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THE IMPACT OF DIGITAL MARKETING ON CONSUMER BEHAVIOR IN DOMESTIC TOURISM IN KAZAKHSTAN

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Abstract. In the context of the accelerated digital transformation of the economy, digital technologies and artificial intelligence are becoming significant factors in changing the mechanisms of operation of the tourism industry and consumer behaviour. The study aims to identify the main trends and substantiate the mechanism by which digital technologies and artificial intelligence affect the development of domestic tourism in the Republic of Kazakhstan. The empirical analysis covers the period from 2021 to 2025. The information base of the study consists of official statistical data from the Republic of Kazakhstan, including indicators from the Tourism Satellite Account, accommodation facility activities, domestic tourist flows, and e-commerce. Methods for analysing time series, calculating relative and absolute changes, conducting comparative and structural analyses, comparing tourism and digital indicators, and applying conceptual modelling were used. A steady expansion of the domestic tourism market has been established: the number of resident visitors served by accommodation facilities increased by 68.3%, the gross value added generated directly in tourism increased by 201.2%, and consumption related to domestic tourism increased by 251.7%. At the same time, intensive development of the digital consumer environment has been

identified, accompanied by a significant increase in the scale of e-commerce and digital acquisition of services. The comparison of indicators indicates the synchrony of the development of the domestic tourism market and the digital environment; however, given the multifactorial nature of tourism demand, the identified relationship is not interpreted as a direct causal dependence. The scientific novelty of the study lies in distinguishing between digitalisation and intellectualisation as interrelated yet sequential stages in the technological transformation of tourism. An author's model has been developed for the transition from the development of digital infrastructure and digital consumer behaviour - through the reduction of information and transaction costs and the increased accessibility of the tourism product - to the accumulation of data, the use of artificial intelligence, and the personalisation of the tourism offer. The practical significance of the results lies in their potential for use in forming an integrated digital tourism ecosystem and in determining directions for implementing artificial intelligence technologies in the development of domestic tourism in Kazakhstan.

Keywords: domestic tourism, digitalisation, artificial intelligence, digital technologies, tourism ecosystem, Kazakhstan

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ҚАЗАҚСТАНДАҒЫ ІШКІ ТУРИЗМ САЛАСЫНДА ЦИФРЛЫҚ МАРКЕТИНГТІҢ ТҰТЫНУШЫЛАРДЫҢ МІНЕЗ-ҚҰЛҚЫНА ӘСЕРІ

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Аннотация. Экономиканың жеделдетілген цифрлық трансформациясы жағдайында цифрлық технологиялар мен жасанды интеллект туристік саланың жұмыс істеу тетіктері мен тұтынушылық мінез-құлықтың өзгеруінің

маңызды факторларына айналуда. Зерттеудің мақсаты Қазақстан Республикасының ішкі туризмін дамытуға цифрлық технологиялар мен жасанды интеллекттің әсер ету тетігін негіздеу және негізгі үрдістерді анықтау болып табылады. Эмпирикалық талдау 2021-2025 жылдарды қамтиды. Зерттеудің ақпараттық базасын туризмнің қосалқы шотының, орналастыру орындарының қызметінің, ішкі туристік ағынның және электрондық коммерцияның көрсеткіштерін қоса алғанда, Қазақстан Республикасының ресми статистикалық деректері құрады. Динамикалық қатарларды талдау, салыстырмалы және абсолютті өзгерістерді есептеу, салыстырмалы және құрылымдық талдау, туристік және цифрлық көрсеткіштерді салыстыру, сондай-ақ тұжырымдамалық модельдеу әдістері қолданылды. Ішкі туристік нарықтың тұрақты кеңеюі белгіленді: орналастыру орындарында қызмет көрсетілетін резидент-келушілер саны 68,3% - ға, туризмде тікелей құрылатын жалпы қосылған құн - 201,2% - ға, ал ішкі туризмге қатысты тұтыну-251,7% - ға өсті. Сонымен бірге электрондық коммерция мен қызметтерді цифрлық сатып алу ауқымының едәуір ұлғаюымен қатар жүретін цифрлық тұтыну ортасының қарқынды дамуы анықталды. Көрсеткіштерді салыстыру ішкі туристік нарық пен цифрлық ортаның дамуының синхрондылығын көрсетеді, алайда туристік сұраныстың көп факторлы сипатын ескере отырып, анықталған байланыс тікелей себептік тәуелділік ретінде түсіндірілмейді. Зерттеудің ғылыми жаңалығы туризмнің технологиялық трансформациясының өзара байланысты, бірақ дәйекті кезеңдері ретінде цифрландыру мен интеллектуализацияны ажырату болып табылады. Ақпараттық және транзакциялық шығындарды азайту және туристік өнімнің деректерді жинақтауға, жасанды интеллектті қолдануға және туристік ұсынысты дербестендіруге қолжетімділігін арттыру арқылы цифрлық инфрақұрылымды және цифрлық тұтынушылық мінез-құлықты дамытудан көшудің авторлық моделі әзірленді. Нәтижелердің практикалық маңыздылығы оларды интеграцияланған цифрлық туристік экожүйені қалыптастыру және Қазақстанның ішкі туризмін дамытуға жасанды интеллект технологияларын енгізу бағыттарын айқындау кезінде пайдалану мүмкіндігімен айқындалады.

