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БАЯНДАМАЛАР ЖИНАҒЫ**

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THE APPLICATION OF ARTIFICIAL INTELLIGENCE TO ENHANCE THE LEVEL OF SERVICE IN THE TOURISM INDUSTRY OF KAZAKHSTAN

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Annotation. This article explores the adoption of artificial intelligence in Kazakhstan's tourism sector, highlighting potential benefits and barriers. It presents the results of a Google survey assessing the effectiveness of AI in improving service standards. The study found significant barriers to AI integration, including limited technical knowledge, significant upfront investment, and concerns about reducing the personal touch in customer service. The article ends with a proposal to create a single travel portal QazaqTravelHub.

Keywords: *artificial intelligence, tourism, innovation, Google survey, personalized service.*

Introduction

In conditions of fierce competition and economic instability, the integration of artificial intelligence (further – AI) stands at the forefront of technological innovation, poised to revolutionize various industries, including the tourism industry. As AI continues to permeate diverse sectors, its integration into tourism holds profound implications for enhancing customer experiences, optimizing operations, and driving sustainable growth. Thus, the interconnectedness with over 32 spheres of industry, ranging from transportation and hospitality to entertainment and retail, underscores the vast potential for AI to redefine the landscape of travel and hospitality.

It should be noted that the term “artificial intelligence” evolved a few years later and is attributed to John McCarthy, a computer scientist and researcher in the field of cognitive sciences, who organized the first academic conference on the subject in 1956, and to Marvin Lee Minsky, who was trained as a mathematician and was involved in research, inventions, and many developments in this field. It was Marvin Lee Minsky who coined the popular definition of AI, noting that “AI is the science of making machines do things that would require intelligence if done by men” [1]. While Russian researchers V.N. Sinelnikova and O.V. Revinsky understand AI as a computer program created by a person and capable (due to the command architecture embedded in it) of creating new information or objectively expressed results of its activities [2]. Since the late 1990s, AI research has been instrumental in tourism for forecasting hotel occupancy and demand, as noted by Kirtil and Aşkun [3]. Early AI applications included expert systems, also known as CRS or GDS, which automated travel planning tasks like flight bookings, hotel reservations, and car rentals. Over time, the travel industry continues to use more advanced AI techniques and technologies to improve personalization, recommendation systems, and customer experience in travel planning and booking systems [4].

Moreover, the use of AI in the tourism industry has significantly changed the customer experience around the world. Various countries are using AI technologies to provide personalized experiences, streamline operations and improve customer satisfaction. More and more businesses in the industry are relying on AI solutions, and the travel AI industry is estimated to exceed \$1.2 billion by 2026 [5]. The use of robotic services can provide tourism and hospitality businesses with the opportunity to differentiate, improve their services and increase their efficiency. For instance, For example, Bulgaria's Integrated Digital Tourism Information System (IDTIS) uses artificial intelligence to offer tourists a comprehensive digital platform that provides personalized information and offers, enhancing the visitor experience through smart itineraries and real-time updates. Also provides tourism statistics not only for the state, but also for general use [6]. In contrast, Singapore's Tourism Analytics Network (STAN) uses artificial intelligence to analyze big data to decipher travel patterns and preferences, thereby helping businesses optimize services and improve overall destination management [7].

The table below provides a comprehensive view of the top 10 countries for Global Artificial Intelligence Index (GAI) and Government AI Readiness Index (GAIRI) in 2023 (Table 1).

Table 1 – Top 10 Countries by Global Artificial Intelligence Index (GAI) and Government AI Readiness Index (GAIRI) for 2023

№	Top 10 countries (GAI 2023)	Score in GAI 2023	Top 10 countries (GAIRI 2023)	Score in GAIRI 2023
1	USA	100	USA	84.40
2	China	61.5	Singapore	81.97
3	Singapore	49.7	UK	78.57
4	UK	41.8	Finland	77.37
5	Canada	40.3	Canada	77.07
6	South Korea	40.3	France	76.07
7	Israel	40.0	South Korea	75.65
8	Germany	39.2	Germany	75.26
9	Switzerland	39.7	Japan	75.08
10	Finland	34.9	Netherlands	74.47
Note - Compiled by the author based on the sources [8-9]				

Table 1 shows that the USA, Singapore and the UK lead the GAI and GAIRI 2023, demonstrating their potential to advance tourism through advanced artificial intelligence and enabling infrastructure, driving global industry trends.

Material and Methods

In order to find out about the current state and development options for the use of artificial intelligence in the tourism industry in Kazakhstan, a Google survey was conducted. The Google survey, conducted among 75 participants, revealed detailed demographics and preferences in the Respondent Profile section. The age distribution shows that the majority are in the 18–24 (48%) and 25–34 (14,7%) groups, indicating that the respondents are predominantly young and middle aged.

