

## ON THE PATH TO TOURISM DIGITALIZATION: THE DIGITAL ECOSYSTEM BY THE EXAMPLE OF KAZAKHSTAN

**Balzhhan SHILIBEKOVA\*** 

Almaty Management University, Graduate School of Business, Almaty, Kazakhstan, e-mail: b.shilibekova@almu.edu.kz

**Roman PLOKHIKH** 

Al-Farabi Kazakh National University, Faculty of Geography and Environmental Sciences, Department of Recreation Geography and Tourism, Almaty, Kazakhstan; University of International Business, Department of Tourism and Hospitality, Almaty, Kazakhstan, e-mail: plokhih.r@uib.kz

**Lóránt Dénes DÁVID\*** 

John von Neumann University, Faculty of Economics and Business, Department of Tourism and Hospitality, Kecskemét, Hungary;  
Hungarian University of Agriculture and Life Sciences (MATE), Institute of Rural Development and Sustainable Economy,  
Department of Sustainable Tourism, Gödöllő, Hungary; Eötvös Loránd University, Faculty of Social Sciences, Savaria University Centre,  
Savaria Department of Business Economics, Szombathely, Széchenyi István University, Győr, Hungary, email: david.lorant@gmail.com

---

**Citation:** Shilibekova, B., Plokhih, R., & Dávid, L.D. (2024). ON THE PATH TO TOURISM DIGITALIZATION: THE DIGITAL ECOSYSTEM BY THE EXAMPLE OF KAZAKHSTAN. *Geojournal of Tourism and Geosites*, 57(4spl), 2060–2070. <https://doi.org/10.30892/gtg.574spl20-1373>

---

**Abstract:** Global digitalization dramatically affects tourism actions, varying the principles of its organization, data support and the traveler himself. The main goal of the study is to analyze the digitalization process of the tourism industry at the current stage of development and its state in Kazakhstan. The article considers the issues related to the impact of electronic technology on the growth and progress of digitalization in tourism. An overview of examples for the tourism digital technologies is provided. Crucial new trends in the industry of tourism associated to digitalization are identified. The conducted research on the application of several scientific methods and technologies of information processing was based. In particular: bibliometric analysis in the field of tourism digitalization and digital ecosystems; study of Kazakhstan' tourist Internet portals; survey of representatives of Kazakhstan' travel agencies and modeling based on regression ordinal model. Bibliometric analysis was used to study the success level implementation of the activities in the field of tourism digitalization. This method was as a basis for identifying gaps, formed and future trends in the field of digital tourism ecosystem. The data source was the databases, which includes a wide range of publications on tourism scientific issues. The main analysis of articles was carried out in the special software Voyant Tools. Two additional research methods in this paper are applied: content analysis and modeling based on regression ordinal model. The current state of the market place in tourism, the level of application of elements of digital technologies in the sphere of tourism based on Kazakhstan' tourist platforms is evaluated. With the help of a survey it was analyzed the degree of penetration of digital technologies currently used by companies in the local tourism market.

**Keywords:** mountain tourism, digitalization, digital, transformation, information technology, circular economy digital ecosystem, Internet, Kazakhstan

\* \* \* \* \*

### INTRODUCTION

With the development of digital technology, tourism is becoming increasingly accessible and attractive to many people around the world (Baggio, 2022; El Archi et al., 2023). This is partly due to the widespread use of various technical gadgets, which have become an integral part of the daily lifestyle of modern people (Nautiyal et al., 2023). However, the main role in this process is played by the Internet, which provides travelers with a unique opportunity to study in advance the country or region they plan to visit (Gozgor et al., 2024). This helps them not only to assess the potential and limitations of their future travel, but also to make their choices more informed (Benaddi et al., 2024). In the context of developing countries and regions, tourism often becomes a key economic priority especially in the context of investment cooperation (Otarbayeva et al., 2024). Kazakhstan, with its huge potential in the tourism sector, is no exception. However, despite the richness of its nature and cultural heritage, the country still lags behind many other countries in the development of the tourism industry, as well as in the degree of utilization of digital technologies in this sphere (Alibekova and Bapiyeva, 2019; Shilibekova and Plokhih, 2024). Therefore, there is a need to improve the level of quality of tourism services in the country (Wendt, 2020). For this purpose, it is necessary to first assess the current level of digitalization of the tourism industry, then determine the barriers and prospects for growth of digitalization in this sphere and formulate further effective measures for its development. This is the relevance of studying this aspect of tourism in Kazakhstan. The main goal of the study is to analyze the digitalization process of the tourism industry at the current stage of development of Kazakhstan. For this, the following tasks were set: 1) to research the state of the digital tourism ecosystem in Kazakhstan and show how digital technologies are being introduced into various aspects of the tourism; 2) to identify key problems and digital

---

\* Corresponding author

solutions that contribute to the improvement of tourism services and their accessibility for local and international travelers; 3) to demonstrate the opportunities and challenges on the path of digitalization and improving the quality of service in the tourism sector. The study seeks to substantiate the importance of digitalization for Kazakhstan's tourism sector and its impact on the development and attractiveness of the country for tourists.

### LITERATURE REVIEW

Digital transformation is the main trend of economic development in the 21<sup>st</sup> century, presenting information to increase economic efficiency and improve the quality of life. It explains the requirement for tourism and hospitality companies to continuously improve the competitiveness of their products and services in the context of digital business (Busulwa et al., 2024; Santarsiero et al., 2024; Cardoso et al., 2024). The application of digital technologies contributes to increasing the speed of exchange, accessibility and security of information in tourism (Christou et al., 2023). One of the factors contributing to the digitalization of the tourism industry is the availability of the Internet. For the majority of the population, the Internet has become an accessible and primary source of obtaining, collecting and sharing information (Akarsu, 2025).

One final definition that is important to outline as the foundation of tourism business transformation is the notion of a digital ecosystem. It is an open, dynamic system of connecting people and organizations through technology and data that interact with each other to create and share value and meet each other's needs more efficiently and deeply. James F. Moore supports this thesis by stating that a digital ecosystem is a business network that uses digital technologies to create and deliver value to customers (Moore, 1993). The term "ecosystem" is borrowed from biological systems of interacting organisms placed in a habitat. This concept and terminology were first applied in scientific literature by James F. Moore (Moore, 1996). Later Marco Iansiti and Roy Levien (Iansiti and Levien, 2004), by analogy with the development of biological and economic systems, used this term to describe the interdependence of actors in the economy. Currently, a digital ecosystem can be defined as an interconnected and interdependent group of economic actors that share digital platforms for mutually beneficial purposes, such as commercial gain, innovation or common interests. Due to the synergistic effect of the interaction of companies united by an ecosystem, a new quality of products and services is formed based on the effect of complementarity. Ecosystems focus on the needs of the user, allowing them to receive different products and services through a single point of access within the ecosystem.

Some authors present arguments in favor of the assertion that the digital revolution is decisively changing the world. Sensors can connect devices such as thermostats, washing machines, televisions, laptops, tablets, and other objects to Internet of Things platforms. Industry 4.0 signals the end of established models and calls on scientists, managers, and citizens to observe new prisms and paradigms. Tourism actively participates in digital transformations, increasingly qualifying them as "Tourism 4.0" or "Smart Tourism". The author emphasizes that in the near future, tourist ecosystems will have to incorporate perspectives of smart tourism such as sustainability, circular economy, quality of life, and social value (Pencarelli, 2020).

The digitalization of tourism is an important trend that will develop in the coming years. Digital technology is changing the way people travel and making tourism more personalized, convenient, accessible and interactive. Famous author Michael Porter (Porter, 2008), who has made great contributions in the field of marketing competition studies adds that digitalization is not so much a matter of technology, but of the ability to create new business models and create competitive advantage. Digitalization itself is the process of converting information from analog to digital format, as well as the use of digital technologies for storing, processing, transmitting and displaying information. Of course, this also applies to the field of tourism. Another author Nicholas Carr (Carr, 2014) echoes what Michael Porter said, that digitalization is not just the automation of existing processes, but the possibility of creating new ways of doing business. Thus, digitalization is not useful in itself, but it is useful for transforming existing businesses and creating new businesses.