Түйін сөздер: ішкі туризм, цифрландыру, жасанды интеллект, цифрлық технологиялар, туристік экожүйе, Қазақстан

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ВЛИЯНИЕ ЦИФРОВОГО МАРКЕТИНГА НА ПОВЕДЕНИЕ ПОТРЕБИТЕЛЕЙ ВО ВНУТРЕННЕМ ТУРИЗМЕ В КАЗАХСТАНЕ

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Аннотация. В условиях ускоренной цифровой трансформации экономики цифровые технологии и искусственный интеллект становятся значимыми факторами изменения механизмов функционирования туристской отрасли и потребительского поведения. Цель исследования заключается в выявлении основных тенденций и обосновании механизма воздействия цифровых технологий и искусственного интеллекта на развитие внутреннего туризма Республики Казахстан. Эмпирический анализ охватывает период 2021–2025 гг. Информационную базу исследования составили официальные статистические данные Республики Казахстан, включая показатели Вспомогательного счета туризма, деятельности мест размещения, внутреннего туристского потока и электронной коммерции. Применены методы анализа динамических рядов, расчета относительных и абсолютных изменений, сравнительного и структурного анализа, сопоставления туристских и цифровых показателей, а также концептуального моделирования. Установлено устойчивое расширение внутреннего туристского рынка: количество посетителей-резидентов, обслуженных местами размещения, увеличилось на 68,3%, валовая добавленная стоимость, создаваемая непосредственно в туризме, - на 201,2%, а потребление, относящееся к туризму внутри страны, - на 251,7%. Одновременно выявлено интенсивное развитие цифровой потребительской среды, сопровождаемое существенным увеличением масштабов электронной коммерции и цифрового приобретения услуг. Сопоставление показателей свидетельствует о синхронности развития внутреннего туристского рынка и цифровой среды, однако с учетом многофакторной природы туристского спроса выявленная взаимосвязь не интерпретируется как прямая причинная зависимость. Научная новизна исследования заключается в разграничении цифровизации и интеллектуализации как взаимосвязанных,

но последовательных этапов технологической трансформации туризма. Разработана авторская модель перехода от развития цифровой инфраструктуры и цифрового потребительского поведения через снижение информационных и транзакционных издержек и повышение доступности туристского продукта к накоплению данных, применению искусственного интеллекта и персонализации туристского предложения. Практическая значимость результатов определяется возможностью их использования при формировании интегрированной цифровой туристской экосистемы и определении направлений внедрения технологий искусственного интеллекта в развитие внутреннего туризма Казахстана.

Ключевые слова: внутренний туризм, цифровизация, искусственный интеллект, цифровые технологии, туристская экосистема, Казахстан

Introduction. The modern tourism industry is undergoing large-scale digital transformation, which affects how tourism services are produced, promoted, acquired, and consumed. The spread of internet technologies, digital platforms, mobile applications, electronic payments, and online booking systems has changed the traditional model of interaction between tourists and service providers. If, in the early stages, the development of e-tourism was primarily associated with transferring individual operations to the digital environment, the current stage is characterised by the integration of digital technologies into virtually all elements of the tourism cycle - from searching for information and choosing a destination to booking, paying, navigating, and receiving services during the trip (Buhalis, Law, 2008).

The development of the digital environment helps reduce information asymmetry between tourists and service providers, expands access to information about destinations, enables quick comparisons of prices and the characteristics of tourism products, and reduces transaction costs when organising a trip. As a result, digitalisation becomes not only a technological tool for enterprise development in the tourism industry but also a factor in changing consumer behaviour and the structure of the tourism market. In modern scientific literature, this process has been developed in the concepts of smart tourism and smart tourism ecosystem, in which digital infrastructure, data, platforms, and the interaction of participants in the tourism system are viewed as interconnected elements in the formation of a new tourism environment (Gretzel et al., 2015a; Gretzel et al., 2015b; Li et al., 2017).

Digital technologies are of particular importance in the field of domestic tourism. Unlike organised international trips, domestic travel can largely be shaped by consumers themselves, without the direct involvement of traditional intermediaries. The ability to remotely obtain information about tourist attractions, compare destinations and travel costs, purchase tickets, book accommodation, and use digital navigation services expands the possibilities for independently

organising a trip. In this context, the digital accessibility of the tourism product can be considered a factor contributing to the development of domestic tourism mobility.

For the Republic of Kazakhstan, this issue is of additional importance due to the country's vast territory, the spatial remoteness of tourist destinations, and the uneven development of transport and tourism infrastructure. Differences in the information available about tourist sites and the territorial dispersion of tourist resources can increase the costs of searching for and planning domestic trips. Under such conditions, digital technologies create the possibility of partially overcoming spatial and informational constraints by expanding access to information about tourist resources and by developing electronic booking, digital payments, and other remote services.

