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USING ARTIFICIAL INTELLIGENCE LANGUAGE MODELS IN TOURISM: COMMUNICATION, PERSONALIZATION, AND OPERATIONAL EFFICIENCY

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Using artificial intelligence language models in tourism: communication, personalization, and operational efficiency

Abstract. The article explores embedding artificial intelligence technologies, including an emphasis on language models, into tourism organisations' systems of operation. Analysis determines AI's capacity to enhance communicative processes, automate day-to-day tasks, and enable service tailoring through functions like chatbots, virtual assistants, and automated content generation instruments. Based on present empirical studies, quantitative evidence, and foreign case studies, authors demonstrate that implementation of AI fosters organisational effectiveness improvement, cost reduction, and competitiveness enhancement within the global digital economy. A particular emphasis of the tourism industry of Kazakhstan stands out especially as AI integration is identified as a centrepiece of national innovation and economic development strategy. Moreover, it is revealed that language models prove particularly efficient in overcoming linguistic and cultural boundaries and thus enable context-aware multilingual support and data-based decision-making. Finally, authors affirm that AI usage extends from technological development to an outright strategic necessity of environmentally sustainable development, customer satisfaction improvement, and innovative methods development in contemporary tourism.

Key words: tourism industry, artificial intelligence, digital transformation, innovation in tourism, customer communication, tourism marketing, language models.

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Туризмде жасанды интеллект тілдік модельдерін пайдалану: коммуникация, дербестендіру және операциялық тиімділік

Аңдатпа. Мақаласы туристік ұйымдардың операциялық жүйелеріне тілдік модельдерге ерекше назар аударып, жасанды интеллект технологияларының интеграциясын қарастырады. Зерттеу AI-ның коммуникациялық процестерді жақсартуға, күнделікті тапсырмаларды автоматтандыруға және чат-боттар, виртуалды көмекшілер және мазмұнды автоматты түрде жасау жүйелері сияқты құралдар арқылы қызметтерді жекелендіруді жақсарту мүмкіндігін талдайды. Заманауи ғылыми зерттеулерге, статистикалық деректерге және халықаралық жағдайлық зерттеулерге сүйене отырып, авторлар AI енгізу операциялық тиімділікті арттыруға, шығындарды азайтуға және жаһандық цифрлық экономикадағы бәсекеге қабілеттілікке ықпал ететінін көрсетеді. Қазақстанның туристік секторына ерекше назар аударылады, AI енгізу инновациялар мен экономиканы жаңғыртудың ұлттық стратегияларының негізгі құрамдас бөлігі ретінде танылады. Мақалада тіл үлгілері есіресе лингвистикалық және мәдени кедергілерді еңсеруде тиімді, осылайша контекстке тәуелді көптілді қолдау мен деректерге негізделген шешім қабылдауға мүмкіндік береді. Авторлар AI қолдану тек технологиялық серпіліс емес, сонымен қатар тұрақты өсу, тұтынушылардың қанағаттануын арттыру және заманауи туризмдегі инновациялық тәжірибелерді дамыту үшін стратегиялық қажеттілік болып табылады деген қорытындыға келеді.

Түйін сөздер: туризм индустриясы, жасанды интеллект, цифрлық трансформация, туризмдегі инновация, тұтынушылармен байланыс, туризм саласындағы маркетинг, тілдік модельдер.

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Использование языковых моделей искусственного интеллекта в сфере туризма: коммуникация, персонализация и операционная эффективность

Аннотация. В данной статье рассматривается интеграция технологий искусственного интеллекта с особым акцентом на языковые модели, операционные системы туристских организаций. В исследовании анализируется способность искусственного интеллекта (ИИ) улучшать коммуникационные процессы, автоматизировать рутинные задачи и повышать персонализацию услуг с помощью таких инструментов как чат-боты, виртуальные помощники и системы автоматической генерации контента. Опираясь на современные научные исследования, статистические данные и международные кейсы, авторы демонстрируют, что внедрение ИИ способствует повышению операционной эффективности, снижению затрат и конкурентоспособности в глобальной цифровой экономике. Особое внимание уделяется туристскому сектору Казахстана, где внедрение ИИ признано ключевым компонентом национальных стратегий инновации и экономической модернизации. В статье также отмечается, что языковые модели особенно эффективны в преодолении лингвистических и культурных барьеров, что позволяет обеспечить контекстно-зависимую многоязычную поддержку и принятие решений на основе данных. Авторы приходят к выводу, что использование ИИ – это не только технологический прорыв, но и стратегическая необходимость для устойчивого роста, повышения удовлетворенности клиентов и развития инновационных практик в современном туризме.