According to Ulrike Gretzel and Daniel Fesenmaier digital travel services allow tourists to plan and book their own trips, get information about attractions and itineraries, and share their experiences with other travelers. Digital services include a variety of online services and applications that enhance travelers' experiences (Gretzel and Fesenmaier, 2009). Some of the leading experts in this field, Dimitrios Buhalis and Aditya Amaranggana, point out that the development of digital travel services leads to personalization of travel offerings, improved service quality, and lower travel costs (Buhalis and Amaranggana, 2014). Some authors argue that mobile devices and applications have become indispensable tools for tourists. Despite their crucial role in tourism and continuous development, our understanding of their use and integration is limited. The authors analyzed and characterized 347 tourist mobile applications. The central attributes of the applications were identified through factor analysis, including tourist functionality, orientation and navigation, efficiency, effective mobility, and social activity (Birenboim et al., 2023). Marek Nowacki and Agnieszka Niezgoda conducted an analysis of TripAdvisor reviews to identify memorable hotel experiences. In their study, the authors employed quantitative methods such as text analysis, topic modeling, and sentiment analysis. The content analysis allowed them to identify six positive and two negative factors (Nowacki and Niezgoda, 2023). Spanish researchers in their study demonstrated the interrelationships between the use of traditional tour operators, online travel agencies such as Booking.com and Expedia, comparators, tour operators and traditional travel agencies, airlines, new non-tourism companies such as Google, and the use of sharing platforms for obtaining tourist information. They applied analysis to 13,243 tourists from 19 European countries for binomial logit analysis using the statistical analysis program SPSS (Almeida-Santana et al., 2020).

Some researchs emphasize that new digital technologies enable the creation of new services and business models, leading to constant changes in the digital tourism ecosystem. In the tourism sector, new players are entering and creating entirely new market segments, while existing players must rethink their business logic. The authors conducted a review of the value creation network of the European tourism ecosystem. By analyzing the business models and value creation flows

of 704 European enterprises based on Crunchbase data, they identified 27 roles and their interrelationships (Schaffer et al., 2021). Digitalization has increased the interdependence among stakeholders in tourism. The constantly changing environment and business requirements have intensified competition and collaboration among various organizations, leading to the emergence of the concept of the digital ecosystem. The authors emphasize the importance of the digital ecosystem in the tourism business. They construct a taxonomy of various tourism scenarios and a conceptual model of the digital tourism ecosystem. This work can serve as a reference and knowledge base for digital business system analysts, system designers, and digital tourism business implementation specialists for more effective design and implementation of digital business systems in the tourism sector (Shrestha et al., 2021). Tourism has undergone significant changes since information and communication technologies in all their forms began to permeate the industry and market. Researchers and practitioners have been drawn to a new concept – the digital ecosystem. It can be viewed as a technological infrastructure aimed at creating a digital environment to support and expand connections between businesses and stakeholders operating in the tourism sector. Rodolfo Baggio and Giacomo Del Chiappa attempted to assess the extent to which technological connectivity has influenced the structural configuration of the tourism system and tourist destinations. They note that when assessing relationships between stakeholders within a tourist destination, two components can be considered: the real and the virtual. The researchers demonstrated how these two components are structurally interconnected and simultaneously evolving, forming a unified system (Baggio and Chiappa, 2014). Thus, all the above authors argue the value of digitalization, digital ecosystems and digital services in terms not of the digital technologies themselves, but of the opportunity to create new businesses, to create a competitive advantage by better meeting the needs of consumers, tourists and travelers. The presented facts and analysis of scientific publications allowed us to identify several major trends (Figure 1).

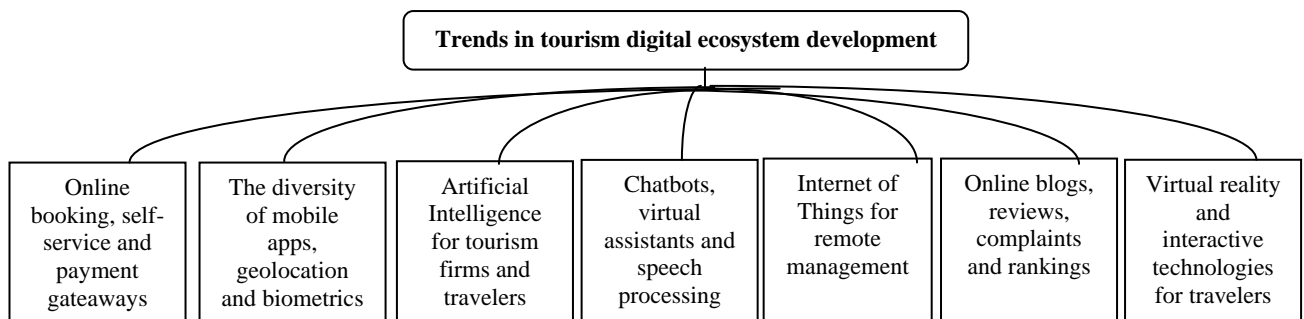


Figure 1. Several major trends in tourism digital ecosystem development (Source: Authors)

Online booking, self-service and payment gateways are becoming increasingly popular in the tourism industry (Rodrigues et al., 2024; Meier et al., 2025). Consumers increasingly prefer online booking of hotels, airline tickets, tours and other services, leading to the growth of online platforms and self-service systems (Wibowo et al., 2021; Yanis et al., 2023; Abdirazakov et al., 2023). The indispensability for tourists of mobile devices is caused by the increasing diversity of mobile apps, geolocation, biometrics and other technologies of this type (Ying et al., 2024). Smartphone applications allow customers to access information, make payments, book hotel rooms, select tours and guides, translate from any language into their native language and many other useful functions that make the life of a modern traveller much easier (Williams et al., 2020; Gbuová et al., 2024). Thus, while travelling, there is no need to communicate directly with anyone in the traditional way (Mikhaylova et al., 2021; Sun et al., 2022).

Artificial Intelligence is finding more and more niches for application for tourism firms and travelers (Solakis et al., 2024). The application of artificial intelligence, particularly recognition technology, provides added convenience and enhances the safety of hotel stays around the world (Dwivedi et al., 2024). Analytics and artificial intelligence systems allow travel companies to create personalized offers and recommendations based on customer preferences and behavior (Suanpang and Pothipassa, 2024). Putting this into practice allows room access to be granted via retina scanning or fingerprint scanning. Facial recognition technology can improve the customer experience by personalizing services. An important trend in the tourism industry is the use of chatbots, virtual assistants and speech processing. Chatbot is a computer-generated program that can be defined as a tool that allows people to communicate interactively using pre-programmed artificial intelligence (Benaddi et al., 2024). Chatbots fall into two categories based on how they interact with people: auditory (voice) and text, and the use of these chatbots is becoming increasingly popular on travel websites. The advantage of a chatbot or online assistant is that it works 24 hours a day and is ready to respond to a wide variety of queries from people (Majid et al., 2024; Mandić et al., 2024).

Internet of Things for remote management. This technology allows companies to better and more quickly meet the needs of their customers (Rosário and Dias, 2024). For example, this technology allows travelers to remotely set the temperature in their room, order room service and other services from their smartphone, without directly communicating with hotel staff. This technology also reduces staff workload, and therefore reduces staffing costs (Mathew et al., 2024; Ma, 2024).

Online blogs, reviews, complaints and rankings have been developed as elements of the digital ecosystem of tourism and important trends (Chen et al., 2025; Bulchand-Gidumal and Melián-González, 2024). To allow customers to quickly and easily share their opinions online, especially on social media platforms developed for the travel industry such as Booking, Airbnb, TripAdvisor or on travel websites, it will help accommodation agencies and travel service providers to gain a deeper understanding of travelers' needs (Wan and Forey, 2024; Robertson et al., 2024).