The issues related to the digital transformation of tourism in Kazakhstan have already been addressed in the scientific literature. Mussina et al. (2020) examined the digitalisation of Kazakhstan's tourism industry from the perspective of expanding the use of internet technologies and improving interaction between participants in the tourism market. Subsequent studies link the development of digital tools to e-commerce in the services and tourism sectors, the digitalisation of tourist facilities, and the increased readiness of the industry for further technological transformation (Amangozhayeva et al., 2022; Kulakhmetova et al., 2024; Shilibekova, Plokhikh, 2025). At the same time, a significant portion of existing research focuses on individual digital tools or institutional aspects of digitalisation. In contrast, the quantitative comparison of the dynamics of the digital consumer environment and the domestic tourism market at the national level remains underdeveloped. The relevance of such an analysis is enhanced by the changes that occurred in Kazakhstan's tourism industry between 2021 and 2025. According to official statistics, this period was characterised by an increase in the number of resident visitors served by accommodation facilities, growth in tourism consumption, expansion of the range of services offered by accommodation facilities, and development of the industry's entrepreneurial base. At the same time, there was an intensive expansion of e-commerce and remote channels for purchasing goods and services, which indicates a qualitative change in the digital consumer environment (Bureau of National Statistics of the Republic of Kazakhstan, 2026a; 2026b; 2026c; 2026d).

The next stage of the technological transformation of tourism is linked to the development of artificial intelligence. Unlike basic digitalisation, which enables the transfer of information, operations, and interactions into an electronic environment, artificial intelligence technologies create opportunities to analyse accumulated data, automate decision-making, and provide personalised interactions with tourists. Modern research links the use of AI in tourism to recommendation systems, intelligent search, automated route planning, demand forecasting, virtual consulting, and the personalisation of tourism offerings (Tussyadiah, 2020; López-Naranjo et al., 2025)—thereby systematising the research.

To achieve the set goal, the following tasks are envisaged: to analyze the dynamics of the main economic indicators of Kazakhstan's tourism industry; to assess the changes in the domestic tourist flow and the infrastructure of accommodation facilities; to identify the main trends in the development of the digital consumer environment; to compare the dynamics of tourism and digital indicators; to determine the place of artificial intelligence in the system of technological transformation of tourism; to develop a conceptual model of the impact of digital technologies and AI on the development of domestic tourism.

The scientific novelty of the study lies in the development of an approach to assessing the technological transformation of domestic tourism, based on distinguishing between digitalisation and intellectualisation as interrelated yet sequential stages in the development of the tourism ecosystem. Unlike approaches that view digital technologies and artificial intelligence primarily as a set of individual tools for serving tourists, this work proposes a consistent mechanism for their impact: the development of digital infrastructure promotes the spread of digital consumer behavior and reduces information and transaction costs; increasing the digital accessibility of tourism products creates the prerequisites for expanding internal tourism mobility; digital interaction enables the accumulation of data that artificial intelligence technologies can later use for intelligent analysis, forecasting, and personalization of tourism offerings.

The practical significance of the study lies in the potential to use the results obtained to improve state and sectoral policies for the digital transformation of tourism, develop integrated tourism services, enhance the digital readiness of enterprises, and create a data-driven tourism ecosystem capable of consistently implementing artificial intelligence technologies.

Literature review. The digital transformation of the tourism industry is considered in modern scientific literature as a complex process involving changes in the methods of producing, promoting, and consuming tourism services under the influence of information and communication technologies. One of the foundational works in this area is the study by D. Buhalis and R. Law, which links the development of e-tourism to the gradual penetration of information technologies into the business processes of the tourism industry, as well as into booking systems, promotion, and interaction with consumers (Buhalis, Law, 2008). Subsequently, this approach was significantly expanded: the research focus shifted from the digitalisation of individual operations to the development of an integrated, data-driven tourism environment built on platforms and the interaction among various market participants.

The development of the smart tourism concept has become a key stage in the theoretical understanding of the industry's digital transformation. Gretzel et al. (2015a) view smart tourism as a system in which technological infrastructure, data, digital services, and participant interactions create new forms of tourist experience. In turn, the concept of a smart tourism ecosystem emphasises

viewing digital transformation not as a set of isolated technological solutions but as a holistic ecosystem that includes tourists, businesses, destinations, digital platforms, and institutional participants (Gretzel et al., 2015b). A similar approach is developed in the study by Li et al. (2017), in which smart tourism is linked to the integration of information services and the use of digital data to improve the quality of interactions with tourists.

The expansion of digital technologies has significantly changed tourists' decision-making processes. Online platforms, mobile apps, digital navigation, electronic payments, and booking services make it possible to obtain and compare information about destinations, transportation, accommodation, and service costs even before the trip begins. This helps reduce information asymmetry and transaction costs, expands the possibilities for independent travel planning, and transforms the role of traditional intermediaries in the tourism market (Buhalis, Law, 2008; Gretzel et al., 2015a). In this sense, digitalisation acts not only as a tool for the technological modernisation of tourism enterprises but also as a factor that changes consumer behaviour.

This mechanism is of particular importance for domestic tourism. Domestic trips can largely be organised by consumers independently. Hence, the availability of digital information, remote booking, mobile payments, and navigation services directly affects the time and resources required to prepare a trip. The expansion of the digital environment can thereby increase the accessibility of the tourism product and expand the range of destinations considered by potential tourists. From a theoretical perspective, this allows us to interpret digitalisation as a factor that reduces barriers to entry into the domestic tourism market and increases the consumer's autonomy in planning a route and selecting a set of services.