Ключевые слова: туристская индустрия, искусственный интеллект, цифровая трансформация, инновации в туризме, коммуникация с клиентами, маркетинг в сфере туризма, языковые модели.

Introduction. In the contemporary era, artificial intelligence (AI) has gained significant prominence across a wide range of sectors in both developed and developing economies. With the rapid advancement of technology, artificial intelligence has evolved from a theoretical concept into a practical tool capable of enhancing and transforming organisational processes, thereby contributing to increased organisational efficiency. In this context, Kazakhstan, as a dynamically developing country, should strive to become a leader in the implementation of smart digital systems and the development of artificial intelligence-based solutions. This objective has been identified by the government as a key national priority and is reflected in strategic programmes aimed at fostering innovation, digitalisation, and the modernisation of the economy [1].

The reason for this emphasis is the potential of AI to fundamentally change interactions between customers, partners and other stakeholders by improving communications, automating routine tasks and improving decision-making based on data analysis. The introduction of an automated interaction process into an organisation's operational structure not only increases internal productivity but also opens up new avenues for sustainable growth and competitiveness. The tourism industry, with its dynamic and customer-oriented nature, is one of the most promising areas for the integration of artificial intelligence.

The use of language models in particular – a form of AI trained on vast corpora of textual data – offers unique advantages in the tourism sector. These models can understand, processing, and generating human-like text, enabling them to facilitate natural

interactions between tourists and service providers. This potential is especially relevant in multilingual and multicultural environments, where accurate, context-sensitive communication is essential. The utilisation of such models can enhance the communication process through social electronic channels and digital platforms, providing timely support, personalised recommendations, and accurate information, regardless of language barriers [2].

The development of the tourism industry in Kazakhstan is also pivotal to the strengthening of the national economy and the enhancement of the country's global standing. The tourism sector contributes significantly to employment creation, cultural exchange, and the attraction of foreign investment. It also serves as a platform for showcasing the country's heritage, landscapes, and traditions to a global audience. In the context of globalization and rapid technological advancement, it is important for Kazakhstani organizations to implement modern, innovative methods to attract tourists, improve service levels, and strengthen their position in the global market.

The introduction of artificial intelligence into the tourism sector promises to solve many of the modern problems facing the industry and, as such, could become a potential driver of positive change: from optimising customer service and personalising experiences to automating internal processes and marketing strategies, AI can significantly improve the operational efficiency of tourism organisations. Language models, in particular, can play an important role in changing the current state of development of the tourism sector by improving various aspects of it. Their implementation is in line with the global

trend of digital transformation, which requires tourism businesses to take a timely approach to trends and a desire to develop both the tourism sector and their business.

Consequently, the adoption of AI technologies, especially advanced language models, is not merely a technological trend but a strategic necessity. Their use can lead to improved customers experience and increased satisfaction, and greater business efficiency. Ultimately, this integration will not only enhance the performance of tourism enterprises but also potentially boost industry revenue and elevate the level of tourist satisfaction.

Purpose of the study. The primary objective of this research endeavour is to investigate the utilisation of artificial intelligence within the tourism sector, with a particular focus on language models, in order to evaluate their potential for enhancing communication, personalising services, automating routine operations, and increasing organisational efficiency.

Objectives of the study:

- to study the current state of artificial intelligence implementation in the tourism industry, considering global practices and the national digital transformation strategy in Kazakhstan;
- examine the functions and capabilities of AI language models;
- study the practical application of AI technologies in tourism;
- highlight the advantages and challenges associated with integrating AI into tourism businesses.