Virtual reality and interactive technologies are revolutionizing the travel industry, offering travelers extraordinary, comfortable and highly engaging ways to explore destinations and attractions, planning trips and navigate in real time (Any et al., 2024). Virtual and augmented reality provides consumers with the opportunity to explore places and attractions before traveling, making travel more informative and interesting, thus providing the necessary information to help travelers better understand the destination (Sousa et al., 2024; Phoong et al., 2024). Some tourist attractions and hotels utilize interactive technologies such as touch screens, interactive maps, and smart devices to enhance the visitor experience.

All the noted trends are reflected in the tourism and hospitality sector of Kazakhstan, but their manifestations are still very small. This is explained by the initial level of tourism industry's development, as evidenced by the country's place in the Travel and Tourism Development Index (TTDI). In the most recent version of the TTDI for 2021, Kazakhstan ranked 66th out of 117 countries. The index is based on 17 criteria. If we compare the position of Kazakhstan compared to other former countries that were part of the Soviet Union, Kazakhstan lags behind such countries as Estonia (29), Lithuania (42), Georgia (44), Latvia (48), Armenia (61), Azerbaijan (63), but ahead of such countries as Moldova (77), Kyrgyz Republic (90), Tajikistan (92). Thus, Kazakhstan is still at the bottom of the ranking, relative to its middle (TTDI, 2022).

In 2023, Kazakhstan reached inbound tourism figures that could be observed before the crisis caused by the COVID-19 pandemic. The country was visited by 9.2 million guests from abroad. This is the highest figure since 2019, when 8.5 million foreigners came to the country. However, of the 9.2 million visitors, only 1.1 million stayed in hotels, hostels, campgrounds, resorts and vacation homes. This is only about 12% of the total amount. The remaining 8.1 million people either rented apartments or houses for rent or stayed with relatives and acquaintances. Of those who stayed in hotels, only less than half – 523,000 people – visited the country for any personal purposes unrelated to professional activities. The rest of foreign visitors came to the Republic of Kazakhstan simply on business. The majority of tourists are CIS citizens (Shaimardanov, 2022). The Ministry of Tourism and Sports of the Republic of Kazakhstan reports an increase in the number of hotels, rest houses, sanatoriums, but also recognizes that the country is characterized by insufficient development of infrastructure in places of tourist attraction, poor logistics, limited number of accommodations, low quality of the offered tourist products, high prices for air tickets, high degree of moral and physical deterioration of accommodation facilities (Shevyakova et al., 2019; Issakov et al., 2022; Issakov et al., 2023). However, the state represented by the Ministry of Tourism and Sports is making efforts to develop the tourism industry of Kazakhstan. In 2023, the Ministry of Tourism and Sports developed the next, third concept for development of the tourism industry in the Republic of Kazakhstan until 2029 Government of the Republic of Kazakhstan, 2023). As measures to stimulate the growth of tourist flows to entrepreneurs, the state support provides reimbursement of part of the costs in several areas: construction and reconstruction of tourist facilities, roadside service facilities, maintenance of hygienic sanitary facilities, purchase of tourist class transport or ski equipment. Subsidies to tour operators for each imported tourist and free flights for children under the Kids Go Free program are also provided (Tleuberdinova et al., 2024; Akbar et al., 2024).

In the area of digitalization of the tourism industry, the Ministry of Tourism and Sports recognizes that Kazakhstan is characterized by such problems related to the creation of a convenient information environment for tourists as: low level of integration of modern tourism technologies and low level of digitization; weak level of awareness and knowledge about real tourist facilities and recreational opportunities in the country; lack of a holistic tourism product from all available tourism segments (each operates in isolation); lack of Internet infrastructure, as well as poor Internet access in remote regions, including along tourist routes in the territory of the special natural protected areas. Nevertheless, the state is working on the digitalization of the tourism industry (Rakhmetova et al., 2024; Adai et al., 2024). In 2017, the JSC "National Company "Kazakh Tourism"" was founded to promote Kazakhstan globally as a tourist destination. Several online platforms have been created, the content analysis of which is given below. These platforms are interconnected by cross-referencing each other's resources. For example, for the convenience of foreign tourists the platform "eQonaq" was created, which offers the service of using a QR code when crossing the border to apply for a visa, which eliminates the human factor. The data of a foreign tourist are automatically sent to the migration service of the country. It can also be used to find guides, hotels, apartments, find out the cost of cab fares, buy a SIM card and much more.

## MATERIALS AND METHODS

The research conducted on the application of several scientific methods and technologies of information processing was based. In particular: bibliometric analysis in the field of tourism digitalization and digital ecosystems; study of Kazakhstan' tourist Internet portals; survey of representatives of Kazakhstan' travel agencies and modeling based on regression ordinal model (Figure 2). Bibliometric analysis was used to study the success level implementation of the activities in the field of tourism digitalization. This method as a basis for identifying gaps, formed and future trends in the field of digital tourism ecosystem can be useful (Ng et al., 2022; Roziqin et al., 2023; Ogutu et al., 2023; Rahmat et al., 2024). The data sources were the Scopus and Web of Science databases, which include a wide range of publications on tourism scientific issues. A search by title, abstract and keywords as of April 20, 2024 was used. As a result, key terms and their definitions such as digitalization, digital ecosystem, digital services and others were identified.

Content analysis as a method of qualitative and quantitative study of the content of articles on the topic under study was used. The application of this method involves searching for certain words in the articles, their interrelation, classification, their subsequent counting and quantitative and visual presentation of the results. Preliminary texts of articles should be lemmatized and cleaned from stop words. Then it is necessary to count the number of keywords and stable word combinations. The frequency of occurring words is visualized in the form of a word cloud. The visually larger the size of a word, the more often it was mentioned in the articles. Next, the relationship between the detected keywords is analyzed.

Words that are related to each other are connected using lines. The thicker the line connecting the words, the stronger the connection between these words. Search of scientific articles in Scopus and Web of Science databases on the phrases “digital tourism” + Kazakhstan or “digitalization tourism” + Kazakhstan did not give good results, which indicates the low degree of study of this topic in the scientific environment of the country. Therefore, the main search for articles on these word combinations was carried out in the special software Voyant Tools webapp and Google search engine by Kazakh, Russian and English with translation of final results into English. Based on the found articles the content analysis was carried out in order to understand what keywords were most often encountered in them and what connection is there between them.

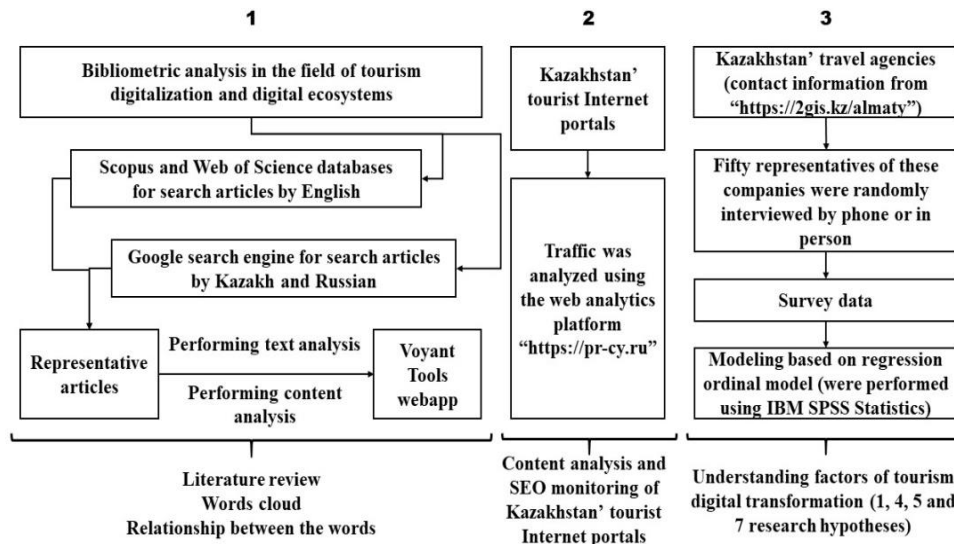


Figure 2. Methodological background of research (Source: Authors)

In Kazakhstan, attempts are being made to create tourist portals that accumulate information about events, routes, places and everything else that a tourist may need. Such Internet platforms were created on the initiative of the state. As part of the content analysis, several such tourist portals were analyzed for the usefulness, diversity and relevance of the information they contain. The traffic to these sites was analyzed using the web analytics platform “https://pr-cy.ru” as of March, 2024. The results of this analysis are presented in the form of a comparative table in the section on content analysis.