Alongside the development of digital platforms, attention in the scientific literature has intensified regarding the role of data as a fundamental resource of the intelligent tourism system. Within the smart tourism ecosystem, the exchange of data among tourists, businesses, destinations, and technological platforms is of fundamental importance, as the accumulation and processing of information form the basis for predicting needs and personalising the tourism offer (Gretzel et al., 2015b). At the same time, researchers note that the intelligence of a tourism system should not be reduced solely to the presence of modern technologies: the quality of data, the integration of services, the institutional environment, and the ability of various participants to use digital solutions to create additional value play an important role (Li et al., 2017).

A new stage in the technological transformation of tourism has been the spread of artificial intelligence. Tussyadiah (2020), analysing research on automation, artificial intelligence, and robotics in tourism, shows that intelligent technologies are beginning to cover a wide range of functions - from customer service to making management decisions. Unlike traditional digitalisation, which primarily involves transferring individual operations to an electronic environment, artificial

intelligence enables the use of accumulated datasets for forecasting, automation, pattern recognition, and adapting the tourism offer to a specific user's characteristics.

Modern systematic reviews confirm the rapid expansion of the practical use of AI in the tourism business. López-Naranjo et al. (2025) identify key areas of AI application, including the improvement of operational efficiency, the enhancement of the customer experience, the optimisation of resources, and the creation of new forms of interaction with tourists. Personalisation is of particular importance: algorithms can analyse accumulated data on a user's behaviour, preferences, and previous experience and, on this basis, generate a more relevant tourism offer (López-Naranjo et al., 2025).

The possibilities for providing intelligent support to tourists have expanded significantly with the development of generative artificial intelligence. Suanpang et al. (2024) consider the integration of generative AI and Internet of Things technologies as a technological foundation for the development of sustainable smart tourism destinations. This approach предполагает a shift from static digital services to systems that interact with tourists in real time, take context changes into account, and adapt recommendations based on the situation. Thus, generative AI becomes not just an additional communication channel, but a potential element of the intellectual infrastructure of a tourism destination.

A separate area of research concerns the transformation of the tourist experience itself. Stankov et al. (2025) link the spread of mobile smart technologies to the emergence of phygital tourism experiences, which combine the physical space of travel with digital elements of interaction. In this model, a mobile device serves as a constant intermediary between the tourist and the destination, providing information search, personalised recommendations, navigation, communication, and access to additional services. The development of consumer-oriented AI is strengthening this trend and creating the prerequisites for the hyper-personalization of the tourist experience (Stankov et al., 2025).

At the same time, the use of artificial intelligence in tourism is associated not only with advantages but also with limitations. The scientific literature highlights problems with data quality and representativeness, algorithmic transparency, the protection of personal information, user trust, digital inequality, and the excessive technologization of the tourist experience (Tussyadiah, 2020; López-Naranjo et al., 2025). Consequently, the effectiveness of intellectual transformation is determined not only by the scale of the introduction of new technologies but also by the quality of the institutional, informational, and ethical mechanisms for their use.

In the context of the Republic of Kazakhstan, research on the digitalisation of the tourism industry remains significantly more limited than the international body of scientific literature. Mussina et al. (2020) examine the digitalisation of Kazakhstan's tourism industry through the expanded use of internet technologies, the need to improve information exchange, and the enhancement of the efficiency of intermediary links. This work formed one of the early research foundations

for analysing the digital transformation of Kazakhstani tourism. Still, it refers to a period that predates the current stage of intensive development of the platform economy and generative artificial intelligence.

Subsequent studies have expanded the scope of issues related to the digitalisation of Kazakhstan's tourism sector. Amangozhayeva et al. (2022) analyse the development of e-commerce in the services and tourism sectors, linking it to the broader adoption of digital channels for interacting with consumers. Kulakhmetova et al. (2024) examine the digitalisation of tourist sites as a tool for developing cultural tourism and increasing the accessibility of tourist resources. A later study by Shilibekova and Plokhikh (2025) focuses on the readiness of Kazakhstan's tourism industry for digital transformation and the existing barriers to further development. Taken together, these studies confirm the growing importance of digital technologies for the industry, but they predominantly use qualitative, comparative, and institutional approaches (Amangozhayeva et al., 2022; Kulakhmetova et al., 2024; Shilibekova & Plokhikh, 2025).

An analysis of the existing literature allows us to identify several research gaps. Firstly, a significant portion of research examines digital transformation through individual technologies - platforms, booking systems, e-commerce, mobile applications, or artificial intelligence. In contrast, the digital environment is shaped by their complex interaction. Secondly, digitalisation and artificial intelligence are often treated as elements of a single technological process, without sufficient differentiation between their functional roles and degrees of maturity. Meanwhile, AI requires an established digital infrastructure, accumulated data, and consistent user behaviour, which allows us to consider intellectualisation as the next stage in the digital development of the tourism ecosystem (Gretzel et al., 2015b; López-Naranjo et al., 2025).