Materials and methods. To write this article, we analyzed the scientific literature on the use of artificial intelligence in tourism, which allowed us to determine the current state of the art and identify key concepts. The study employs a qualitative research design based on a structured literature review and comparative analysis. Academic publications from Scopus, Web of Science, Google Scholar and industry reports from leading tourism organisations were examined using predefined inclusion criteria: relevance to AI applications in tourism, publication date between 2015–2024, and availability of empirical or conceptual findings. Sources that lacked academic credibility or duplicated data were excluded. The analysis followed a three-stage procedure: (1) identification and categorisation of AI tools used in tourism; (2) comparative evaluation of AI-driven solutions based on functionality, benefits, and limitations; (3) synthesis of practical implications for customer service, marketing, and operational management. Case studies from global tourism markets were additionally reviewed to illustrate real-world implementation of AI systems. The methodological approach ensures a

comprehensive understanding of how AI technologies shape modern tourism practices.

For a more comprehensive study of this topic, we utilized analytical materials from industry and government reports. We also employed a comparative analysis based on international experience with artificial intelligence in tourism.

Official company documents and reports from leading technology corporations provided access to up-to-date information on the latest advances in artificial intelligence and their practical applications, including chatbots, virtual assistants, and automated content generation tools.

Research case studies from tourism companies allowed us to analyze real-world examples of AI implementation, clearly demonstrating how new technologies function in practice and the steps needed for their further improvement. Finally, all materials were carefully evaluated to confirm their reliability, accuracy, and relevance for the purposes of the study. Methods and sources were assessed to synthesise complete and valid information with a logical component.

Results. This study contributes to existing research by systematising international evidence on the use of language models in tourism and contextualising it within the specific conditions of the Kazakhstani tourism market. Language models represent a crucial component of contemporary artificial intelligence, exerting a significant influence on the expansion of the tourism industry [3]. These models contribute to a change in the model of customer interaction through the automatic execution of routine processes and effective data analysis. The capacity to comprehend and articulate natural language, in addition to the ability to adapt to the individual requirements of specific users, renders language models an indispensable instrument for customising tourism offerings and generating compelling content [4].

The integration of these models within the tourism sector has been shown to yield several benefits, including enhanced operational efficiency, reduced expenditure, and more effective marketing strategies. Big data analysis with the help of language models allows for the identification of current trends and the forecasting of demand, thus enabling the informed management of decisions. Furthermore, the integration of chatbots and virtual assistants, which are based on language models, has the potential to provide continuous customer support, thereby reducing the workload of staff members and enhancing user satisfaction [5]. The key impacts of artificial intelligence implementation on the performance indicators of tourism organisations are presented in Table 1.

Table 1 – Impact of implementation of AI into activity of tourist organisations

Metric	Before (Example)	After (Example)	Change	Notes
First Response Time	5–10 min	1–3 min	65–80 %	Raw data required to calculate CI and p-values
Dialog Automation Rate (Closed Without Agent)	0–10 %	40–60 %	+40–60 pp	Accuracy depends on scenarios and NLU quality
Escalation Rate to Human Agent	30–50 %	10–30 %	–20–35 pp	Breakdown by request type recommended
Booking Conversion Rate	1–4 %	4–11 %	+3–7 pp	Estimated range from the document; statistical significance requires A/B data
Average Order Value (AOV)	\$X	\$X × 1.02–1.04	+2–4 %	Transaction-level data needed for confidence intervals
CSAT / NPS	Baseline	Baseline × 1.10–1.15	+10–15 %	Based on pilot estimates; requires sufficient sample sizes.

Note: Compiled by the authors based on references

Research in marketing confirms the active use of artificial intelligence technologies, including language models, for a wide range of tasks, from content creation to data analysis. The integration of language models within the tourism sector signifies more than a mere reaction to contemporary challenges; it is also a pivotal element in enhancing corporate competitiveness within the market. The potential for the further integration

of these language models into the tourism sector is significant, with the development of innovative services that promise to enhance the travel experience for all users, making it more comfortable, accessible and engaging [6]. The current applications of artificial intelligence within the tourism sector, as well as areas with significant potential for further integration of language models, are presented in Table 2.

