation of consumer value and potential technological risks. The researchers identified three thematic groups of works in tourism: technological innovation and its application; digital management; and consumer value creation. The authors formulated constructive ideas for future research, including digital scenarios, digital production and digital management [7].

Kumar S. et al. are received valuable information from highly cited articles in the Web of Science and Scopus databases, revealing their contribution to the digital transformation of the tourism sector. In study the trends and challenges in the tourism digitalization were identified [8].

Raji M.A. et al. explore digital marketing as a promising tool in the tourism industry. The article provides a comprehensive overview of digital marketing methods in the United States and Africa, highlighting their similarities, differences and emerging trends. For example, in the United States, social media, search engine optimization (SEO) and content marketing are used. In Africa, the digital marketing by a combination of traditional and modern approaches is characterized. Some countries struggle with infrastructural challenges, while others use digital platforms to showcase rich cultural and natural attractions. Social media campaigns, mobile apps and partnerships with travel influencers to increase visibility are used [9].

Luo H. et al. examined the issue of digital financial inclusion for tourism development. Based on a sample of 281 Chinese prefecture-level cities from 2011 to 2018, they found that digital financial inclusion was positively associated with tourism development by increasing

stakeholder participation in the financial market, encouraging tourism entrepreneurship and increasing tourist service consumption [10].

Chen W. and Huang M. were examined the issues of payment digitalization in 2017 and 2019 based on the household finance survey data in China to identify its impact on tourism consumer spending and determine the moderating effects of transportation infrastructure. They confirmed that payment digitalization stimulates consumer spending and promotes the improvement of transportation infrastructure for tourism development [11].

Mendieta-Aragón A. et al. analyze the intensity of the use of digital platforms in the European Union in recent years. They point to the active work in digital on regulations and public policies. Based on spatial econometric methods, the authors carried out a comparative analysis that revealed regional inequalities in terms of the saturation of demand for digital platforms in tourism [12].

Methodology

To achieve the objective of the study, a combination of qualitative and quantitative scientific methods was used. The methodology was developed to systematically analyze the current state of digitalization in the tourism sector, identify key issues, study best international practices and develop recommended solutions. It provides a comprehensive study by integrating analytical data, expert opinions and case study assessments (Figure 1).

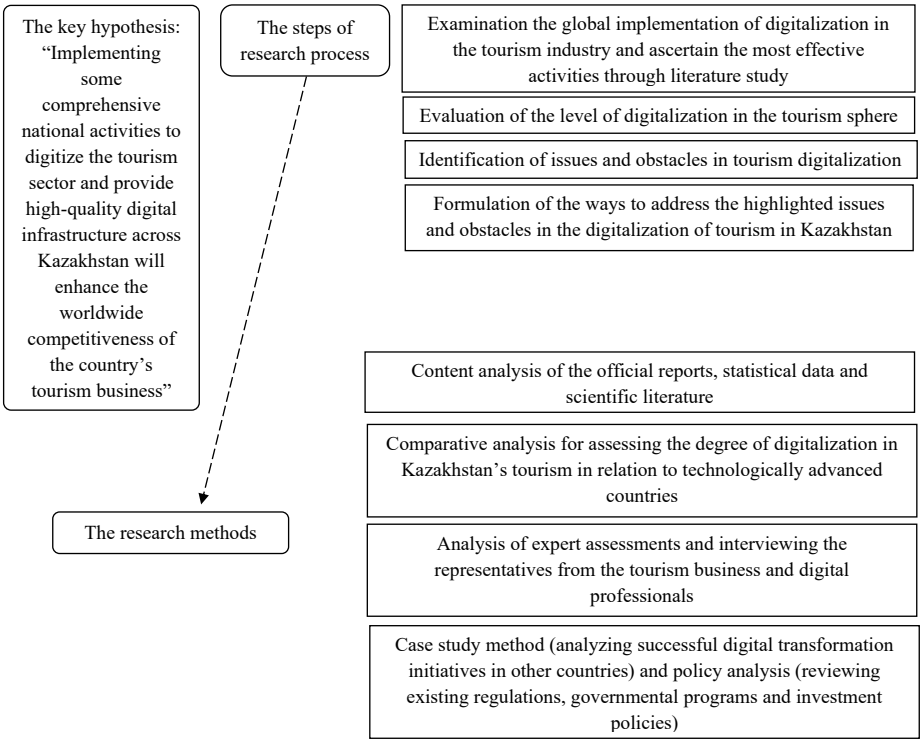

Figure 1. Logical structure of research methodology

Note: compiled by authors

The key hypothesis of the investigation was formulated by the authors as follows: "Implementing some comprehensive national activities to digitize the tourism sector and provide high-quality digital infrastructure across Kazakhstan will enhance the worldwide competitiveness of the country's tourism business".

The research process included the several steps: 1) examination the global implementation of digitalization in the tourism industry and ascertain the most effective activities through literature study; 2) evaluation of the level of digitalization in the tourism sphere: a) gathering and examining data on the present level of digitization in the tourism sector of Kazakhstan using statistical reports and government documents; b) identification of key digitalization indicators, including the extent of digital technology use by businesses and the accessibility of digital services for visitors; 3) identification of issues and obstacles: a) conducting a thorough analysis of expert assessments and academic research in order to identify the primary obstacles and difficulties associated with the process of digitalizing the tourism industry [13, 14]; b) interviewing the representatives from the tourism business and digital professionals; 4) formulation of the ways to address the highlighted issues and obstacles in the digitization of tourism in Kazakhstan.

The following research methods were used by the authors: 1) comparative analysis (assessing the degree of digitization in Kazakhstan's tourism business in relation to technologically advanced countries such as Singapore, South Korea, China, Israel, Latvia, and Estonia): analyzing comparative statistics on the proportion of information and communication technologies (ICT) exports and imports in relation to the overall exports and imports of products; 2) content analysis involves examining official reports from the Ministry of Tourism and Sports of the Republic of Kazakhstan, as well as statistical data and scientific literature: a) examination of regulatory papers pertaining to the digitization of the tourism industry in Kazakhstan; b) system analysis for thoroughly analyze the issue of digitalizing tourism; c) considering the influence of multiple elements on the digitalization process and the interconnectedness among them.

The study utilize the statistical data obtained from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan, which provides official information on the digitization of the industry' sectors. The Ministry of Tourism and Sports reports of the current status and progress of the tourism branch were used too.

Results and discussion

Digitalization has significantly transformed the global tourism industry, increasing efficiency, personalization and accessibility for travelers. Countries and businesses that have adopted digital tools have seen improvements in customer engagement, operational efficiency and overall competitiveness. Figure 2 shows the levels of adoption of various digital technologies in the tourism around the world. It shows that online booking, social media, and e-government services have a high level of integration, while blockchain and IoT technologies are developing more slowly.