In terms of gender, the split shows 58,7% (44) female participants and 41,3% (31) male participants, suggesting fair representation of both genders.

As for education, more than half of the respondents (62,7%) have higher education, 22,7% have secondary education, and 14,7% have postgraduate education, which indicates a highly educated sample group. In addition, the distribution of employment sectors is diverse: the largest representation is in sectors such as tourism (34,7%), education and training (13,3%), arts, entertainment, and recreation (10%), as well as hospitality (12%). This diversity shows that the survey covered a wide range of specialists, which can provide a broader understanding of artificial intelligence in tourism.

Moreover, the survey results reveal a diverse range of monthly salaries among respondents. Notably, the largest salary segment comprises 25,3% of respondents earning between 201,000 to 300,000 KZT. Meanwhile, 21,3% of respondents report earning between 301,000 to 400,000 KZT, and another 21,3% fall within the 401,000 to 500,000 KZT salary range.

Moreover, the survey revealed varying levels of awareness and interaction with AI technologies within the tourism industry in Kazakhstan. While 50,7% of respondents indicated being somewhat aware of AI usage, 30,7% expressed being not very aware, and 6,7% stated not being aware at all.

Furthermore, Figure 1 shows the divided preferences among respondents regarding AI interaction and human interaction in travel queries. A notable 36% said their choice depends on the situation, indicating a balanced view of AI integration. An equal share of 29.3% preferred either AI services or human representatives, which does not suggest an overwhelming preference for one over the other. A small segment of 5.3% had no preference, highlighting different consumer expectations and the potential of both artificial intelligence and human services in the travel industry.

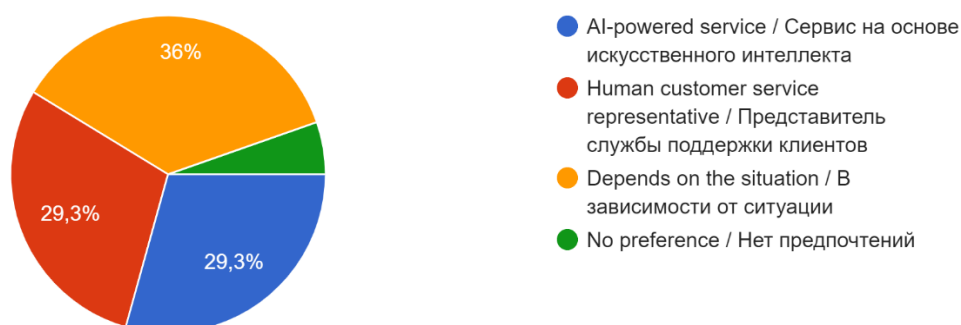


Figure 1. Consumer Preferences for AI vs. Human Interaction in Tourism Inquiries

Note - compiled by the author based on survey results

Responses to the question about desired improvements or additional features in AI-powered tourism services highlighted a range of interests and needs. Participants called for enhancements such as real-time updates, personalized recommendations, and streamlined booking processes. Suggestions also included practical features like weather alerts, local event recommendations, and alternative routing options for navigating roadblocks. Moreover, respondents expressed interest in AI-generated special tours and visual enhancements, such as more images or 3D views of tourist attractions and hotels, to better inform their travel decisions.

Moreover, AI has the potential to significantly enhance various services in Kazakhstan's tourism sector, as indicated by survey respondents (Figure 2).

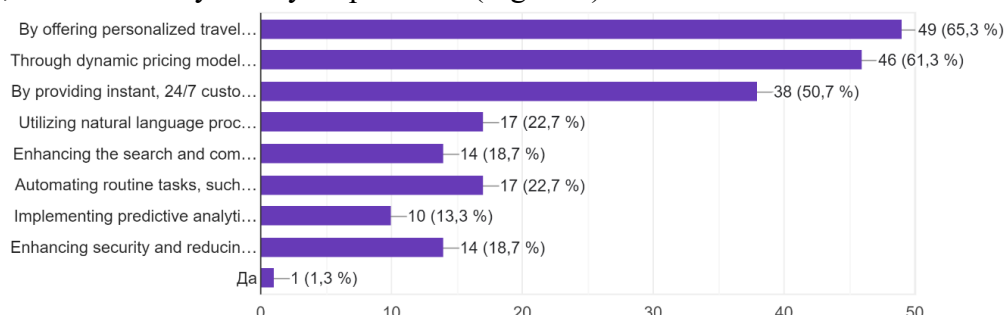


Figure 2. Graph of anticipated potential of AI in improving services in the tourism sector of Kazakhstan

Note - compiled by the author based on survey results

Specifically, 65,3% believe AI could notably improve personalized travel recommendations, followed closely by 61,3% of participants recognizing its potential for market analysis and trend prediction endorsing enhanced customer service through chatbots and virtual assistants.