Table 2 – Ways of utilization of AI functions in several business activities of organisations

Section	Key Ideas, Findings, and Recommendations
Introduction / Overview	Large language models and AI accelerate information search for travelers, improve service convenience, and help optimize company operations
Main AI Application Areas in Tourism	Travel personalization; chatbots and virtual assistants; operations and pricing automation; marketing and analytics
Travel Personalization	Analysis of preferences (interests, budget, travel style) → tailored itineraries, hotels, excursions; creation of a “smart tour” experience
Chatbots and Virtual Assistants	24/7 responses, booking assistance, information on visas/transport/attractions; integration with booking systems
Company Operations Optimization	Automation of inquiries and complaints handling; dynamic pricing; reduced staff workload; higher operational efficiency
Marketing and Promotion	Generation of personalized advertising copy and email campaigns; segment-based targeting
Analytics and Forecasting	Analysis of seasonality, destination popularity, and reviews; demand forecasting to adjust offerings
Economic Impact (Figures)	AI in tourism market estimated at ~\$2.95B in 2024, projected to exceed ~\$13B by 2030, CAGR ≈ 28.7 %, justifying investments
Practical Example (Tourist in Almaty)	A chatbot provides: restaurant lists, excursion schedules (e.g., Charyn Canyon), transport and weather tips — all in one dialogue
Strengthening the Empirical Section — Measurement Recommendations	Collect 8–12 weeks of historical data + 4–6 weeks post-implementation; breakdown by channels, segments, and time; tie KPIs to revenue and margin
Evaluation Design (A/B and Quasi-Experiments)	A/B testing (portion of traffic via AI); if impossible — difference-in-differences by destinations/hotels; expert labeling of answer quality (200–500 dialogues)

Section	Key Ideas, Findings, and Recommendations
Answer Quality & Analysis Metrics	Completeness, accuracy, empathy; inter-rater validation; impact models (linear/logistic regression) controlling for seasonality and promotions
Separate Case: OTA Chatbot — Context & Goal	Online Travel Agency: goal is to increase online conversion and reduce support load via LLM-powered conversational booking
Solution Architecture (OTA Case)	Multilingual conversational assistant; integrations with catalogs, booking, CRM, payments; manual escalation; logging and anonymization
Case Metrics & Results (Estimated Ranges)	First response time: –65–80 %; automated dialogs: 40–60 %; escalations: –20–35 %; conversion +3–7 pp; AOV +2–4 %; CSAT/NPS +10–15 %
Case Evaluation Method	50/50 A/B test with traffic stratification; quasi-experiments; expert review of 400 dialogs; quality thresholds (accuracy ≥ 90 %, completeness ≥ 85 %)
Ethics and Risks	Model error control, transparency to users, data protection, option to opt out of the bot
Conclusion and Scaling	ROI achievable in 4–6 months via support cost savings and conversion growth; roadmap: trip builder, dynamic recommendations, voice channel, local scenarios
Kazakhstan Cases and National Initiatives	KAZLLM (QazCode + National Information Technologies) — national Kazakh-language model; tour operator chatbots (e.g., Join UP!); AI-based review analytics; museum and excursion projects
Example Impacts in Kazakhstan (Estimated)	Response time reduced to 1–2 minutes in pilots; up to 50 % request automation; CSAT +10–15 % in pilot solutions
Note: Compiled by the authors based on references	

Discussion. “A language model can be defined as a machine learning system that analyses vast quantities of textual data in order to understand and reproduce natural language with a high degree of accuracy”. This definition is taken from the Microsoft AI Blog, the official blog of Microsoft (one of the world’s largest software and computer hardware companies), which publishes articles, news and research related to artificial intelligence. The definition provided by the Microsoft AI Blog states that a language model is an “artificial intelligence trained to analyse and generate text based on input data.” It functions by predicting the subsequent piece of text based on context, and is employed for the purposes of answering questions, composing texts and a wide range of other tasks. OpenAI is a research company and laboratory dedicated to the development and study of artificial intelligence technologies. The following are the collective notions about language models from leading software companies, including language models [7].

The advancement in the development of language models and other AI solutions provides opportunities to transform various sectors of the country’s economy [8]. One such area is tourism, where AI technologies can significantly improve service quality, personalise offers and optimise processes, among others.

Language models have a wide range of capabilities, making them versatile:

- first, language models can recognize the meaning of text, identify key points, and analyze context;
- second, language models can generate meaningful texts, enabling coherent responses to questions, the creation of various descriptions, etc;

- third, language models can adapt responses to user requests, taking into account their preferences, communication style, etc.;

- fourth, language models can provide recommendations and forecasts in various areas, including planning and problem-solving, based on the data provided;

- fifth, current technology allows speakers of different languages to maintain contact without knowing other languages.