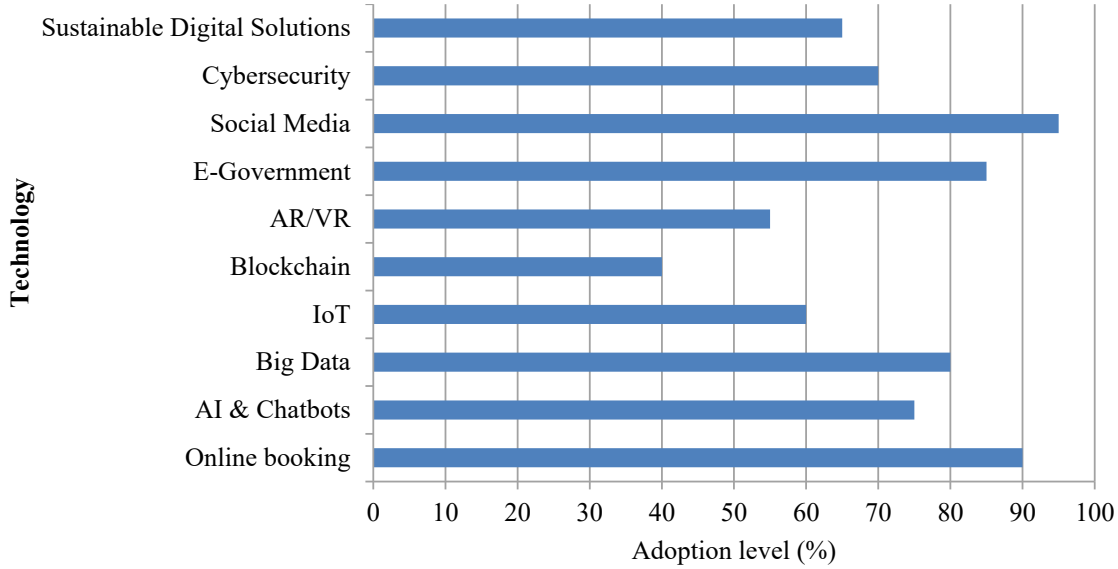

Figure 2. Global adaptation level of digital technologies in tourism

Note: compiled by authors based on the content analysis of official reports, statistical data and scientific literature, as well as expert assessments and interviews with representatives of the tourism business and digital specialists

Figure 3 shows the comparative effectiveness of various digitalization strategies in the tourism industry. The most effective are considered to be the development of national digitalization strategies, the introduction of artificial intelligence and automation, and the strengthening of cybersecurity measures. At the same time, blockchain payments and IoT infrastructure do not yet demonstrate such high efficiency, but have the potential for further growth.

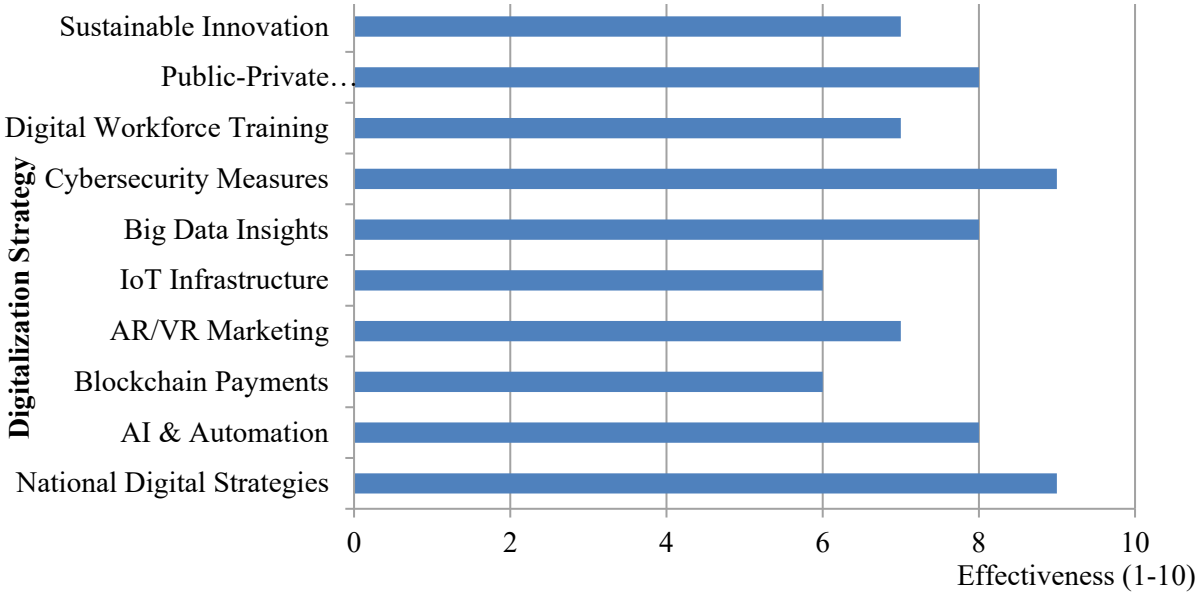

Figure 3. Comparative effectiveness of various digitalization strategies in the tourism industry

Note: compiled by authors based on the content analysis of official reports, statistical data and scientific literature, as well as expert assessments and interviews with representatives of the tourism business and digital specialists

The figure 4 reported by the Central State Organizations of the Republic of Kazakhstan suggest that there are favorable developments in the area of digitalization [15]. Kazakhstan ranked 29th out of 193 nations in the 2023 end-of-year report for the level of the Electronic government development (E-government). This represents an increase of 10 positions compared to the previous three years [16].

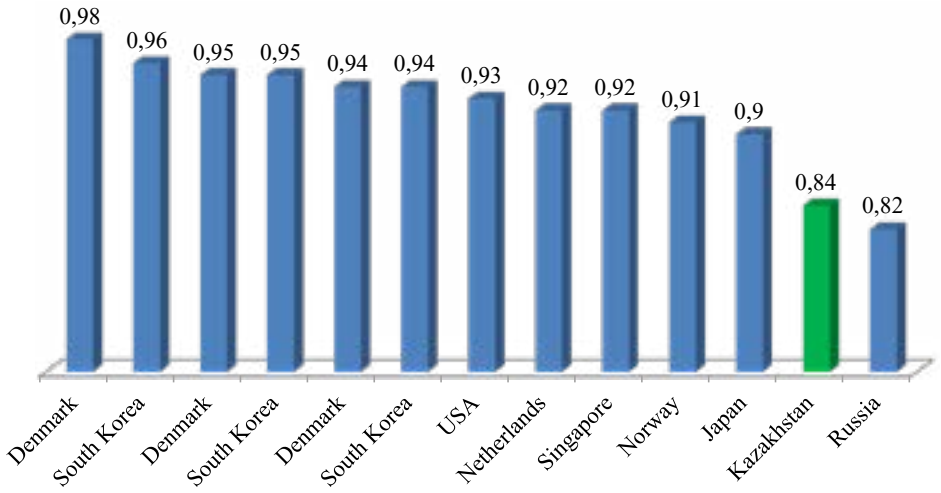

Figure 4. Displays the placement of Kazakhstan in the 2023 ranking of E-government development

Note: compiled by authors based on the data from [16]

Based on this measure, Kazakhstan ranks lower than several countries including Israel (30th), Russia (36th), China (45th), Uzbekistan (87th), India (100th), and others. Kazakhstan holds a favorable position in the global network readiness ranking, securing the 56th spot out of 134 nations. This places Kazakhstan ahead of countries like Turkey (57th), Ukraine (64th), and Belarus (65th) (Figure 5) [17, 18].