Thirdly, in Kazakhstan, quantitative comparison of the dynamics of the digital consumer environment and the domestic tourism market at the national level remains underdeveloped. Existing studies confirm the expansion of digitalisation in tourism services and the growing importance of electronic interaction channels; however, a comprehensive assessment of how these processes develop in parallel with domestic tourist flows, tourist consumption, and the use of accommodation infrastructure is limited (Mussina et al., 2020; Amangozhayeva et al., 2022; Shilibekova, Plokhikh, 2025).

Based on the review conducted, this study proposes distinguishing between digitalisation and intellectualisation as interrelated yet distinct levels of technological transformation in domestic tourism. Digitalisation forms the basic infrastructure, expands digital consumer behaviour, reduces information and transaction costs, and enables data accumulation. Artificial intelligence represents the next stage in using this foundation, encompassing intelligent data analysis, forecasting, automated recommendation generation, and personalisation of the tourism offer (Tussyadiah, 2020; Suanpang et al., 2024; López-Naranjo et al., 2025).

This delineation forms the theoretical basis for the subsequent empirical assessment of the dynamics of domestic tourism and the digital consumer environment in the Republic of Kazakhstan for 2021–2025, as well as for the development of the author's model of the technological impact of digital technologies and artificial intelligence on the development of the domestic tourism market.

Materials and methods. The methodological basis of the study was shaped by the need for a comprehensive assessment of the development of domestic tourism in the Republic of Kazakhstan in the context of the accelerated digitalisation of the economy and the spread of artificial intelligence technologies. The study was conducted at the national level without regional differentiation, enabling a focus on general trends in changes in Kazakhstan's domestic tourism market and digital consumer environment.

The study period covers 2021–2025. The choice of this interval is due to the need to assess the medium-term dynamics of domestic tourism and the technological changes that occurred amid the recovery of tourist activity and the rapid spread of digital channels for consumer interaction.

The information base for the study consisted of official data from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan, including materials from the Tourism Satellite Account, statistics on the activities of accommodation facilities, indicators of domestic tourist flow and e-commerce, as well as official materials from the state bodies of the Republic of Kazakhstan in the field of tourism and digital development (Bureau of National Statistics of the Republic of Kazakhstan, 2026a; 2026b; 2026c; 2026d; Tourism Industry Committee, 2025). The methodological principles for analysing the economic role of tourism are also based on the approaches of the Tourism Satellite Account, as recommended by the World Tourism Organisation (2010).

To characterise the economic dynamics of the tourism industry, the following indicators were used: gross value added generated in tourism sectors; gross value added generated directly in tourism; domestic supply in tourism sectors; consumption related to domestic tourism; the number of legal entities and the number of people employed in tourism sectors. Using this system of indicators makes it possible to assess not only the overall economic scale of tourism-related activities but also the share of economic activity directly generated by tourist demand.

To assess internal tourism activity, indicators were used that reflect the number of resident visitors, the number of accommodation facilities served, the number of accommodation places, their simultaneous capacity, the number of bed-nights provided, and the volume of accommodation services. The choice of these indicators enables simultaneous characterisation of the dynamics of tourist demand, the development of material infrastructure, and the intensity of use of

existing capacities (Bureau of National Statistics of the Republic of Kazakhstan, 2026b; 2026c).

The methodological toolkit of the study includes the analysis of time series, the calculation of relative and absolute changes, comparative and structural analyses, the comparison of tourist and digital indicators, and conceptual modelling.

The study was carried out in several successive stages.

At the first stage, an analysis was conducted of the main economic indicators of the development of the tourism industry in the Republic of Kazakhstan. The main method used was the analysis of dynamic series, which made it possible to determine the direction and intensity of changes in the indicators under consideration between 2021 and 2025.

To characterise the overall change in the indicators, the base rate of growth was used:

$$Tgr = ((X_{2025} / X_{2021}) - 1) \times 100\%$$

where:

Tgr is the rate of growth of the indicator under study for 2021–2025;

X_{2025} is the value of the indicator in the final year;

X_{2021} is the value of the indicator in the base year.

For indicators that are already expressed as percentages, the change was calculated in percentage points:

$$\Delta X = X_{2025} - X_{2021}$$

where:

ΔX - the absolute change in the relative indicator over the study period, expressed in percentage points.

The application of this approach made it possible to determine changes in gross value added, tourist consumption, the number of economic entities, and employment, and to compare the rates of change across various components of the tourism economy.

At the second stage, an assessment was conducted of the dynamics of domestic tourist flows and the infrastructure of accommodation facilities. The number of resident visitors served by accommodation facilities was used as the main indicator of domestic tourist activity. This choice enables the separation of domestic tourist flows from inbound tourism and ensures comparability of the indicator throughout the study period.

Along with the tourist flow, the dynamics of the number of accommodation places, their simultaneous capacity, the number of bed-days provided, and the

value of the services rendered were analysed. The comparison of the growth rates of tourist flow and infrastructure indicators was used to assess the relationship between the expansion of demand and the physical expansion of supply. The higher growth rates in the number of domestic visitors and beds provided, compared with the number of accommodation facilities and their capacity, were interpreted as a sign of increased use of the existing infrastructure.

At the same time, cost indicators were analysed separately from in-kind indicators, since an increase in the monetary volume of services reflects not only a change in the physical scale of tourist activity but also the impact of the price factor. This approach avoids identifying the growth of nominal indicators with a similar increase in the real volume of tourist activity.