The next method of analysis was to conduct modeling using ordinal regression based on the survey data. Since the questions in the questionnaire belong to the ordinal scale and are measured on a Likert scale from 1 to 5, it was decided to use ordinal regression. In order to determine the impact of digitalization of tourism companies’ business on their activities, a survey of owners and managers of travel agencies operating in the market of Almaty, the largest metropolitan area of the country, was conducted. To assess the general population of travel agencies, the directory of organizations “https://2gis.kz/almaty” was used. On the request “Travel agencies”, the electronic directory found 762 companies, with addresses, phone numbers and websites. Fifty representatives of these companies were randomly interviewed by phone or in person. Survey data processing and model building were performed using IBM SPSS Statistics (Statistical Package for the Social Sciences) program, version 27. Respondents were asked various questions regarding the degree of digitalization of their business and their attitude to digital transformation. Thus, the survey participants were asked the question “What digitalization tools have already been implemented in the company”. Each implemented digitalization tool was given 1 point, in total the company could score from 0 to 10 points. The scores were further divided into 5 groups on a Likert scale: 1) 0-2 points; 2) 3-4 points; 3) 5-6 points; 4) 7-8 points and 5) 9 or more points. Thus, a rating of digitalization of travel agencies was compiled, which was further applied in the regression model as the dependent variable.

Based on the formulated factors that may influence the degree of digitalization of travel agency business, 7 research hypotheses were identified, which will be further tested using regression analysis.

**H1:** Respondents’ agreement that social media and online advertising play an important role in attracting attention to our tour packages, leads to a high degree of digitalization of travel agency business.

**H2:** Respondents’ agreement that online reviews have a significant impact on our agency reputation, leads to a high degree of digitalization of travel agency business.

**H3:** Respondents’ agreement that mobile apps provide additional opportunities to interact with customers.

**H4:** Respondents agree that pressure from competitors, including online travel agencies and new players in the market, are forcing us to adopt digitalization tools to attract customers and leads to a high degree of digitalization of travel agency business.

**H5:** Respondents agree that partnerships with foreign tour operators encourage faster and more effective implementation of new digital solutions and lead to a high degree of digitalization of travel agency business.

**H6:** Respondents agree that consumer demand, increasing consumer preference for online booking, mobile apps and convenient digital services drives the degree of digitalization of our business and leads to a high degree of digitalization of travel agency business.

**H7:** Respondents’ agreement that economic factors such as costs of digitalization, availability of funding and expectations of return on investment influence the degree of digitalization of travel agency business.

**RESULTS AND DISCUSSION**

The text analysis of scientific articles revealed that the most frequently used words were: online booking (52), cashless payments (48), mobile applications (39), mobile check-in (33) and other words and phrases as shown in the word cloud below. The numbers in brackets show the number of uses of the words (Figure 3). Figure 4 shows the relationship between the words.



Figure 3. Words cloud (Source: based on Authors’ text analysis)

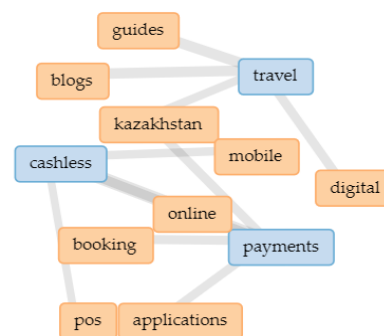


Figure 4. Keyword relationships (Source: Authors)

Table 1. Results of content analysis and SEO monitoring of online travel platforms

Criteria	Websites						
	https://kazakhstan.travel	https://eqonak.kz	https://tourismkaz.kz	https://kaztour-association.com	https://qaztourism.kz	https://www.tourisonline.kz	https://tourstat.kz
About the project	Promotion of Kazakhstani tourism products	The system of collection and accounting of tourist flow and migration control, registration of foreigners	Promotion of Kazakhstani tourism products	The Association was founded in May 1999 with the support of the President of the Kazakhstan	JSC “National Company “Kazakh Tourism”” was founded in 2017	Promotion of Kazakhstani tourism products	Provides government statistics on tourist flows
Number of supported languages	7	3	3	3	3	2	3
Contact details	1	1	1	1	1	1	1
Relevance of news, date of last news posting	21.06.2023	23.03.2024	04.04.2024	04.04.2024	12.03.2024	15.03.2024	28.02.2022
Photo materials	1	1	1		1		
Videos	1	1	1		1		
Regional information	1		1		1		
Routes, maps, sights	1	1	1		1	1	
3D tours	1	1	1				
Catalog of accommodation (hotels, guest houses, apartments)	1	1	1	1		1	
Register of travel agents, tour operators, tour guides, tour guides, tour guides, guides- interpreters	1			1		1	1
Weather information	1	1	1	1			
Exchange rate information	1	1					
Virtual assistant, online chat with support	1					1	
Number of social media accounts	5		2	4	3		
Smartphone app		1	1				
Regulatory framework on tourism, legal support for tourists	1	1		1		1	
Tourism training courses				1		1	
Geography, offline offices				4			
Attendance in March 2024, thousand times	71,7	36,2	8,6	6,9	5,7	4,7	1
Position in the country by traffic	12 079	9 598	106 814	29 513	46 045	38 297	
Country leader in terms of attendance	Kazakhstan: 19%	Kazakhstan: 97%	Vietnam: 12%	Vietnam: 13%	Kazakhstan: 8%	Kazakhstan: 22%	Kazakhstan : 100%

Notes: based on Authors’ content analysis and SEO Monitoring Platform (“https://pr-cy.ru”, March, 2024)

It can be seen that there is a relationship between the words “cashless”, “online” and “payments”; “travel”, “blogs”, “digital” and “guides”. In addition to the analysis of articles on the topic of tourism digitalization in Kazakhstan, a content analysis of 7 specialized Kazakhstan’s Internet resources was conducted. The purpose is to promote Kazakhstan’s tourism products, that is, their content and filling with various information related to the development of tourism in the country. These resources are sorted by the number of visits in March 2024 (Table 1).

In general, we can conclude that these sites are not very popular and do not occupy high places in terms of attendance and traffic. Filling these resources with interesting content leaves much to be desired. Often these sites duplicate information and link to each other, because they are created by order of the state. It can be concluded that for the real digital transformation of the country’s tourism sphere it is necessary not to have a formal approach on the part of the state, but a more free approach based on competition, market freedom and involvement of foreign management, including by attracting foreign investment in the country’s tourism sphere. Within the framework of the survey conducted among tourism companies of Almaty city the question “What do you think, what key problems hinder the successful realization of the digital transformation project in your company?” was asked, the respondents agreed that the main problems are: “lack of financial resources” (38%); “lack of experienced ICT specialists” (26%); and “resistance (or lack of experience) of staff” (18%) (Figure 5).

After finding out the barriers that are encountered in the way of digitalization of business in travel agencies, an open question was asked about what needs to be done to make digital transformation projects more actively implemented in travel agencies. The following answers were given by travel agency representatives: affordability; government support; development of technological infrastructure; staff training; knowledge management in the company; popularization of digitalization; management’s awareness and willingness to realize digital transformation. Figure 6 shows the distribution of digital tools that travel companies have already implemented in their activities at the time of the survey. Most of all, companies have implemented electronic communication systems between employees – 15.2%, followed by electronic document management systems – 13.6% and POS-terminals for cashless payment – 12.1%. To the smallest extent, companies have implemented the use of blockchain and digital tourist passport in their work – 3% and 4.5% respectively (Figure 6).