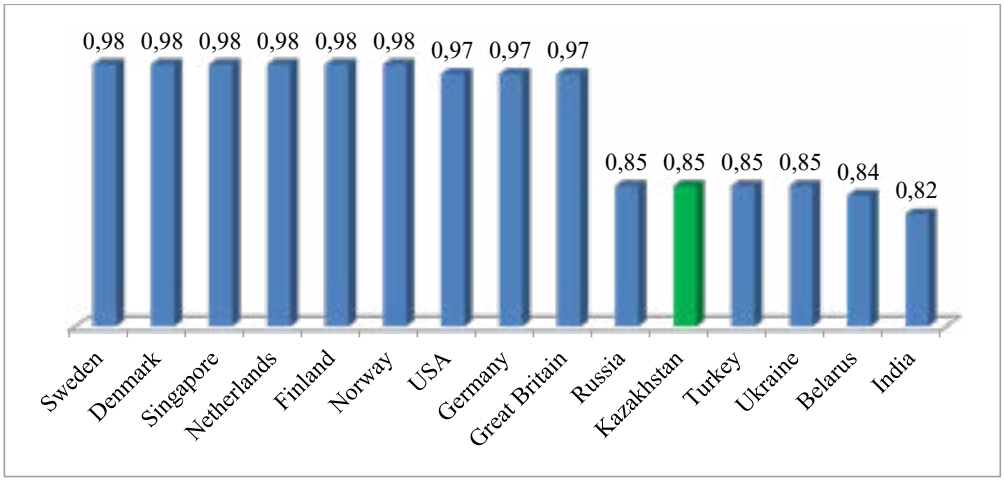

Figure 5. Kazakhstan's rating in the Global Network Readiness Index for the 2023

Note: compiled by authors based on the data from [16]

In both the corporate and public sectors, it is worth noting that there has been a 1.9% increase in the proportion of large and medium-sized industrial enterprises adopting digital technologies over the past two years. This increase is observed both at the national level in Kazakhstan, as well as in specific regions. The highest proportion of such enterprises can be found in Atyrau (15.2%), West Kazakhstan (12.9%), Kyzylorda (12.1%), East Kazakhstan (11.1%), and Karaganda (11%) regions [16].

78.7% of users in Kazakhstan utilize the Internet for the purpose of posting information or engaging in instant messaging. Additionally, 71.8% of users participate in social networks, while 62.3% use the Internet to download movies, images, music, watch videos, listen to music, play games, or download games. Furthermore, 38.6% of users seek information about goods and services, and 36.1% use the Internet for sending and receiving e-mails. Hence, the Internet is primarily utilized by individuals for recreational purposes, rather than for professional endeavors or personal development [18].

The extent and effects (both positive and negative) of digitalization on socio-economic development are influenced by various factors, including the proficiency of management personnel, the expertise and qualifications of digital technology developers, the effectiveness of regulatory and legislative measures, the accessibility and quality of information and communication infrastructure, among others (Table 1).

Table 1. Comparative analysis of nations with advanced digital economies, focusing on the proportion of ICT exports and imports in relation to the overall volume of export and import products, %

No.	Countries	Share of exports of ICT goods in total exports of goods, %	Share of imports of ICT goods in total imports of goods, %
1	Singapore	34.2	33.4
2	South Korea	29.4	18.5
3	China	27.6	25.6
4	Israel	14.5	10.8
5	Latvia	11.4	11.3
6	Estonia	9.9	8.1
7	Kazakhstan	0.3	7.8

Note: compiled by authors using [10]

In order to evaluate the efficacy of investment in digitalization and its impact on socio-economic development, official data from 2016 was used to analyze the ratio of qualitative indicators such as exports and imports of information and communication technology (ICT) goods. Based on this analysis, it can be concluded that the share of ICT goods exports in the Kazakhstan's total exports is significantly lower compared to other countries with well-developed economies.

The cumulative ICT expenses from 2016 to 2023 reached a total of 2,484,856.4 million KZT, with public administration accounting for 310,668.2 million KZT or 13% of the whole expenditure (the private sector accounting for the remaining 87%) (Figure 6). In 2023, the

total volume of ICT costs increased by 168,080.8 million KZT (or 76%) compared to 2016. The majority of these costs, amounting to 696,732.9 million KZT or 42.5%, were attributed to payment for services provided by third-party organizations and specialists (outsourcing) in the field of information technology [16].

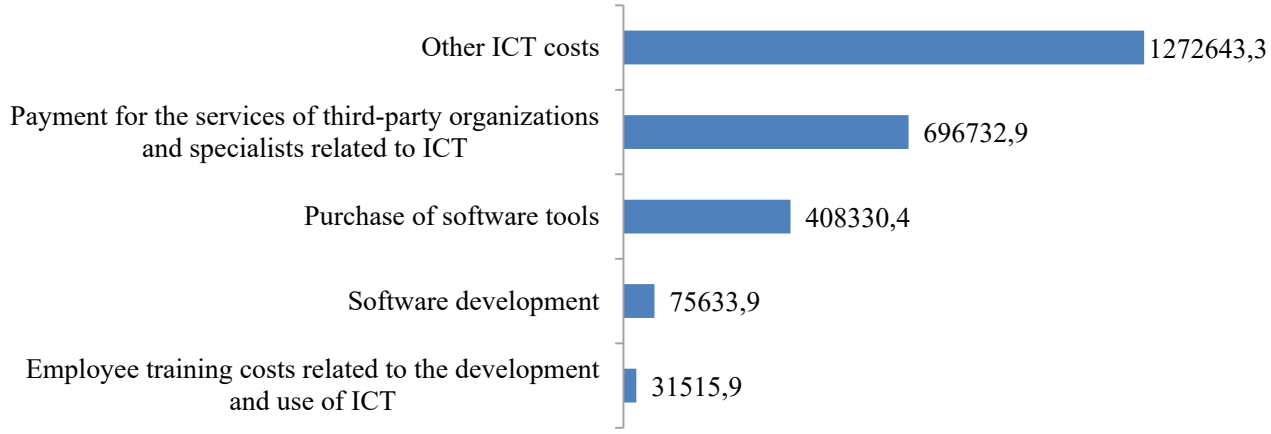

Figure 6. Amount of money spent on ICT in the Kazakhstan from 2016 to 2023, as well as the breakdown of these expenditures, million KZT

Note: compiled by authors based on the data from [16]

Furthermore, there are considerable expenses linked to the procurement of software under a license agreement. These costs accounted for 16.6% of the total at the conclusion of the investigated period, showing favorable growth trends (9.7% in 2016 and 16.6% in 2023). The demand for IT specialists has significantly expanded, with a growth rate of 63% between 2016 and 2023 (4,449 individuals in 2016 and 7,038 people in 2023). In contrast, the organization allocated a relatively small portion of its total costs to independent software development and employee training for ICT usage by the end of 2023 (4.4% and 0.3% respectively). The latter category experienced a decline in its share from 1.5% in 2016 to 0.3% in 2023 [16].

The analysis of the production and sales volume of products and services in the ICT industry as a percentage of the overall GDP from 2016 to 2023 revealed a consistent upward trend. By the end of 2023, this percentage reached 4.8% of the GDP (Figure 7).