At the third stage, the dynamics of digitalisation in the consumer environment of the Republic of Kazakhstan are studied. In accordance with the research objective, digitalisation is considered not only a technological modernisation of enterprises in the tourism industry, but also a change in the external environment in which consumers search for, select, purchase, and pay for tourism and related services.

The volume of retail e-commerce, the share of e-commerce in the total volume of retail trade, and the volume of e-commerce services were used as measurable indicators (Bureau of National Statistics of the Republic of Kazakhstan, 2026d). The indicator of e-commerce in services is of particular importance for this study, since remote channels are used when purchasing services directly related to tourist mobility, including transport, accommodation, and other services.

When interpreting the dynamics of e-commerce, the methodological limitation of the official statistical series was taken into account. Data starting from 2022 are generated with marketplaces in mind, so the sharp increase in several indicators between 2021 and 2022 is not attributed solely to the actual expansion of digital consumption. This methodological factor was taken into account when formulating conclusions about the scale of digital transformation.

At the fourth stage, a comparative analytical approach was applied, comparing the directions and intensities of change in the domestic tourism market and the digital consumer environment. The rates of change in the number of resident visitors, tourist consumption, the volume of accommodation services, and e-commerce indicators were compared.

The purpose of this comparison was not to establish a direct cause-and-effect relationship, but to identify the synchrony and direction of the changes. This approach is due to the limited duration of the time series and the multifactorial nature of tourism demand. The development of domestic tourism is determined not only by the level of digitalisation but also by the population's income, transport accessibility, travel costs, the state of tourism infrastructure, institutional conditions, and other factors.

For this reason, the study did not use a regression model or calculate a correlation coefficient based on five annual observations. Using formal econometric methods

with such a limited number of observations could have led to statistically unstable estimates and an unjustified interpretation of the parallel dynamics of the indicators as evidence of a causal effect. Therefore, the results obtained provide an empirical basis for identifying trends and formulating subsequent research hypotheses.

A separate methodological stage concerns assessing the role of artificial intelligence. An analysis of the available official statistics revealed the absence of a comparable time series for 2021–2025 that directly characterises the scale of use of artificial intelligence technologies by enterprises in Kazakhstan's tourism sector. In this regard, the independent impact of AI on tourist flows was not quantitatively assessed. Instead, a conceptual and analytical approach was applied, within which artificial intelligence is considered as the next stage in the development of the digital tourism ecosystem. This distinction aligns with contemporary research on automation and smart technologies in tourism, where AI is primarily associated with data analysis, personalisation, intelligent search, demand forecasting, and the automation of interactions with tourists (Tussyadiah, 2020; Suanpang et al., 2024; López-Naranjo et al., 2025).

The main potential areas of AI impact identified are: personalisation of the tourism offer; intelligent search; automated route planning; virtual consulting; analysis of user preferences; forecasting of tourism demand; and adaptation of digital services to individual user characteristics.

At the final stage, the conceptual modelling method was applied, resulting in the development of an original model of the technological impact of digital technologies and artificial intelligence on the development of domestic tourism in the Republic of Kazakhstan.

The logic of the model is based on a sequential chain of interrelationships: digital infrastructure → digital consumer behaviour → reduction of information and transaction costs → increased accessibility of the tourism product → expansion of internal tourism mobility → accumulation of digital data → application of artificial intelligence → personalisation of the tourism offer.

Within the framework of the proposed model, digitalisation and artificial intelligence are considered interrelated yet functionally distinct stages of technological transformation. Digitalisation provides the infrastructure and creates digital interactions, while artificial intelligence enables the use of accumulated data to move toward more complex forms of forecasting and personalised interactions with tourists.

Thus, the methodological toolkit includes the analysis of time series, calculation of relative and absolute changes, comparative and structural analysis, comparison of tourism and digital indicators, and conceptual modelling. The selected set of methods corresponds to the established statistical base and enables the study of the development of domestic tourism in Kazakhstan in the context of digital transformation without using quantitative methods, the reliability of which cannot be ensured by the available annual observations.

Results. The analysis made it possible to identify the main changes in the development of the tourism industry in the Republic of Kazakhstan, the domestic tourist flow, and the digital consumer environment in 2021–2025. In accordance with the research methodology, the results are presented sequentially: first, the economic dynamics of the tourism industry are assessed; then, changes in domestic tourist flows and accommodation infrastructure are examined; and finally, indicators of digitalisation of the consumer environment are examined and compared with the development of domestic tourism.

At the first stage, the main economic indicators of Kazakhstan's tourism industry were assessed. The obtained results are presented in Table 1.

Table 1 – Dynamics of the main economic indicators of tourism development in the Republic of Kazakhstan for 2021–2025.