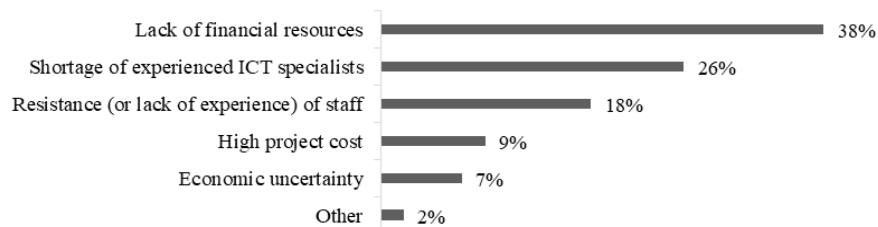


Figure 5. Key challenges hindering digital transformation in the company (Source: Authors)

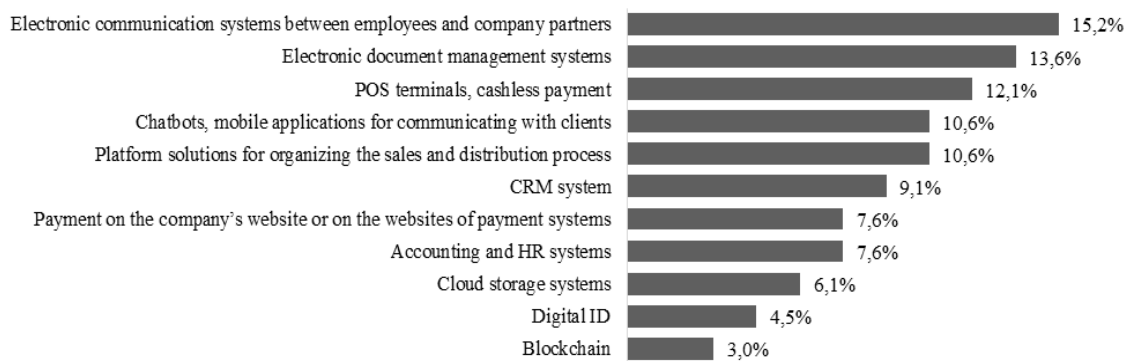


Figure 6. Digitalization tools implemented in the company (Source: based on survey data conducted by the Authors)

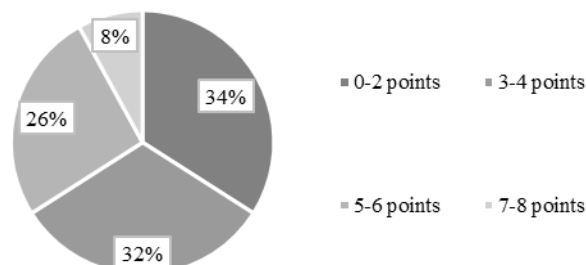


Figure 7. Digitalization tools implemented in the company (Source: based on survey data conducted by the Authors)

Figure 7 shows the percentage distribution of travel companies according to the calculated ranking, which is based on the total number of digitalization tools applied. According to this graph, there are no companies that have implemented 9 or more digitalization tools in their work. The largest groups are companies that have implemented only up to 2 tools (34%) or up to 4 tools (32%) of digitalization in their work. As independent variables, the model included the following statements, which were offered to be evaluated on a Likert scale from 1 to 5, where 1 meant the minimum

significance of the factor’s impact on increasing the degree of digitalization of the company’s activities, and 5 meant the maximum significance of the factor. The list of such factors is given below.

1. Social media and online advertising play an important role in attracting attention to our tour packages.
2. Online reviews have a significant impact on our agency’s reputation.
3. Mobile apps provide additional opportunities to interact with customers.
4. Pressure from competitors, including online travel agencies and new players in the market are forcing us to adopt digitalization tools to engage customers.
5. Partnerships with foreign tour operators encourage faster and more efficient implementation of new digital solutions.
6. Consumer demand, increasing consumer preference for online booking, mobile apps and convenient digital services are driving the degree of digitalization of our business.
7. Economic factors such as the cost of digitalization, the availability of financing and expectations of return on investment influence the degree of digitalization of our company.

An ordinal regression model was created on the basis of these statements. As a result, 4 factors out of 7 showed statistically significant influence on the dependent variable. These variables, their coefficients and their significance level are presented in Table 2. According to the selected factors, it is possible to understand what factors drive the development of digital transformation of travel agency business. And thanks to the coefficients of the obtained ordinal regression, it is possible to calculate the probability of the degree of digitalization of travel agency.

Table 2. Factors of the ordinal regression model (Notes: based on survey data conducted by the Authors)

Factors	Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval		
						Lower Bound	Upper Bound	
Threshold	[Digitalization = 1]	65.418	14.868	19.361	1	.000	36.278	94.558
	[Digitalization = 2]	68.792	15.138	20.650	1	.000	39.121	98.463
	[Digitalization = 3]	72.887	15.547	21.980	1	.000	42.417	103.358
Location	[Consumer_demand=1]	32.541	6.011	29.306	1	.000	20.760	44.323
	[Consumer_demand=2]	27.096	4.945	30.029	1	.000	17.404	36.787
	[Consumer_demand=3]	26.031	5.259	24.497	1	.000	15.723	36.339
	[Consumer_demand=4]	27.688	5.157	28.827	1	.000	17.581	37.796
	[Consumer_demand=5]	0 <sup>a</sup>	.	.	0	.	.	.
	[Partnerships=1]	26.478	5.693	21.633	1	.000	15.320	37.635
	[Partnerships=2]	31.144	6.346	24.086	1	.000	18.706	43.582
	[Partnerships=3]	31.197	6.325	24.327	1	.000	18.800	43.593
	[Partnerships=4]	29.296	6.147	22.711	1	.000	17.247	41.344
	[Partnerships=5]	0 <sup>a</sup>	.	.	0	.	.	.
	[Social_media=1]	23.756	5.038	22.238	1	.000	13.882	33.629
	[Social_media=2]	5.595	2.334	5.747	1	.017	1.020	10.169
	[Social_media=3]	6.522	2.215	8.668	1	.003	2.180	10.863
	[Social_media=4]	1.833	2.049	.800	1	.371	-2.183	5.849
	[Social_media=5]	0 <sup>a</sup>	.	.	0	.	.	.
	[Competition=1]	27.780	5.452	25.961	1	.000	17.094	38.467
	[Competition=2]	3.905	2.205	3.136	1	.077	-.417	8.226
	[Competition=3]	3.765	2.015	3.490	1	.062	-.185	7.716
	[Competition=4]	1.888	1.739	1.179	1	.278	-1.521	5.296
	[Competition=5]	0 <sup>a</sup>	.	.	0	.	.	.
	[Mobile_apps=1]	1.819	3.670	.246	1	.620	-5.373	9.012
	[Mobile_apps=2]	4.898	3.395	2.081	1	.149	-1.757	11.552
	[Mobile_apps=3]	5.266	3.385	2.421	1	.120	-1.368	11.900
	[Mobile_apps=4]	-14.045	.000	.	1	.	-14.045	-14.045
	[Mobile_apps=5]	0 <sup>a</sup>	.	.	0	.	.	.
	[Economic_factors=1]	-3.835	2.737	1.962	1	.161	-9.200	1.531
	[Economic_factors=2]	-2.425	2.939	.681	1	.409	-8.186	3.335
	[Economic_factors=3]	2.747	2.800	.963	1	.326	-2.740	8.235
	[Economic_factors=4]	-2.392	2.986	.642	1	.423	-8.244	3.460
	[Economic_factors=5]	0 <sup>a</sup>	.	.	0	.	.	.
[Online_reviews=1]	-3.703	2.050	3.264	1	.071	-7.721	.314	
[Online_reviews=2]	-.315	2.160	.021	1	.884	-4.549	3.919	
[Online_reviews=3]	.578	2.063	.078	1	.779	-3.465	4.621	
[Online_reviews=4]	0 <sup>a</sup>	.	.	0	.	.	.	