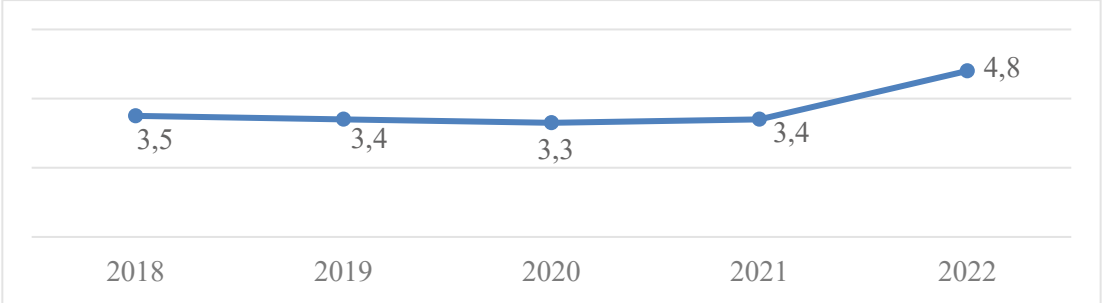

Figure 7. Production and realization of products and services in the ICT industry as a proportion of the total GDP for the 2018–2022, %

Note: compiled by authors based on the data from [16]

By the end of 2023, a large portion of the industrial production is dedicated to the manufacturing of computers and peripherals, accounting for 54.3% (or 14,166.1 million KZT) of the total. This represents a significant increase of 10,955.2 million KZT (or 341.2%) compared to the period from 2016 to 2023. Additionally, 36.1% of the production is allocated to the manufacturing of communication equipment, amounting to 9,426.9 million KZT [16].

The issue of internet access quality became especially severe during the pandemic and quarantine period. The high volume of internet traffic and increased demand from the population overwhelmed the existing capacity, resulting in frequent system failures and interruptions. For instance, the Egov (Kazakhstan's E-government site) experienced access issues due to the transfer of numerous functions from the Central Statistical Office. Additionally, the website of the labor exchange "Epbek.kz" encountered difficulties as a result of a large number of people applying for social benefits. A multitude of grievances and complaints arose during this period over the remote system of secondary education, as numerous parents and students encountered difficulties in accessing classrooms, not just in rural areas but also in urban centers [18].

Furthermore, the significance of slow Internet speed is not overlooked. Based on the data from feedback channels such as Instagram and Facebook, it is clear that the population of Almaty, a large city, is still limited to using ADSL-connection with a maximum speed of 8 Mb/s. This type of connection is prone to frequent losses and failures, unlike fiber-optic networks. The issue of the unfair business model of telecom operators in the Republic of Kazakhstan, where consumers of fixed Internet are promised Internet connection with certain parameters but receive a worse connection in reality, remains unresolved.

The Ministry of Tourism and Sports oversaw the execution of two initiatives as part of the State Program.

The implementation of the "Unified Electronic Document Archive" Information System (UEDA IS) was completed after the specified timeframe. The deadline was set for December 2023; however, the UEDA was put into commercial operation on September 27, 2021. Furthermore, "InesSoft" LLP failed to meet the deadline for commissioning the UEDA IS into commercial operation. Despite the deadline being set for December 31, 2023, the commissioning was not completed until September 27, 2021, which is a violation of Article 272 of the Civil Code and subparagraph 1) of paragraph 4.1 of the Contract. The user did not provide any text. The implementation of Activity 66, which aimed to digitize cultural assets, was not carried out within the specified deadline of December 2021. The state archives have identified multiple flaws and deficiencies in the implementation of the UEDA IS. These issues can be attributed to the inadequate development of technical requirements for individual tasks and variations from the original concept. The deficiencies in the performance of the UEDA IS might also be attributed to the limited capacity of communication channels utilized by local executive bodies. Based on the reports provided, the average speed of communication channels in the settlements is 1–2 megabits per second, and in certain rural districts, it is as low as 250–270 kilobytes, which hinders the ability to operate with information systems [18].

Therefore, it is observed that the UEDA IS does not contain the fonds and documents that were previously submitted. The state archives are still issuing archival certificates through the "E-Akimat" IS, namely when applying through the Center. However, the usage of this system was

supposed to be discontinued after the implementation of the UEDA IS. Out of the total of 223 state archives, only two are currently linked to the web-portal designed for citizens to submit archival records online. As a result, remote access to archival documents is not available. The functions of expert evaluation of document value have not been implemented [18].

In the period from 2018 to 2023, the Ministry of Tourism and Sports provided "NIH «Zerde»" JSC with a transfer of 125.9 million KZT for project management services. This amount also includes funds for participation in the commissioning, which amounts to 2.1 million KZT. Nevertheless, "NIH «Zerde»" JSC failed to comply with paragraph 87 of the Uniform Requirements in the field of information and communication technologies and information security, as stated in the No. 832 Government Decree dated December 20, 2016. Consequently, they did not participate in the commissioning of the UEDA IS. Additionally, "NIH «Zerde»" JSC did not fully provide information and communication services, such as leasing communication channels and hosting servers. As a result, the planned financing for 2018-2019 was reduced by 30.2 million KZT. Furthermore, the functioning of UEDA IS is in breach of subparagraph 2) of paragraph 2 of paragraph 2 of Article 40 of the "On Informatization" Law of RK due to the absence of essential backup servers [18].

The Ministry of Tourism and Sports violated subparagraphs 6) and 9) of paragraph 2 of Article 40 of the Law of RK "On informatization" by entering into a contract with "IServ" LLP on September 15, 2021. The contract is for the maintenance of the system, with a total cost of 99.9 million KZT. This amount includes payment for the elimination of defects, which falls under the warranty service provided by the system developer, "InesSoft" LLP, for a period of 12 months starting from the date of the system's commercial operation. The Ministry of Tourism and Sports paid "Serv" LLP a sum of 5.1 million KZT for the developer's warranty service, based on the completed work [18].

On January 28, 2019, the President of the Republic of Kazakhstan directed the Ministry of Tourism and Sports to explore the feasibility of integrating the Archive of the President of the Republic of Kazakhstan with the UEDA IS. Unfortunately, the feasibility study and terms of reference (TOR) for the development of the UEDA IS did not include provisions for connecting the Archive of the President and other government entities, which are the sources of its data collecting. This lack of consideration also disregarded the potential for deploying the system in a different data center.

As per the Roadmaps, the Ministry of Tourism and Sports was given the responsibility in the initial stage to assess the possibility of linking the Archive of the President. However, this task was not completed, although the Ministry of Tourism and Sports did begin the process of connecting the Archive of the President to the UEDA IS.

Nevertheless, the Ministry of Tourism and Sports failed to fulfill the order from the Presidential Administration of the RK to connect the Archive of the President of the RK to the UEDA IS during the period of 2021–2023. This was due to shortcomings in the system and the requirement for extra work that was not anticipated in the feasibility study and Terms of Reference. Identifying the obstacles and foremost issues in the process of digitizing the tourism business were done. Within the corporate and public sectors, it is important to note that the percentage of large and medium-sized industrial enterprises adopting digital technologies has risen by 1.9% over the

past two years. This increase has been observed both at the national level in Kazakhstan and within specific regions. The majority of these firms are located in the Atyrau (15.2%), West Kazakhstan (12.9%), Kyzylorda (12.1%), East Kazakhstan (11.1%), and Karaganda (11%) areas [18].