Artificial intelligence is currently widely used in all fields, including tourism services. Social media plays a significant role in the modern tourism industry, creating content and maintaining customer relationships, where artificial intelligence capabilities are also utilized. AI helps meet individual customer needs, identify the strengths and weaknesses of travel companies, and much more. Furthermore, the model has the capacity to evaluate the strengths and weaknesses of a company by means of an analysis of both positive and negative traveller reviews.

One of the most common applications of language models is in the form of chatbots or online consultants. This utilisation of language models in the context of tourism offers several advantages. Primarily, the model is capable of providing automated information to clients or tourists, answering questions pertaining to both the tour and the destination, and receiving, processing, and providing statistical feedback regarding a particular tour or company [9].

In the course of its interaction with a tourist, the artificial intelligence adapts its behaviour in accordance with the context of communication,

adjusting its style to cater to the tourist's preferences and providing recommendations or information that aligns with their needs, considering individual preferences, cultural characteristics and interests.

Consequently, the utilisation of artificial intelligence in certain operational processes within a company has the potential to enhance its efficiency.

It is important to note that language models are already employed in various tourism organisations for a range of purposes.

Statistics from 2023 reveal that the number of tourists in Almaty city exceeded 2 million. The city is home to 67 tourism agencies, all of which are registered with the Kazakhstan Tourism Association. The duration of the contractual agreement between a tourist and a travel agent can vary significantly, with some transactions taking several days to complete.

The integration of a language model within the operational framework of a tourism enterprise has the potential to streamline this process, thereby reducing the temporal demands associated with contractual negotiations.

In the context of business assistance, the role of assistants has been shown to facilitate novel prospects for companies seeking to augment their marketing and sales endeavours through the provision of multilingual customer assistance. For instance, a report by Klarna revealed that its assistant can effectively perform the duties of 700 customer service agents, including foreign-speaking travellers [10]. In this regard, there is a need to optimise, automate and improve the process of interaction between managers and clients.

In the contemporary information society, the initial impression of a travel company is frequently

established long before any personal interaction. It is becoming increasingly evident that customers are demonstrating a propensity to engage with a broader array of online resources in order to gather preliminary information and consider available options. Prior to contacting a firm, preliminary research is conducted using various internet platforms to obtain information about the company. Such research may include web searches, social networks, targeted advertising, or other means [11].

The responsibility for enhancing the company's online visibility and image lies with the marketing department. The individual in this role is expected to possess a comprehensive understanding of contemporary leisure trends, demonstrate proficiency in crafting captivating social media content, and optimise the website to enhance its visibility in search engine results. It is also noteworthy that artificial intelligence is being widely implemented in these activities.

Modern Artificial Intelligence (AI) technologies are being actively implemented in various aspects of marketing activities, which is an integral part of tourism organisations promotional strategy, according to a HubSpot survey of 1,350 marketing, sales, customer support and SEO professionals from around the world [12]. The aggregated data on the primary areas of artificial intelligence application according to the HubSpot survey are presented graphically in Figure 1:

- 1) content creation (48 % of respondents);
- 2) data analysis and reporting (45 %);
- 3) information retrieval (45 %);
- 4) conducting research (32 %).