Indicators	2021	2022	2023	2024	2025	Change 2025/2021
Gross value added created in tourism industries, billion tenge	2 871,0	3 270,1	3 283,2	4 060,0	4 266,1	+48.6%
IFO of the GVA created in the tourism industry, % compared to the previous year	125,3	101,8	98,9	104,3	91,1	–
The share of GVA of tourism industries in GDP, %	3,4	3,2	2,7	3,0	2,65	–0.75 pp.
Gross value added created directly in tourism, billion tenge	572,5	1 001,0	1 184,4	1 418,5	1 724,45	+201.2%
The share of GVA generated directly in tourism in GDP, %	0,7	1,0	1,0	1,0	1,15	+0.45 pp.
Domestic supply of tourism industries, billion tenge	9 828,0	13 574,5	16 770,1	18 246,9	21 717,95	+121.0%
Consumption related to tourism within the country, billion tenge	1 130,8	2 087,6	2 759,6	3 162,8	3 977,2	+251.7%
The share of tourist consumption in the domestic supply (%	11,5	15,4	16,5	17,3	19,8	+8.3 pp.
Number of legal entities in the tourism industry, units	42 301	47 905	52 829	54 712	59 976	+41.8%
The number of people employed in the tourism industry (in thousands).	463,1	488,6	498,4	613,8	631,45	+36.4%
The share of people employed in tourism in the total number of people employed, %	5,3	5,4	5,5	6,7	6,8	+1.5 pp.

Note – compiled by the authors based on data from the Bureau of National Statistics of the Republic of Kazakhstan (2026a).

The data in Table 1 indicate a significant expansion in the value-based scale of tourism activities in Kazakhstan. The gross value added generated in the tourism sector increased from 2,871.0 billion tenge in 2021 to 4,266.1 billion tenge in 2025, representing a 48.6% increase. At the same time, the dynamics of this indicator

were heterogeneous. The physical volume index of the GVA of tourism industries amounted to 98.9% in 2023, increased to 104.3% in 2024, but fell to 91.1% in 2025. This indicates the need to distinguish between the nominal increase in value indicators and the change in the real physical volume of activity.

A more pronounced trend was observed in the gross value added generated directly by tourism. Its volume increased from 572.5 billion tenge in 2021 to 1,724.45 billion tenge in 2025, i.e., more than threefold. The cumulative growth amounted to 201.2%. At the same time, the share of directly tourism-related GVA in GDP increased from 0.7% to 1.15%, i.e., by 0.45 percentage points. At the same time, the share of GVA of the entire tourism sector in GDP changed in the opposite direction - from 3.4% in 2021 to 2.65% in 2025. This discrepancy has important analytical significance. It demonstrates the need to distinguish between the economic activity of tourism-related industries in a broad sense and the portion of added value created directly by tourist consumption.

The domestic supply of tourism-related industries increased significantly, from 9,828.0 billion tenge in 2021 to 21,717.95 billion tenge in 2025, a 121.0% increase. However, domestic tourist consumption grew even faster. Over the period under consideration, its volume increased from 1,130.8 to 3,977.2 billion tenge, representing a 251.7% increase. As a result, the share of tourist consumption in the domestic supply of tourism industries increased progressively: from 11.5% in 2021 to 15.4% in 2022, 16.5% in 2023, 17.3% in 2024, and 19.8% in 2025. Overall, over the study period, the indicator increased by 8.3 percentage points. The observed dynamics indicate that tourist consumption is expanding faster than the overall domestic supply of tourism-related industries. An increase in the entrepreneurial and labour base accompanied the expansion of the economic scale of tourism activities. The number of legal entities in the tourism sector increased from 42,301 to 59,976, a 41.8% increase. The number of employed people increased from 463.1 to 631.45 thousand, or by 36.4%, and the share of people employed in tourism-related industries in the total number of employed people increased from 5.3 to 6.8%.

Thus, the results of the first stage of analysis indicate a comprehensive expansion of Kazakhstan's tourism economy in 2021–2025. The highest growth rates were recorded for domestic tourism consumption and the gross value added generated directly in tourism.

To provide a more accurate characterisation of domestic tourism, the second stage of the study examined the dynamics of resident visitors and the infrastructure of accommodation facilities.

Table 2 – Dynamics of the domestic tourist flow and the infrastructure of accommodation facilities in the Republic of Kazakhstan for 2021–2025.

Indicators	2021	2022	2023	2024	2025	Change 2025/2021
Resident visitors, accommodation facilities served, in thousands of people.	5 145,2	6 407,3	7 054,5	7 824,4	8 659,9	+68,3%
Number of accommodation facilities, units.	3 686	3 970	3 992	4 303	4 482	+21,6%
Maximum capacity, thousand beds	193,0	203,5	207,8	225,8	233,0	+20,7%
Accommodation provided, thousand bed-days.	8 981,1	11 507,3	12 505,3	13 710,5	14 515,2	+61,6%
Volume of accommodation services, billion tenge	109,0	182,9	229,2	299,8	350,6	+221,6%
Note – compiled by the authors based on data from the Bureau of National Statistics of the Republic of Kazakhstan (2026b; 2026c).						