Notwithstanding this expansion, the digitalization of the tourism sector in Kazakhstan encounters several hurdles and issues, with the most pressing ones being:

– inadequate digital infrastructure: rural and distant locations suffer from a deficiency in high-speed internet and digital infrastructure, resulting in limited access to digital services for tourists [19];

– disorganized data management: disparate data collection methods and absence of centralized databases create challenges in efficiently managing information and delivering customized services;

– insufficient digital literacy: the lack of digital literacy among small and medium-sized enterprises (SMEs) in the tourism industry acts as a barrier to the implementation of digital solutions;

– cybersecurity and privacy risks: the increasing prevalence of cyber-attacks and data breaches is a potential danger to both tourism enterprises and travelers;

– subpar digital service quality: noticeable disparities in the quality of digital services offered (websites, mobile applications) detrimentally affect user experience;

– insufficient content in various languages: the absence of localized content in several languages poses obstacles for international travelers;

– limited acceptance of digital payment systems: the widespread use of cash payments and the poor uptake of digital payment methods in various areas impede the progress of digital transformation;

– insufficient integration with global systems: the absence of integration between local and international systems obstructs the process of arranging travel;

– regulatory impediments: obsolete restrictions hinder digital innovation;

– insufficient financial resources for digital transformation: numerous tourism enterprises encounter challenges in securing funding for projects related to digital transformation;

– importance of a consolidated digital strategy: the absence of a cohesive nationwide digitalization plan results in scattered endeavors.

78.7% of users in Kazakhstan utilize the internet for the purpose of posting information or engaging in instant messaging. Additionally, 71.8% of users participate in social networks, while 62.3% use the internet to download movies, images, music, watch videos, listen to music, play games, or download games. Furthermore, 38.6% of users seek information about goods and services, and 36.1% use the internet to send and receive e-mail. Hence, the majority of individuals utilize the Internet mostly for recreational purposes rather than for business or self-improvement [20].

In the context of the overall increase in ICT costs, which rose by 168,080.8 million KZT (or 76%) from 2016 to 2023, the majority of these costs are attributed to payments for services provided by external organizations and specialists (outsourcing) in the field of information technology, amounting to 696,732.9 million KZT or 42.5%.

Digitalization is a key factor in increasing the competitiveness and efficiency of tourism. In Kazakhstan, the introduction of digital technologies in tourism is gradually expanding, driven by global trends and government initiatives. However, the level of digital transformation varies across different segments of the tourism, with some areas showing significant growth and others facing ongoing challenges (Table 2).

Table 2. Assessing the existing level of the tourism industry digitalization in Kazakhstan, points

Digitalization components	Development level (1-5)*	Importance for tourism development	Example
Online booking platforms	4	Increases accessibility and convenience for travelers	Booking.com, Kazakh travel agency websites
E-Government services for tourism	3	Facilitates visa applications, permits, and licenses	eGov.kz for electronic visas
Digital payment systems	4	Enhances ease of transactions for tourists	Kaspi Pay, Halyk Bank payments
Smart tourism infrastructure	2	Improves the visitor experience with interactive solutions	Smart city solutions in Astana
Virtual and augmented reality	2	Enhances cultural and historical tourism experiences	VR tours of historical sites
Digital marketing and social media promotion	5	Boosts tourism visibility and attracts international visitors	Instagram campaigns, influencer marketing
Big Data and AI for tourism analytics	3	Supports decision-making and demand forecasting	AI-driven tourism trend analysis
Mobile applications for tourists	4	Provides essential travel information and navigation	Kazakh tourism apps like iTourist
Cybersecurity and data protection	3	Ensures the safety of digital transactions and personal data	Cybersecurity policies for travel agencies
Smart transportation and mobility solutions	4	Enhances convenience and connectivity for tourists	Yandex Go, public transport e-tickets
Online travel reviews and rating systems	4	Influences tourist decision-making and service quality	Tripadvisor, Google Reviews
Chatbots and AI assistants for tourists	3	Provides instant support and personalized recommendations	AI chatbots on tourism websites
Internet and Wi-Fi Infrastructure	4	Ensures connectivity for tourists in urban and rural areas	Free Wi-Fi zones in hotels and airports

Blockchain for secure transactions	2	Enhances trust in financial and booking processes	Blockchain-based booking systems
Smart hotel technologies	3	Improves guest experience with automation	Keyless entry, smart room controls
E-learning and digital training for tourism professionals	3	Enhances workforce skills and service quality	Online courses on tourism management
Digital nomad and remote work infrastructure	2	Attracts long-term international visitors	Coworking spaces, special visa programs
IoT (Internet of Things) for tourism	2	Optimizes tourism services and experiences	Smart sensors in hotels and attractions
Cloud computing for tourism businesses	3	Enhances data storage, processing, and security	Cloud-based booking and CRM systems
Digital guidebooks and audio tours	4	Improves accessibility to cultural and historical information	Mobile apps for self-guided tours
* Development levels 1–5: 1 – basic or minimal use of digital technologies, no digitalization strategies; 2 – emerging or initial implementation of digital solutions, limited coverage; 3 – moderate or partial digitalization, implementation of individual technologies, but no comprehensive approach; 4 – advanced or extensive use of digital solutions, integration of technologies into core business processes; 5 – innovative or high level of digitalization, use of advanced technologies such as AI, Big Data, blockchain.			

Note: compiled by authors

The results of assessing the current state of tourism digitalization in Kazakhstan by analyzing key digital components, their levels of development, and their impact on the industry revealed significant gaps.

Conclusions

Suggestions to address the highlighted issues and obstacles in the digitization of tourism in Kazakhstan can be following:

– inadequate digital infrastructure: a) infrastructure development: establish a collaborative arrangement between the public and private sectors to enhance the reach of high-speed Internet in rural and isolated regions; b) subsidies and incentives: implement financial assistance for telecom operators, motivating them to establish networks in areas characterized by sparse population density;

– disorganized data administration: a) centralized platform: create a nationwide centralized data management platform that combines all tourism services; b) data standardization: enforce consistent protocols for gathering, organizing, and exchanging data across participants in the tourism business;

– insufficient proficiency in digital skills: a) training initiatives: create specialized training programs aimed at enhancing digital skills for small and medium-sized enterprises (SMEs)

operating within the tourism sector; b) conduct information campaigns to disseminate knowledge about the advantages of digital technologies;

– risks associated with cybersecurity and privacy: a) compulsory regulations: implement obligatory cybersecurity measures for travel companies; b) organize frequent lectures and training sessions on cybersecurity specifically tailored for staff working in travel organizations;

– substandard quality of digital services: a) certification and monitoring: implement a quality certification process for digital services and build a system for monitoring and ensuring quality control; b) optimal methods: create and execute optimal standards for websites and mobile applications pertaining to tourism services.