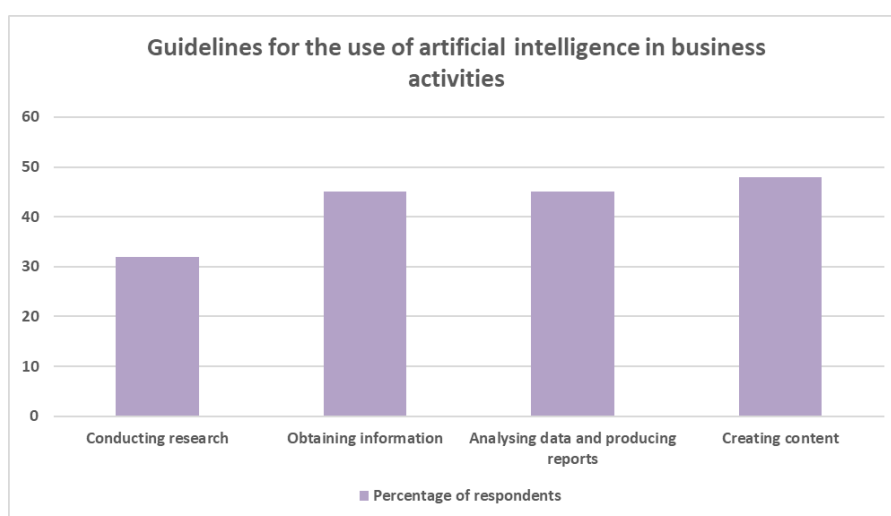


Figure 1 – Guidelines for the use of artificial intelligence in business activities

Note: Compiled by the authors based on references

The most popular tools among marketers are chatbots (53 %), text generators (44 %), visual tools (44 %) and audio technologies (31 %).

According to HubSpot, using AI to create content can save marketers up to 3 hours per piece of content. Summary data on the key areas of artificial

intelligence use by marketers is presented in a pie chart in Figure 2:

- 1) text content development (20 %);
- 2) image creation (20 %);
- 3) content planning (18 %).

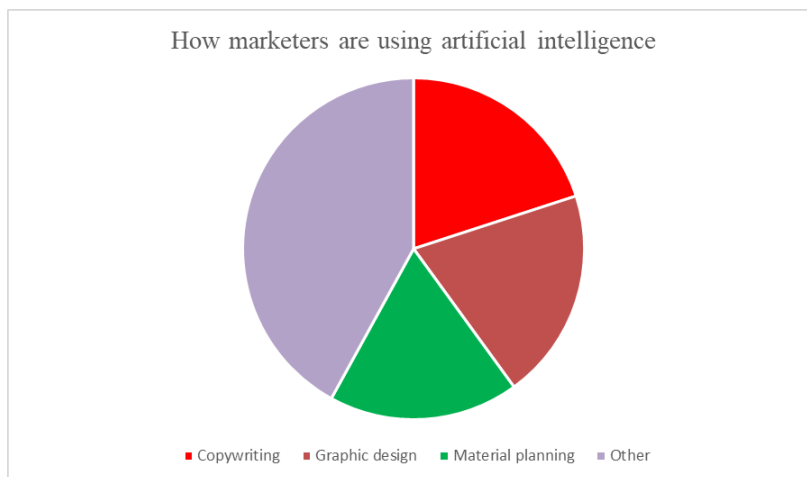


Figure 2 – How marketers are using artificial intelligence
 Note: Compiled by the authors based on references

When a customer contacts a travel agent to buy a trip to a particular country, the interaction process is usually as follows:

1) consultation: the agent finds out the tourist's needs and wishes, such as the purpose of the trip, climate preferences, length of stay, desired services and budget, and discusses the available options according to the input data provided by the tourist;

2) information provision: The agent offers the best tour options and provides detailed information about each of them (country of stay, name of the hotel and its level of service, cost of the trip), tells about entry regulations, rules of behaviour in the country, information useful during the stay;

3) tour selection: the client chooses the most suitable tour for him/her;

4) contract conclusion: a contract is concluded between the agency and the client, which reflects the fact of payment and purchase of a trip by the latter.

Considering the existing possibilities of language models, the activity of travel agencies can be improved by delegating the responsibility of communication and offering the best tour for the customer to language models in the form of chatbots in social networks, messengers or on the company's website.

Once the agent has obtained the necessary information, their primary task is to verify the

accuracy of the data received and finalise the contract. As customers interact with AI systems rather than directly with human agents, personnel are able to allocate more time to other operational tasks or to serve additional clients.

Moreover, tourists can receive relevant information about the destination both prior to departure and during their stay. This approach supports travel agencies by reducing the need for repeated or ad hoc staff training and minimising the reliance on specialised personnel, which is particularly important given the seasonal nature of tourism-related employment [13].

Gursoy D., Hengxuan Chi O., Lu L., Nunkoo R., Nunkoo R. developed a readiness scale for the integration of service robots and an acceptance model for the use of artificial intelligence devices to understand the need to introduce artificial intelligence functions in tourism organisations [14].