It is noteworthy that 50,7% of respondents would probably recommend AI-enhanced tourism services based on their experiences or perceptions, while only 4% definitely would not recommend such services. Based on the results of the survey key travel problems faced by tourists include the

following:

- flight delays or cancellations affecting 50,7% of respondents;
- difficulty finding up-to-date travel information, cited by 44%;
- complicated booking processes experienced by 34,7%;
- lost luggage or baggage issues reported by 30,7%, etc.

Thus, a Google survey, highlights a combination of theoretical insights and practical observations. There is noticeable enthusiasm about the potential of AI to improve personalization, improve service delivery and streamline operational tasks in the sector. However, concerns about privacy, data security and the need for culturally sensitive AI solutions point to areas that require careful development. The survey results suggest a positive view of AI, with a majority willing to recommend AI-enhanced services, despite acknowledging challenges such as technical knowledge gaps and implementation costs. This reflects an overarching belief in the ability of AI to positively transform tourism, balancing innovation with human-centered service delivery.

Recommendation

In addition, during the process of the research, it was found that in Kazakhstan there is currently no single database dedicated exclusively to tourism and operating on the basis of artificial intelligence. Thus, the need to create a unified tourism statistics portal in Kazakhstan using AI becomes obvious. Taking inspiration from the examples of Bulgaria's Integrated Digital Tourist Information System (IDTIS) and Singapore's Singapore Tourism Analytics Network (STAN), the development of a single portal for tourism statistics and analytics in Kazakhstan, similar to those implemented in Bulgaria and Singapore, could have a significant impact on the tourism industry countries. Therefore, to understand why we need this single portal and how it will help us develop tourism in Kazakhstan, a comparison was made of the current state of online resources for tourism in Kazakhstan and potential changes after the creation of a single tourism portal using artificial intelligence (Figure 3).

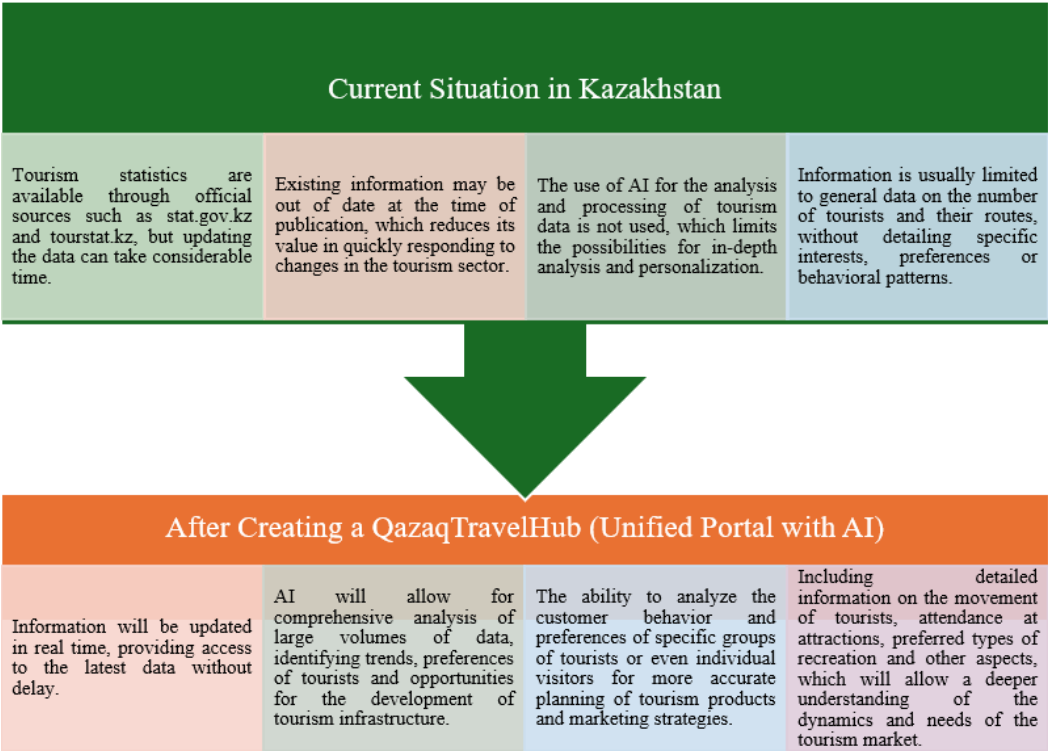


Figure 3. Today's tourism statistics and the future with AI in Kazakhstan
Note - compiled by the author