In 2024, the digitalization of the tourism industry in the Republic of Kazakhstan is confronted with significant obstacles, including inadequate digital infrastructure, fragmented data management, and a low level of digital literacy, among others. The analysis identified the primary obstacles and provided precise suggestions to address them.

In order to achieve a successful digital transformation of the tourism industry, it is imperative to establish a cohesive national strategy for digitalization, collaborate across the public and commercial sectors, and secure adequate funding. Implementing a state digitization plan, enhancing infrastructure, and establishing a favorable regulatory environment will enhance the worldwide competitiveness of the national tourism business [21, 22].

The practical value of this study is in the formulation of precise recommendations to enhance the efficacy of digitalization in the tourism sector of Kazakhstan. These recommendations can be utilized by both governmental bodies and stakeholders in the tourism industry. Implementing the suggested solutions will enhance investor attraction, enhance the quality of digital services, and bolster Kazakhstan's standing as an appealing tourism destination.

Information about financing

Researches was developed within the realization framework of the project IRN 19175225 "Development of a conceptual model of the digital ecosystem of the tourism industry of Kazakhstan for its forced development" on grant financing of young scientists on scientific and (or) scientific-technical projects for 2023-2025. The source of financing is the Ministry of Science and Higher Education of the Republic of Kazakhstan.

Acknowledgment, conflict of interest

The article was written as part of a project funded by the Ministry of Science and Higher Education of the Republic of Kazakhstan. Authors have no conflicts of interest.

The contribution of the authors

Shilibekova Balzhan influences to present study include the following aspects: literature review (the author conducted an examination of prevailing literature to compare the degree of tourism sector digitalization in developed countries; she observed publications which related to digital infrastructure, literacy levels and national digitalization strategies); conducting a pilot study (as part of the research, the author used expert assessment method to detect limits in the tourism sector digitalization; she investigated the present-day position in the Kazakhstan

tourism industry, paying special attention to the lack of high-quality digital organization in rural areas and the insufficient level of digital literacy among industry participants); working with the text of the article (the author structured the text, giving a wide-ranging summary of the state digitalization in Kazakhstan tourism; she is prepared the text, table and figure according to the requirements of the journal).

Plokhikh Roman influences to researches include the following aspects: idea formation (the author developed a research idea aimed at recognizing problems and critical issues in the digitalization of the Kazakhstan tourism sector; he identified the core goal of the researches – to revision the main challenges arising in the process of digital transformation of the tourism industry); examination and separation of investigation results (the author summarized the results, emphasizing the importance of developing a unified national digital strategy and providing resources for the effective use of digital technologies in tourism and identified key issues holding back digitalization and offered recommendations to improve infrastructure, increase digital literacy and stimulate investment; he formulated proposals to improve the tourism sector effectiveness, ensuring the scientific validity and accessibility of the records).

Both authors' contribution covers all stages of the researches from idea to final preparation of the article, including data collection and analysis, as well as the formulation of recommendations and conclusions.

References

1. Werthner H., Klein S. Information technology and tourism – A challenging relationship. – Vienna: Springer-Verlag, 1999. – 343 p.

2. Buhalis D. eTourism: Information Technology for Strategic Tourism Management. – Harlow: Financial Times Prentice Hall, 2003. – 376 p.

3. Xiang Z., Gretzel U. Role of Social Media in Online Travel Information Search // Tourism Management. – 2010. – 31(2). – P. 179-188. doi: https://doi.org/10.1016/j.tourman.2009.02.016

4. Buhalis D., Sinarta Ye. Real-time co-creation and nowness service: lessons from tourism and hospitality // Journal of Travel & Tourism Marketing. – 2019. – 36(5). – P. 563-582. doi: https://doi.org/10.1080/10548408.2019.1592059

5. Фролова Е.А. Тенденции и проблемы развития мирового туризма // Вестник университета. – 2019. – № 3. – С. 61-65. doi: https://doi.org/10.26425/1816-4277-2019-3-61-65

6. Koo C., Chang Ye. Guest editorial: new technologies for the tourism and hospitality industry // Industrial Management and Data Systems. – 2021. – 121(6). – P. 1145-1151. doi: https://doi.org/10.1108/IMDS-06-2021-742

7. Li Z., Huo M., Huo T., Luo H. Digital tourism research: a bibliometric visualization review (2002–2023) and research agenda // Tourism Review. – 2024. – Vol. 79. – No. 2. – P. 273-289. doi: https://doi.org/10.1108/TR-03-2023-0176

8. Kumar S., Kumar V., Kumari Bhatt I., Kumar S., Attri K. Digital transformation in tourism sector: trends and future perspectives from a bibliometric-content analysis // Journal of hospitality and tourism insights. – 2024. – Vol. 7. – No. 3. – P. 1553-1576. doi: https://doi.org/10.1108/JHTI-10-2022-0472

9. Raji M.A., Olodo H.B., Oke T.T., Addy W.A., Ofodile O.C., Oyewole A.T. Digital marketing in tourism: a review of practices in the USA and Africa // International Journal of Applied Research in Social Sciences. – 2024. – Vol. 6. – No. 3. – P. 393-408. doi: https://doi.org/10.51594/ijarss.v6i3.896

10. Luo H., Wang H., Wu Y. Digital financial inclusion and tourism development // International Review of Economics & Finance. – 2024. – Vol. 90. – P. 207-219. doi: https://doi.org/10.1016/j.iref.2023.12.001

11. Chen W., Huang M. Improvement of transportation infrastructure, payment digitalization, and tourism consumption expenditure: analysis based on CHFS data // Finance Research Letters. – 2025. – 107000 (in press, journal pre-proof). doi: https://doi.org/10.1016/j.frl.2025.107000

12. Mendieta-Aragón A., Rodríguez-Fernández L., Navío-Marco J. Tourism usage of digital collaborative economy platforms in Europe: situation, behaviours, and implications for the digital policies // Telecommunications Policy. – 2025. – Vol. 49. – No. 1. – P. 102874. doi: https://doi.org/10.1016/j.telpol.2024.102874

13. Устинова Н.Г., Шевченко М.В. Индустрия гостеприимства в эпоху цифровизации // Эпоха науки. – 2019. – № 20. – С. 453-457. doi: 10.24411/2409-3203-2019-12095

14. Богомазова И.В., Аноприева Е.В., Климова Т.Б. Цифровая экономика в индустрии туризма и гостеприимства: тенденции и перспективы // Сервис в России и за рубежом. – 2019. – № 3(85). – С. 34-47. doi: 10.24411/1995-042X-2019-10303

15. Озимина Л.А. Цифровые каналы и методы продвижения комплексных туристских услуг // Известия СПбГЭУ. – 2019. – № 2(116). – С. 146-151.

16. Об утверждении Концепции цифровой трансформации, развития отрасли информационно-коммуникационных технологий и кибербезопасности на 2023-2029 годы / Постановление Правительства Республики Казахстан от 28.03.2023 года № 269 [Электронный ресурс]. – URL: https://adilet.zan.kz/rus/docs/P2300000269 (дата обращения 01.09.2023).