In a study on the use of artificial intelligence in business conducted by Katherine Haan and published in Forbes Advisor magazine, 56 % of the business owners surveyed (600) have implemented or plan to implement AI for customer service. When it comes to using language models to interact with customers, 73 % of respondents use them for instant messaging, 61 % for email newsletters, 55 % for personalised

recommendations, 49 %, 46 %, 42 % and 36 % for text messaging, personalised advertising, long-form text content and phone calls respectively. For example, 49 % of respondents use artificial intelligence to optimise text messages [15].

Modern language models offer a wide range of opportunities to transform the tourism industry, increase business efficiency and improve the customer experience. Their application covers key aspects: personalisation of services, automation of customer interactions, content creation for marketing, data analysis and trend forecasting.

The integration of language models allows travel agents to reduce the time spent on routine tasks such as advising customers and selecting tours, freeing up resources for more complex tasks. The use of chatbots and automated systems helps to increase customer convenience and speed up interactions.

Statistics show that a significant proportion of businesses are already actively using artificial intelligence to optimise their operations [16]. This shows the growing demand for artificial intelligence technologies, which are becoming an integral part of modern business, including tourism.

In the context of rapid digital transformation, artificial intelligence (AI), in particular modern language models, plays a central role in the modernisation of the tourism industry by offering tools for automating routine operations, in-depth analysis of reviews and personalisation of services. Unlike many previous studies that focus predominantly on technological capabilities, this paper emphasises organisational readiness and contextual factors relevant to Kazakhstan's tourism sector.

The analysis demonstrates that while the functional potential of language models is largely universal, their effectiveness depends on local conditions, including multilingual demand, seasonality of tourist flows, and limited human resources within small and medium-sized travel agencies. For Kazakhstani tour operators, language models are not merely a marketing tool but a mechanism for compensating structural constraints, such as staff shortages and uneven customer demand.

The findings suggest that the most tangible short-term effects of implementation can be achieved in customer communication, preliminary tour selection and informational support before and during travel. At the same time, the introduction of language models requires organisational changes, including staff training, the redesign of business processes and the establishment of hybrid interaction models combining human expertise with AI-generated recommendations.

From an analytical perspective, the study highlights that successful integration depends on a staged approach: pilot testing, assessment of economic efficiency and gradual scaling. Ethical and regulatory considerations, particularly those related to data protection and algorithmic transparency, remain critical constraints that must be addressed at the institutional level. Further research should focus on quantitative evaluation of performance indicators and return on investment, as well as on user acceptance of AI-assisted services among both employees and tourists.

Conclusion. Language models, as a key element of modern artificial intelligence, play a crucial role in the transformation of the tourism industry. They offer a qualitatively new level of interaction with customers, automation of routine processes and efficient data analysis. The capacity to comprehend and generate natural language, in addition to adapting to the individual requirements of users, renders language models an indispensable tool for personalising travel offers and creating engaging content.

The integration of language models within the tourism industry has been demonstrated to facilitate the optimisation of operational processes, the reduction of costs, and the enhancement of marketing strategies. Big data analysis employing language models facilitates the identification of prevailing trends and the estimation of future demand, thereby enabling informed management decisions. Chatbots and virtual assistants based on language models provide 24/7 customer support, reducing staff workload and increasing user satisfaction.

Research in marketing confirms the active use of artificial intelligence technologies for a wide range of tasks, from content creation to data analysis.

However, alongside the clear advantages, the introduction of language models and other AI technologies into the tourism industry brings a number of challenges that cannot be overlooked. One of the most sensitive issues is the protection of personal data. Since AI solutions depend on collecting and analysing large volumes of information, concerns about privacy, data security and the possibility of unauthorised access naturally come to the forefront. Ethical dilemmas also remain highly relevant: how transparent are the algorithms that make decisions, can they unintentionally reinforce bias, and how can the industry maintain genuine human interaction while embracing technological efficiency?

Another barrier lies in the uneven level of digital literacy among tourism professionals. Without continuous training and institutional support, staff may find it difficult to master new tools, which ultimately

slows down the digital transformation process. Only by approaching AI integration responsibly and thoughtfully can the tourism industry ensure

that technological progress strengthens, rather than undermines, the quality, sustainability and humanity of tourism services.

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