Link function: Logit; a. This parameter is set to zero because it is redundant

Thus, the results of ordinal regression confirmed the 1, 4, 5 and 7 research hypotheses, namely:

**H1:** Respondents’ agreement that social media and online advertising play an important role in attracting attention to our tour packages leads to a high degree of digitalization of travel agency business.

**H4:** Respondents agree that pressure from competitors including online travel agencies and new players in the market are forcing us to adopt digitalization tools to attract customers and leads to a high degree of digitalization of travel agency business.



**H5:** Respondents agree that partnerships with foreign tour operators encourage faster and more efficient implementation of new digital solutions and leads to a high degree of digitalization of travel agencies' business.

**H6:** Respondents agree that consumer demand, increasing consumer preference for online booking, mobile apps and convenient digital services drive the degree of digitalization of our business and lead to a high degree of digitalization of travel agency business.

## CONCLUSIONS

According to the results of the analysis of articles describing the process of digitalization of the tourism industry in Kazakhstan, it can be concluded that Kazakhstan is in direct need of development of its tourism industry, which is currently lagging behind leader countries of the world. The domestic tourism industry has a number of serious problems, the solution of which requires modernization, large investments and support from the state, not only in the form of cash injections, but also incentives in the form of tax breaks and preferences for potential investors, preferential financing of strategic projects, assistance in solving land, infrastructure and other issues, as well as improving information digital systems. The competition between countries for tourists' money in the world is very fierce and Kazakhstan has a long way to go for several decades. At present, it can be noted that Internet platforms created on the initiative of the state do not reach the level of similar sites of foreign countries and they should and can be improved. Tourism companies themselves are well aware of the importance of digital transformation of their business and have such a need, which is driven by consumer demand, fierce competition with local and foreign competitors, and the requirements of foreign partners.

However, they experience a number of difficulties with deeper implementation of digital technologies in their activities, which are caused by problems with financing, shortage of qualified personnel and knowledge. Respondents' agree that social media and online advertising play an important role in attracting attention to our tour packages leads to a high degree of digitalization of travel agency business. They marked that pressure from competitors including online travel agencies and new players in the market are forcing to adopt digitalization tools to attract customers and leads to a high degree of digitalization of travel agency business. Partnerships with foreign tour operators encourage faster and more efficient implementation of new digital solutions and leads to a high degree of digitalization of travel agencies' business.

Consumer demand, increasing consumer preference for online booking, mobile apps and convenient digital services drive the degree of digitalization of business and lead to a high degree of digitalization of travel agency business. In turn, the state could also assist travel agencies in addressing these issues. In general, it can be concluded that it is advisable to create a digital ecosystem of tourism on the terms of public-private partnership, taking into account the interests of both commercial entities and the state, as well as citizens traveling and residing in tourist destinations.

For this purpose, it is necessary to achieve coordinated cooperation and integration of interests of public organizations, private companies and self-governments, as well as local representatives of government structures and communities. This will make it possible to stimulate and control common participation at various stages of tourist destination development. Only in this case we can talk about creating the prerequisites for a deep digital transformation of the entire tourism industry of the country for the effective development of tourism at the international, national and regional levels.

**Author Contributions:** Conceptualization, B.Sh. and R.P.; methodology, B.Sh. and R.P.; software, B.Sh.; validation, B.Sh. and R.P.; formal analysis, B.Sh. and L.D.D.; investigation, B.Sh. and R.P.; data curation, B.Sh. and R.P.; writing, B.Sh., R.P. and L.D.D.; visualization, B.Sh., R.P. and L.D.D.; supervision, R.P.; project administration, B.Sh. All authors have read and agreed to the published version of the manuscript.

**Funding:** Project of the IRN 19175225 "Conceptual model development of digital ecosystem for the Kazakhstan tourism industry and its forced development" in frameworks of young scientist grant financing for 2023-2025, the source of financing is the Ministry of Science and Higher Education of Kazakhstan.

**Institutional Review Board Statement:** Not applicable.

**Informed Consent Statement:** Not applicable.

**Data Availability Statement:** The study was limited to documents that have been posted on the Internet for the last 20 years. A bibliometric review was used to identify key concepts, but has limitations Presented data can be obtained on request from the corresponding author, B.Sh..

**Acknowledgements:** The article undertaken was made possible by the Ministry of Science and Higher Education of the Kazakhstan and the equal involvement of authors concerned. This work was supported by the Flagship Research Groups Programme of the Hungarian University of Agriculture and Life Sciences (MATE).

**Conflicts of Interest:** The authors declare no conflict of interest.

## REFERENCES

- Abdirazakov, N. M., Kushebayev, Z. T., Numanova, F. A., Orynbet, P. Z., & Myltykbayeva, G. E. (2023). Understanding the relationships between hotel variables in Almaty, Kazakhstan: an investigation using booking.com data. *Bulletin of the Karaganda university Economy series*, 112(4), 7-18. <https://doi.org/10.31489/2023ec4/7-18>
- Adai, A., Mazbayev, O., Tleubaeva, A., Amangeldi, A., & Khan, F. (2024). The Kazakhstan tourism market structure analysis and optimization path selection. *Journal of Geography and Environmental Management*, 72(1). <https://doi.org/10.26577/JGEM.2024.v72.i1.011>
- Akarsu, G. (2025). *Tourism, Internet Usage, and Safety*. In *Encyclopedia of Information Science and Technology*, Sixth Edition. IGI Global, 1-23 p.