17. Нуркатов А.А. Методическое создание механизма повышения эффективности управления региональной сетью телекоммуникационных услуг // Петербургский экономический журнал – 2019. – № 1. – С. 197-205. doi: 10.25631/PEJ.2019.1.149.160

18. Региональный статистический ежегодник Казахстана: Бюро национальной статистики Агентства стратегического планирования и реформ Республики Казахстан [Электронный ресурс]. – URL: https://stat.gov.kz/ru/publication/collections/?year=&name=21075&period= (дата обращения 25.05.2023).

19. Рянцев А.А., Гусаков М.А., Замятина М.Ф., Максимов В.В., Смирнова Г.П., Шабунина Т.В., Щелкина С.П. Методология исследования социально-экономических процессов в научно-инновационной сфере региона: отчет о НИР 96-06-80066, Российский фонд фундаментальных исследований [Электронный ресурс]. – URL: https://elibrary.ru/download/elibrary_230104_44509103.htm (дата обращения 27.09.2023).

20. Шабунина Т.В., Щелкина С.П. Проблемы информатизации эколого-экономического пространства региона в контексте инновационного развития // Журнал правовых и экономических исследований. – 2015 – № 1. – С. 208-212.

21. Telecommunications Industry Outlook: 5G ushers in a new world of opportunities [Электронный ресурс]. – URL: https://www.readkong.com/page/2019-telecommunications-industry-outlook-3162681 (дата обращения 27.09.2023).

22. Об утверждении Прогнозной схемы территориально-пространственного развития страны до 2030 года / Указ Президента Республики Казахстан от 09.10.2019 года № 185 [Электронный ресурс]. – URL: https://adilet.zan.kz/rus/docs/U1900000185 (дата обращения 19.05.2023).

Б.С. Шилибекова*[1], Р.В. Плохих[2]
[1]Алматы Менеджмент Университеті, Алматы, Қазақстан
[2]Әл-Фараби атындағы Қазақ ұлттық университеті, Алматы, Қазақстан

Дайындықты бағалау және туризмді цифрландыруға кедергілерді жою: Қазақстанның кейс зерттеуі

Аңдатпа. Бұл зерттеу Қазақстан Республикасындағы туризм индустриясын цифрландыру үдерісіндегі мәселелер мен ең өзекті сұрақтарды анықтауға бағытталған. Зерттеудің негізгі мақсаты - саланың цифрлық трансформациясы үдерісінде туындайтын негізгі мәселелерді зерттеу және олардың тиімді шешімдер стратегияларын анықтау. Зерттеуде салыстырмалы талдау және сараптамалық бағалау әдістері қолданылып, республикадағы туризм саласының цифрландырылу деңгейінің дамыған елдермен салыстырғанда шектеулі екендігі, ауылдық жерлерде сапалы цифрлық инфрақұрылымның жоқтығы және туризм индустриясының қатысушыларының цифрлық сауаттылығының жеткіліксіздігі анықталды. Авторлар цифрлық технологиялардың туризм саласындағы ағымдағы жағдайына, олардың енгізілу жолындағы кедергілерге және олардың туризмнің дамуына әсерін бағалауға ерекше назар аударды. Бірнеше орталық аспектілер анықталды: инфрақұрылымдық мәселелер, білікті мамандардың жетіспеушілігі, киберқауіпсіздік және әртүрлі ақпарат түрлерін қорғау мәселелері, елдің заңнамалық базасын цифрландырудың жаңа басымдықтарына бейімдеу қажеттілігі. Авторлар жүргізген талдау цифрлық технологияларды туризмде тиімді пайдалану үшін тұтас ұлттық цифрлық стратегияны әзірлеудің және қаржы ресурстарымен қамтамасыз етудің маңыздылығын атап көрсетеді. Зерттеу нәтижелері мәселенің маңыздылығын растайды және авторлар инфрақұрылымды дамыту, цифрлық сауаттылық деңгейін арттыру және инвестицияларды ынталандыру бойынша іс-шараларды ұсынады.

Түйін сөздер: туризмді цифрландыру, цифрлық инфрақұрылым, цифрлық сауаттылық, туризмнің бәсекеге қабілеттілігі, ақпараттық жүйе, Қазақста.

Б.С. Шилибекова*[1], Р.В. Плохих[2]
[1]Алматы Менеджмент Университет, Алматы, Казахстан
[2]Казахский национальный университет имени аль-Фараби, Алматы, Казахстан

Оценка готовности и преодоление барьеров на пути цифровизации туризма: пример Казахстана

Аннотация. Данное исследование направлено на выявление проблем и наиболее актуальных вопросов в процессе цифровизации индустрии туризма в Республике Казахстан. Основная цель данного исследования – изучить главные проблемы, возникающие в процессе цифровой трансформации отрасли, и определить стратегии их эффективного решения. В исследовании использованы сравнительный анализ и экспертная оценка, чтобы выявить ограниченную цифровизацию туристской сферы республики по сравнению с более развитыми странами,

отсутствие качественной цифровой инфраструктуры в сельской местности и недостаточную степень цифровой грамотности участников индустрии туризма. Особое внимание авторы уделили рассмотрению текущего состояния цифровых технологий в туризме, раскрытию преград на пути их внедрения и оценке их влияния на развитие туризма. Идентифицированы несколько центральных аспектов: проблемы инфраструктурного типа, недостаток квалифицированных специалистов, проблемы кибербезопасности и защиты разного вида информации, потребность в адаптации законодательной базы страны к новым приоритетам цифровизации. Выполненный авторами анализ подчеркивает важность разработки целостной национальной цифровой стратегии и обеспечения финансовых ресурсов для эффективного использования цифровых технологий в туризме. Результаты исследования подтверждают значимость проблемы, и авторы предлагают мероприятия по развитию инфраструктуры, повышению уровня цифровой грамотности и стимулированию инвестиций.

Ключевые слова: цифровизация туризма, цифровая инфраструктура, цифровая грамотность, конкурентоспособность туризма, информационная система, Казахстан.

References

1. Werthner H., Klein S. Information technology and tourism – A challenging relationship (Springer-Verlag, Vienna, 1999, 343 p.).

2. Buhalis D. eTourism: Information Technology for Strategic Tourism Management (Financial Times Prentice Hall, Harlow, 2003, 376 p.).

3. Xiang Z., Gretzel U. Role of Social Media in Online Travel Information Search, Tourism Management, 31(2), 179-188 (2010).

4. Buhalis D., Sinarta Y. Real-time co-creation and nowness service: lessons from tourism and hospitality, Journal of Travel and Tourism Marketing, 36(5), 563-582 (2019).

5. Frolova E.A. Tendencii i problemy razvitija mirovogo turizma [Tendencies and problems of the world tourism development], Vestnik Universiteta [University Bulletin], 3, 61-65 (2019). [in Russian]

6. Koo C., Chang Ye. Guest editorial: new technologies for the tourism and hospitality industry, Industrial Management & Data Systems, 121(6), 1145-1151 (2021).