As shown in Figure 3, the creation of a single tourism portal with AI in Kazakhstan will provide an opportunity for more effective management of the tourism sector, increasing its

attractiveness and competitiveness. The portal will be a valuable tool for government, the private sector and researchers, providing them with access to timely, relevant and in-depth information about tourism in Kazakhstan. It should be noted that the main goal is to develop and implement an innovative portal “QazaqTravelHub”, which will use advanced artificial intelligence technologies to collect, process, analyze and provide updated statistical data and analytical information in the tourism sector of Kazakhstan. The portal aims to improve the quality and accessibility of information for all stakeholders, including government agencies, tourism companies, researchers and potential visitors to the country.

Thus, QazaqTravelHub reflects the essence of the portal as a central hub for collecting, analyzing and disseminating information about tourism in Kazakhstan. The use of the word "Qazaq" in the name emphasizes national identity and pride in cultural heritage, while "TravelHub" indicates a global focus and innovative approach to tourism development. Moreover, to create a single portal for tourism in Kazakhstan that would collect statistics and information on tourist flows, traveler preferences and the economic impact of tourism, it is worth collaborating with various data sources and organizations. The main directions of such cooperation are demonstrated in Table 2.

Table 2 - Collaborative Partners for Qazaq Travel Hub

№	Partnership Organization	Contribution
1	Airports	Data on tourist flows, information on visas and countries of origin of travelers
2	Tour operators and Travel agencies of Kazakhstan	Providing data on customer demand and preferences, sold tour packages and air tickets, the most popular tourism products and services, as well as feedback from travelers
3	Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan	Official tourism statistics
4	National company "Kazakh Tourism"	Information on strategic directions for tourism development
5	Local tourism associations and associations (KTA, Association of Travel Agencies of Kazakhstan, Kazakhstan Association of Hotels and Restaurants, the Ecotourism Association of Kazakhstan, the Association of Guides and Tour Guides)	Data on traveler trends and preferences
6	International organizations (WTO, etc.)	Comparing local statistics with global trends
7	Research institutes and universities	Academic research and analytical reports
8	Technology partners and data providers (Kazdream Technologies, Nursoft, Zero to One Labs, Astana Hub, Kazakhtelecom)	Solutions for data collection, analysis and visualization
9	State tourism authorities at the regional level	Provide relevant and valuable information for integration into QazaqTravelHub.
10	Transport companies and organizations	Data on traveler flows and popular destinations
Note - compiled by the author		

The table 15 illustrates the variety of data sources and organizations, cooperation with which will be key for the successful creation and operation of the QazaqTravelHub portal.

Conclusion

In conclusion, the importance of using artificial intelligence to improve the quality of customer service in the tourism industry of Kazakhstan is emphasized. The lack of a single database in Kazakhstan dedicated exclusively to tourism and powered by AI, indicates the need to create a tool

such as “QazaqTravelHub”. The proposed management model implies the creation of a multi-level structure that ensures effective interaction between all stakeholders. Thus, “QazaqTravelHub” represents a strategic resource that will rethink approaches to tourism in Kazakhstan, improving data-driven decision making and strengthening the country's position in the global tourism market.

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ҒАЛАМДЫҚ ЖАҒАНДАНУДЫҢ ГАСТРОНОМИЯЛЫҚ ТУРИЗМНІҢ ДАМУЫНА ӘСЕРІ

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Аңдатпа. Ұлттар арасындағы өзара байланыс пен өзара тәуелділіктің арту процесі ретінде анықталған жаһандану қазіргі дәуірдің айқындаушы белгісі болды. Ол экономикалық, әлеуметтік, мәдени және технологиялық аспектілерді қамтиды, қоғамдардың жаһандық ауқымда өзара әрекеттесуі мен дамуын қалыптастырады. Жаһандану көптеген артықшылықтар мен мүмкіндіктер әкелгенімен, оның адам өмірінің әртүрлі аспектілеріне әсері туралы пікірталастар мен алаңдаушылықтарды тудырды. Бұл мақала жаһанданудың көп қырлы табиғатын екі жүзді қылыш ретінде зерттеп, оның артықшылықтары мен қиындықтарын көрсетеді.

Оң жағынан, жаһандану бүкіл әлемде бұрын-соңды болмаған экономикалық өсу мен өркендеуге ықпал етті. Сауданы ырықтандыру, инвестициялық ағындар және технологиялық жетістіктер арқылы экономикалардың интеграциясы әлемнің көптеген бөліктерінде өнімділіктің артуына, жұмыс орындарының ашылуына және өмір сүру деңгейінің