- Akbar, I., Tazhekova, A., Myrzaliyeva, Z., Pazylkhaiyr, B., & Mominov, S. (2024). Positive Outcomes of Cross-Border Tourism Development Cooperation: A Case of Kazakhstan, Kyrgyzstan and Uzbekistan. *REGION*, 11(2), 43-62. <https://doi.org/10.18335/region.v11i2.494>
- Alibekova, G., & Bapiyeva, M. (2019). Digitalization processes and their impact on the development of the Republic of Kazakhstan. *Bulletin of National Academy of Sciences of the Republic of Kazakhstan*, 4(380), 217-225. <https://doi.org/10.32014/2019.2518-1467.113>
- Almeida-Santana, A., David-Negre, T., & Moreno-Gil (2020). New digital tourism ecosystem: understanding the relationship between information sources and sharing economy platforms. *International Journal of Tourism Cities*, 6(2), 335-345. <https://doi.org/10.1108/IJTC-09-2019-0173>
- Any, B., Four, S., & Tariazel, C. (2024). Technology integration in tourism management: Enhancing the visitor experience. *Startuprenew Business Digital (SABDA Journal)*, 3(1), 81-88. <https://doi.org/10.33050/sabda.v3i1.508>
- Baggio, R. (2022). *Digital ecosystems, complexity, and tourism networks*. In: Xiang Z, Fuchs M, Gretzel U, Höpken W (eds). Handbook of e-tourism. Springer, Cham, 1545-1564 p.
- Baggio, R., & Chiappa, G. D. (2014). Real and virtual relationships in tourism digital ecosystems. *Information Technology and Tourism*, 14, 3-19. <https://doi.org/10.1007/s40558-013-0001-5>
- Benaddi, L., Ouaddi, C., Jakimi, A., & Ouchao, B. (2024). A systematic review of chatbots: classification, development, and their impact on tourism. *IEEE Access*, 12, 78799-78810. <https://doi.org/10.1109/ACCESS.2024.3408108>
- Benaddi, L., Ouaddi, C., Jakimi, A., & Ouchao, B. (2024). Towards a software factory for developing the chatbots in smart tourism mobile applications. *Procedia Computer Science*, 231, 275-280. <https://doi.org/10.1016/j.procs.2023.12.203>
- Birenboim, A., Bulis, Y., & Omer, I. (2023). A typology of tourism mobility apps. *Tourism Management Perspectives*, 48, 101161. <https://doi.org/10.1016/j.tmp.2023.101161>
- Buhalis, D., & Amaranggana, A. (2014). Smart tourism destinations, IFITT, Dublin, Ireland, 553-564 p.
- Bulchand-Gidumal, J., & Melián-González, S. (2024). Fighting fake reviews with blockchain-enabled consumer-generated reviews. *Current issues in tourism*, 27(5), 739-753. <https://doi.org/10.1080/13683500.2023.2173054>
- Busulwa, R., Pickering, M., & Pathirana, N. W. (2024). Readiness of hospitality and tourism curricula for digital transformation. *Journal of Hospitality, Leisure, Sport & Tourism Education*, 35, 100519. <https://doi.org/10.1016/j.jhlste.2024.100519>
- Cardoso, R. C., Sohn, A. P. L., Ferraso, M., & Júnior, S. P. (2024). Open innovation in the tourism field: A systematic literature review. *Journal of Open Innovation: Technology, Market, and Complexity*, 10, 100359. <https://doi.org/10.1016/j.joitmc.2024.100359>
- Carr, N. (2014). *The Glass Cage: Automation and Its Enemies*, W.W. Norton and Company, New York, USA, 288 p.
- Chen, J., Wu, J., Wang, D., & Stantic, B. (2025). Beyond static rankings: A tourist experience-driven approach to measure destination competitiveness. *Tourism Management*, 106, 105022. <https://doi.org/10.1016/j.tourman.2024.105022>
- Christou, P., Hadjielias, E., Simillidou, A., & Kvasova, O. (2023). The use of intelligent automation as a form of digital transformation in tourism: Towards a hybrid experiential offering. *Journal of Business Research*, 155, 113415. <https://doi.org/10.1016/j.jbusres.2022.113415>
- Dwivedi, Y. K., Pandey, N., Currie, W., & Micu, A. (2024). Leveraging ChatGPT and other generative artificial intelligence (AI)-based applications in the hospitality and tourism industry: practices, challenges and research agenda. *International Journal of Contemporary Hospitality Management*, 36(1), 1-12. <https://doi.org/10.1108/IJCHM-05-2023-0686>
- El Archi, Y., Benbba, B., Zhu, K., El Andaloussi, Z., Pataki, L., & Dávid, L. D. (2023). Mapping the Nexus between Sustainability and Digitalization in Tourist Destinations: A Bibliometric Analysis. *Sustainability*, 15(12), Paper: 9717, 1-16. <https://doi.org/10.3390/su15129717>
- Gburowa, J., Lukáč, M., & Matušíková, D. (2024). Impact of digital tools on the interest in visiting heritage objects in tourism. *GeoJournal of Tourism and Geosites*, 53(2), 622-629. <https://doi.org/10.30892/gtg.53225-1237>
- Government of the Republic of Kazakhstan (2023). *Ob utverzhdenii Konceptii razvitiya turistskoj otrasli Respubliki Kazahstan na 2023-2029 gody [On approval of the Concept for the development of the tourism industry of the Republic of Kazakhstan for 2023-2029]*. <https://adilet.zan.kz/rus/docs/P2300000262>
- Gozgor, G., Lau, C. K., Lin, Z., & Zeng, Y. (2024). The impact of digital governance on tourism development. *Journal of Digital Economy*, 3, 1-13. <https://doi.org/10.1016/j.jdec.2024.05.003>
- Gretzel, U., & Fesenmaier, D. R. (2009). *The SAGE Handbook of Tourism Studies*, SAGE Publications Ltd, Thousand Oaks, USA, 736 p.
- Iansiti, M., & Levien, R. (2004). Strategy as ecology. *Harvard Business Review*, 82(3), 68-81. <https://www.hbs.edu/faculty/Pages/item.aspx?num=16827>
- Issakov, Y., Kamelkhan, G., Imanbekova, B., Zhoya, K., Zheldibayev, A., Molzhigitova, D., & Dávid, L. D. (2023). Study of the problems and prospects of small tourism business development in the city of Almaty. *GeoJournal of Tourism and Geosites*, 46(1), 293-303. <https://doi.org/10.30892/gtg.46133-1027>
- Issakov, Y., Laiskhanov, S., Mazbayev, O., Ussenov, N., Zheldibayev, A., Kamelkhan, G., & Dávid, L. D. (2022). Opportunities to use mobile GIS applications in the formation of tourist and local lore competencies in students: case study in Almaty, Kazakhstan. *GeoJournal of Tourism and Geosites*, 41(2), 597-605. <https://doi.org/10.30892/gtg.41234-86>
- Ma, H. (2024). Development of a smart tourism service system based on the Internet of Things and machine learning. *The Journal of Supercomputing*, 80(5), 6725-6745. <https://doi.org/10.1007/s11227-023-05719-w>
- Majid, G. M., Tussyadiah, I., & Kim, Y. R. (2024). Exploring the potential of chatbots in extending tourists' sustainable travel practices. *Journal of Travel Research*, 00472875241247316. <https://doi.org/10.1177/00472875241247316>
- Mandić, D., Knežević, M., Borovčanin, D., & Vujko, A. (2024). Robotisation and service automation in the tourism and hospitality sector: a meta-study (1993-2024). *GeoJournal of Tourism and Geosites*, 55(3), 1271-1280. <https://doi.org/10.30892/gtg.55327-1299>
- Mathew, D., Shukla, V. K., Beena, F., Shankar, N., & Moid, S. (2024). Role of IoT in the Tourism Industry. In *Artificial Intelligence for Smart Technology in the Hospitality and Tourism Industry* (pp. 131-141). Apple Academic Press.
- Meier, A., Eller, R., & Peters, M. (2025). Creating competitiveness in incumbent small and medium-sized enterprises: A revised perspective on digital transformation. *Journal of Business Research*, 186, 115028. <https://doi.org/10.1016/j.jbusres.2024.115028>
- Mikhaylova, A., Goncharova, J., Plotnikova, A., & Mikhaylov, A. (2021). Digital capacity of Russian tourist territories. *GeoJournal of Tourism and Geosites*, 35(2), 322-331. <https://doi.org/10.30892/gtg.35209-655>
- Moore, J. F. (1993). Predators and prey: a new ecology of competition. *Harvard Business Review*, 71(3), 75-83. <https://scholar.archive.org/work/oinou2fa4jg4hotjqy3t5vnnw4/access/wayback/http://blogs.harvard.edu/jim/files/2010/04/Predators-and-Prey.pdf>
- Moore, J. F. (1996). *The Death of Competition: Leaders and Laggards in the New Business Ecosystem*, HarperBusiness, New York, USA, 133 p.
- Nautiyal, R., Polus, R., Tripathi, A., & Shaheer, I. (2023). "To use or not to use" – Mobile technology in nature-based tourism experience. *Journal of Outdoor Recreation and Tourism*, 43, 100667. <https://doi.org/10.1016/j.jort.2023.100667>
- Ng, S. L. (2022). Bibliometric analysis of literature on mountain tourism in Scopus. *Journal of Outdoor Recreation and Tourism*, 40, 100587. <https://doi.org/10.1016/j.jort.2022.100587>