7. Li Z., Huo M., Huo T., Luo H. Digital tourism research: a bibliometric visualization review (2002–2023) and research agenda // Tourism Review. – 2024. – Vol. 79. – No. 2. – P. 273-289. doi: https://doi.org/10.1108/TR-03-2023-0176

8. Kumar S., Kumar V., Kumari Bhatt I., Kumar S., Attri K. Digital transformation in tourism sector: trends and future perspectives from a bibliometric-content analysis // Journal of hospitality and tourism insights. – 2024. – Vol. 7. – No. 3. – P. 1553-1576. doi: https://doi.org/10.1108/JHTI-10-2022-0472

9. Raji M.A., Olodo H.B., Oke T.T., Addy W.A., Ofodile O.C., Oyewole A.T. Digital marketing in tourism: a review of practices in the USA and Africa // International Journal of Applied Research in Social Sciences. – 2024. – Vol. 6. – No. 3. – P. 393-408. doi: https://doi.org/10.51594/ijarss.v6i3.896

10. Luo H., Wang H., Wu Y. Digital financial inclusion and tourism development // International Review of Economics & Finance. – 2024. – Vol. 90. – P. 207-219. doi: https://doi.org/10.1016/j.iref.2023.12.001

11. Chen W., Huang M. Improvement of transportation infrastructure, payment digitalization, and tourism consumption expenditure: analysis based on CHFS data // Finance Research Letters. – 2025. – 107000 (In Press, Journal Pre-proof). doi: https://doi.org/10.1016/j.frl.2025.107000

12. Mendieta-Aragón A., Rodríguez-Fernández L., Navío-Marco J. Tourism usage of digital collaborative economy platforms in Europe: situation, behaviours, and implications for the digital policies // Telecommunications Policy. – 2025. – Vol. 49. – No. 1. – P. 102874. doi: https://doi.org/10.1016/j.telpol.2024.102874

13. Ustinova N.G., Shevchenko M.V. Industrija gostepriimstva v jepohu cifrovizacii [The hospitality industry in the era of digitalization], Epoha nauki [Age of Science], 20, 453-457 (2019). [in Russian]

14. Bogomazova I.V., Anoprieva E.V., Klimova T.B. Cifrovaja jekonomika v industrii turizma i gostepriimstva: tendencii i perspektivy [Digital economy in the tourism and hospitality industry: trends and prospects], Servis v Rossii i za rubezhom [Service in Russia and abroad], 3(85), 34-47 (2019). [in Russian]

15. Ozimina L.A. Cifrovye kanaly i metody prodvizhenija kompleksnyh turistskih uslug [Digital channels and methods for promoting integrated tourism services], Izvestiya Sankt-Peterburgskogo gosudarstvennogo ekonomicheskogo universiteta [News of the St. Petersburg State Economic University], 2(116), 146-151 (2019). [in Russian]

16. Ob utverzhdenii Koncepcii cifrovoj transformacii, razvitiya otrasli informacionno-kommunikacionnyh tekhnologij i kiberbezopasnosti na 2023-2029 gody / Postanovlenie Pravitel'stva Respubliki Kazahstan ot 28.03.2023 goda No. 269 [On approval of the Concept of digital transformation, development of the information and communication technologies and cybersecurity industry for 2023-2029 / Decree of the Government of the Republic of Kazakhstan dated March 28, 2023 No. 269] [Electronic resource]. Available at: https://adilet.zan.kz/rus/docs/P2300000269 (accessed 01.09.2023). [in Russian]

17. Nurkatov A.A. Metodicheskoe sozdanie mehanizma povyshenija jeffektivnosti upravlenija regional'noj set'ju telekommunikacionnyh uslug [Methodological creation of a mechanism for increasing the efficiency of management of a regional network of telecommunication services], Peterburgskij jekonomicheskij zhurnal [St. Petersburg Economic Journal], 1, 197-205 (2019). [in Russian]

18. Regional'nyj statisticheskij ezhegodnik Kazahstana: Bureau of National Statistics of Agency for Strategic planning and reforms of the Republic of Kazakhstan [Regional statistical yearbook of Kazakhstan: Bureau of National Statistics of Agency for Strategic planning and reforms of the Republic of Kazakhstan] [Electronic resource]. Available at: https://stat.gov.kz/ru/publication/collections/?year=&name=21075&period= (accessed 25.05.2023). [in Russian]

19. Rjancev A.A., Gusakov M.A., Zamjatina M.F., Maksimov V.V., Smirnova G.P., Shabunina T.V., Shhelkina S.P. Metodologija issledovanija social'no-jekonomicheskih processov v nauchno-innovacionnoj sfere regiona: otchet o NIR 96-06-80066, Rossijskij fond fundamental'nyh issledovanij [Methodology for studying the social-economic processes in the scientific-innovative sphere of the region: research report 96-06-80066, Russian Foundation for Fundamental Researches] [Electronic resource]. Available at: https://elibrary.ru/download/elibrary_230104_44509103.htm (accessed 27.09.2023). [in Russian]

20. Shabunina T.V., Shhelkina S.P. Problemy informatizacii jekologo-jekonomicheskogo prostranstva regiona v kontekste innovacionnogo razvitija [Problems of informatization of the ecological-economic space of the region in the context of innovative development], Zhurnal pravovyh i jekonomicheskih issledovanij [Journal of Legal and Economic Researches], 1, 208-212 (2015). [in Russian]

21. Telecommunications Industry Outlook: 5G ushers in a new world of opportunities [Electronic resource]. Available at: https://www.readkong.com/page/2019-telecommunications-industry-outlook-3162681 (accessed 27.09.2023).

22. Ob utverzhdenii Prognoznoj skhemy territorial'no-prostranstvennogo razvitiya strany do 2030 goda / Ukaz Prezidenta Respubliki Kazahstan ot 09.10.2019 goda № 185 [On approval of the Forecast scheme for the territorial and spatial development of the country until 2030 / Decree of the President of the Republic of Kazakhstan dated October 9, 2019 No. 185] [Electronic resource]. Available at: https://adilet.zan.kz/rus/docs/U1900000185 (accessed 19.05.2023). [in Russian]

Information about authors:

Shilibekova B.S. – corresponding author, PhD, Researcher of the Graduate School of Business, Almaty Management University, Rozybakiyev str., 227, 050060, Almaty, Kazakhstan.

Plokhikh R.V. – Doctor of Sciences in Geography, Professor at the Recreation Geography and Tourism Department, Al-Farabi Kazakh National University, Al-Farabi Avenue, 71, 050040 Almaty, Kazakhstan,.

Сведения об авторах:

Шилибекова Б.С. – автор для корреспонденции, доктор PhD, исследователь Высшей Школы Бизнеса, Алматы Менеджмент Университет, ул. Розыбакиева, 227, 050060, Алматы, Казахстан.

Плохих Р.В. **–** доктор географических наук, профессор кафедры рекреационной географии и туризма, Казахский национальный университет имени аль-Фараби, проспект Аль-Фараби, 71, 050040, Алматы, Казахстан.

Авторлар туралы мәлімет:

Шилибекова Б.С. – хат-хабар авторы, PhD докторы, Жоғары Бизнес Мектебінің зерттеушісі, Алматы Менеджмент Университеті, Розыбакиев көшесі, 227, 050060, Алматы, Қазақстан.

Плохих Р.В. **–** география ғылымдарының докторы, рекреациялық география және туризм кафедрасының профессоры, Әл-Фараби атындағы Қазақ ұлттық университеті, Әл-Фараби даңғылы, 71, 050040, Алматы, Қазақстан.