- Nowacki, M., & Niezgodá, A. (2023). Identifying memorable hotel experiences: analysis of TripAdvisor reviews. *Miscellanea Geographica*, 27(2), 66-74. <https://doi.org/10.2478/mgrsd-2023-0006>
- Ogotu, H., El Archi, Y., & Dávid, L. D. (2023). Current trends in sustainable organization management: a bibliometric analysis. *Oeconomia Copernicana*, 14(1), 11–45. <https://doi.org/10.24136/oc.2023.001>
- Otarbayeva, A. B., Arupov, A. A., Abaidullayeva, M. M., Dadabayeva, D. M., & Khajiyeva, G. U. (2024). Investment cooperation as a digital economy development method for the Republic of Kazakhstan and the EU. *World Development Perspectives*, 36, 100636. <https://doi.org/10.1016/j.wdp.2024.100636>
- Pencarelli, T. (2020). The digital revolution in the travel and tourism industry', *Information Technology and Tourism*, 22(3), 455-476. <https://doi.org/10.1007/s40558-019-00160-3>
- Phoong, S. W., Phoong, S. Y., & Khek, S. L. (2024). Virtual Reality in the Tourism Sector: A Bibliometric Systematic Literature Review of the Development and Future Trends. *SAGE Open*, 14(4), 21582440241290933. <https://doi.org/10.1177/21582440241290933>
- Porter, M.E. (2008). *On Competition*, Harvard Business Press, Boston, USA, 544 p.
- Rahmat, A. F., Bujdosó, Z., Zhu, K., Kapil, H., Kaliyeva, A., Beisakhmet, A., Iskakova, K., Zhakupova, A., Abisheva, Z., Sultangaliyev, A., Plokhikh, R., & Dávid, L. D. (2024). Wider Landscapes Become Tourismscapes: Bibliometric Analysis and Identification of Key Issues in the Literature. *Journal of Sustainability Research*, 6(2), e240021. <https://doi.org/10.20900/jsr20240021>
- Rakhmetova, D., Nurgaliyeva, A., Yesmagzam, V., Takhtayeva, R., & Khassenova, K. (2024). Priority Directions and Trends of the Business Sector in Tourism: The Case of Kazakhstan. *Opportunities and Risks in AI for Business Development: Volume 1*, 669-681. [https://doi.org/10.1007/978-3-031-65203-5\\_59](https://doi.org/10.1007/978-3-031-65203-5_59)
- Robertson, J., Vella, J., Duncan, S., Pitt, C., Pitt, L., & Caruana, A. (2024). Beyond surveys: leveraging automated text analysis of travellers' online reviews to enhance service quality and willingness to recommend. *Journal of Strategic Marketing*, 32(4), 516-535. <https://doi.org/10.1080/0965254X.2023.2256738>
- Rodrigues, V., Breda, Z., & Rodrigues, C. (2024). The implications of industry 4.0 for the tourism sector: a systematic literature review. *Heliyon*, 10, e31590. <https://doi.org/10.1016/j.heliyon.2024.e31590>
- Rosário, A. T., & Dias, J. C. (2024). Exploring the landscape of smart tourism: A systematic bibliometric review of the literature of the Internet of Things. *Administrative Sciences*, 14(2), 22. <https://doi.org/10.3390/admsci14020022>
- Roziqin, A., Kurniawan, A. S., Hijri, Y. S., & Kismartini, K. (2023). Research trends of digital tourism: a bibliometric analysis. *Tourism Critiques: Practice and Theory*, (ahead-of-print).
- Santarsiero, F., Carlucci, D., & Schiuma, G. (2024). Driving digital transformation and business model innovation in tourism through innovation labs: An empirical study. *Journal of Engineering and Technology Management*, 74, 101841. <https://doi.org/10.1016/j.jengtecman.2024.101841>
- Schaffer, N., Engert, M., Sommer, G., Shokoui, J., & Kremer, H. (2021). The Digitized Ecosystem of Tourism in Europe: Current Trends and Implications. In: Wörndl, W., Koo, C., Stienmetz, J.L. (eds). *Information and Communication Technologies in Tourism 2021*. Springer, Cham. [https://doi.org/10.1007/978-3-030-65785-7\\_34](https://doi.org/10.1007/978-3-030-65785-7_34)
- Shaimardanov, Z. N. (2022). *Turizm Kazahstana 2017-2021: statisticheskij sbornik 2022 [Tourism of Kazakhstan 2017-2021: statistical collection 2022]*, Bureau of National Statistics, Astana, Republic of Kazakhstan, 106 p.
- Shevyakova, A., Munsh, E., & Arystan, M. (2019). Towards diversification of the economy of Kazakhstan via information support for the tourism industry. *Insights into Regional Development*, 1(2), 129-137. [https://dx.doi.org/10.9770/ird.2019.1.2\(5\)](https://dx.doi.org/10.9770/ird.2019.1.2(5))
- Shilibeikova, B. S., & Plokhikh, R. V. (2024). International practice in applying elements of tourism digital ecosystems. *Bulletin of Toraihyrov University. Economics series*, 2, 397-410. <https://doi.org/10.48081/jxji6695>
- Shrestha, D., Wenan, T., Gaudel, B., Rajkarnikar, N., & Jeong S. R. (2021). Digital Tourism Business Ecosystem: Artifacts, Taxonomy and Implementation Aspects. *International Journal of Innovative Research in Computer Science and Technology (IJIRCST)*, 9(5), 1-13. <https://doi.org/10.21276/ijircst.2021.9.5.1>
- Solakis, K., Katsoni, V., Mahmoud, A. B., & Grigoriou, N. (2024). Factors affecting value co-creation through artificial intelligence in tourism: a general literature review. *Journal of Tourism Futures*, 10(1), 116-130. <https://doi.org/10.1108/JTF-06-2021-0157>
- Sousa, N., Alén, E., Losada, N., & Melo, M. (2024). Virtual reality in tourism promotion: A research agenda based on a bibliometric approach. *Journal of Quality Assurance in Hospitality & Tourism*, 25(2), 313-342. <https://doi.org/10.1080/1528008X.2022.2112807>
- Suanpang, P., & Pothipassa, P. (2024). Integrating Generative AI and IoT for Sustainable Smart Tourism Destinations. *Sustainability*, 16(17), 7435. <https://doi.org/10.3390/su16177435>
- Sun, Q., Huang, X., & Liu, Z. (2022). Tourists' digital footprint: prediction method of tourism consumption decision preference. *The Computer Journal*, 65(6), 1631-1638. <https://doi.org/10.1093/comjnl/bxab210>
- Tleuberdinova, A., Salauatova, D., & Pratt, S. (2024). Assessing tourism destination competitiveness: the case of Kazakhstan. *Journal of Policy Research in Tourism, Leisure and Events*, 16(2), 265-283. <https://doi.org/10.1080/19407963.2022.2027954>
- TTDI (2021). *Travel and Tourism Development Index 2021: Rebuilding for a Sustainable and Resilient Future 2022*. World Economic Forum, Geneva, Switzerland, 91 p.
- Wan, Y. N., & Forey, G. (2024). Hospitality discourse on social media: Evaluating online complaints and service recovery for luxury hotels. *Journal of Language Teaching and Research*, 15(2), 364-373. <https://doi.org/10.17507/jltr.1502.05>
- Wendt, J. A. (2020). Directions and area of tourism research in Kazakhstan. *GeoJournal of Tourism and Geosites*, 32(4), 1418-1424. <https://doi.org/10.30892/gtg.32433-589>
- Wibowo, T. W., Santosa, S. H. M. B., Susilo, B., & Purwanto, T. H. (2021). Revealing tourist hotspots in Yogyakarta city based on social media data clustering. *GeoJournal of Tourism and Geosites*, 34(1), 218-225. <https://doi.org/10.30892/gtg.34129-640>
- Williams, M., & McHenry, M. (2020). The increasing need for geographical information technology (GIT) tools in geoconservation and geotourism. *Geoconservation Research*, 3(1), 17-32. <https://doi.org/10.30486/gcr.2020.1901102.1019>
- Yanis, M., Zainal, M., Putra, R. A., & Paembonan, A. Y. (2023). Integration of QR-Code and web-based applications for developing digital tourism in Iboih Village, Indonesia as a lesson learned media on the volcanic island. *GeoJournal Tourism Geosites*, 47(2), 499-507. <https://doi.org/10.30892/gtg.47217-1049>
- Ying, L., Ziyi, Q., Shizhuan, H., Yan, L., & Tongqian, Z. (2024). The development of digital tourism in China. *Cogent Social Sciences*, 10(1), 2347013. <https://doi.org/10.1080/23311886.2024.2347013>