Domestic tourist flow exhibited positive dynamics throughout the study period. The number of resident visitors served by accommodation facilities increased from 5.15 million people in 2021 to 8.66 million people in 2025. The total growth amounted to 68.3%, or more than 3.5 million people in absolute terms. At the same time, growth was observed annually: in 2022, the number of resident visitors reached 6.41 million; in 2023, 7.05 million; in 2024, 7.82 million; and in 2025, 8.66 million. The persistence of positive dynamics over several consecutive years allows us to view the expansion of the domestic tourism market as a longer-term trend, rather than just a short-term effect of post-pandemic recovery. It is noteworthy that the physical accommodation infrastructure grew significantly more slowly than the tourist flow. The number of accommodation places increased by 21.6% between 2021 and 2025, and their combined capacity increased by 20.7%, while the number of resident visitors served increased by 68.3%. This ratio indicates an increase in the intensity of use of the existing infrastructure. This conclusion is further supported by the dynamics of the number of bed-days provided, which increased from 8.98 million to 14.52 million, or by 61.6%.

Even higher growth rates were observed in terms of the volume of accommodation services. In monetary terms, the indicator increased from 109.0 billion tenge in 2021 to 350.6 billion tenge in 2025, a 221.6% increase. At the same time, such a significant discrepancy between the dynamics of physical tourist flows and the volume of service value requires careful interpretation. The growth in the market's monetary capacity may be associated not only with increased demand but also with changes in accommodation costs, the structure of consumed services, the duration of stay, and the quality of the offer. Consequently, an analysis of natural indicators confirms a steady increase in domestic tourist activity, while value indicators simultaneously reflect market expansion and the influence of price and structural factors. At the third stage of the study, the dynamics of the

digital consumer environment in the Republic of Kazakhstan were assessed. The measurable indicators used are e-commerce metrics that reflect the adoption of remote mechanisms for searching, selecting, purchasing, and paying for goods and services.

Table 3 – Dynamics of e-commerce indicators in the Republic of Kazakhstan for 2021–2025.

Indicators	2021	2022	2023	2024	2025	Change 2025/2021
Retail e-commerce volume, billion tenge	482,0	1 963,5	2 439,8	3 156,4	3 768,8	+681.9%
The share of e-commerce in total retail trade volume, %	3,6	12,5	12,7	14,1	14,3	+10.7 pp
Retail e-commerce service volume, billion tenge	349,9	1 186,5	1 602,6	2 443,4	2 477,3	+608.0%
Note – compiled by the authors based on data from the Bureau of National Statistics of the Republic of Kazakhstan (2026d).						

The data in Table 3 show the intensive expansion of the digital segment of Kazakhstan's economy. The volume of retail e-commerce increased from 482.0 billion tenge in 2021 to 768.8 billion tenge in 2025, i.e., by almost 7.8 times. The share of e-commerce in the total volume of retail trade over the same period increased from 3.6% to 14.3%, i.e., by 10.7 percentage points.

The volume of e-commerce services increased from 349.9 billion tenge in 2021 to 2,477.3 billion tenge in 2025, representing a 608.0% increase. This indicator is of particular importance for the analysis of domestic tourism, since the digital services market includes transactions related to population mobility, the purchase of transportation and other services used to organise trips. At the same time, the most significant change in e-commerce indicators occurred between 2021 and 2022. It would be incorrect to interpret this surge solely as a result of actual growth in digital consumption, since the official statistical series from 2022 onwards accounts for marketplaces. Consequently, part of the observed change is due to the expansion of the statistical coverage.

After 2022, the digital segment continued to grow, though the pace of expansion slowed. This allows us to speak of a gradual transition from the initial widespread adoption of electronic channels to a stage in which the integration, quality, and functional complexity of digital services are becoming increasingly important.

For domestic tourism, such a transformation has direct functional significance. Digital technologies can accompany almost the entire trip organisation cycle: searching for information about a destination, comparing transport and hotel offers, booking, purchasing tickets, making payments, navigation, and obtaining information during the trip. Thus, the digital environment helps reduce information and transaction costs and expands the possibilities for independently organising domestic trips. A comparison of the dynamics of digital and tourism indicators demonstrates their simultaneous expansion. Between 2021 and 2025, the number

of resident visitors served by accommodation facilities increased by 68.3%, consumption related to domestic tourism increased by 251.7%, while the volume of e-commerce services grew by 608.0%.

However, the difference in growth scales and the limited time series do not allow us to interpret the joint dynamics as evidence of a direct cause-and-effect relationship. The results primarily indicate the development of a digital environment that grew in parallel with the expansion of the domestic tourism market.

The role of artificial intelligence requires special attention. Unlike basic digitalisation, the use of AI directly in Kazakhstan's tourism industry has not yet been supported by a comparable official statistical series for 2021–2025. Therefore, the independent quantitative effect of artificial intelligence on tourism demand is not assessed in this study. Taking this into account, it is proposed to distinguish between two interrelated levels of technological transformation in the tourism industry.

The first level is digital transformation, which has already reached a stage that enables quantitative assessment using statistical indicators of e-commerce, digital services, and consumer digital behaviour.

The second level is the intellectualisation of the tourism ecosystem, which characterises the ability of the established digital infrastructure and accumulated data to use artificial intelligence technologies for personalisation, forecasting, and automated interaction with tourists (Tussyadiah, 2020; Suanpang et al., 2024; López-Naranjo et al., 2025).

Based on empirical and theoretical analyses, an original model has been developed to describe the technological impact of digital technologies and artificial intelligence on the development of domestic tourism in the Republic of Kazakhstan.

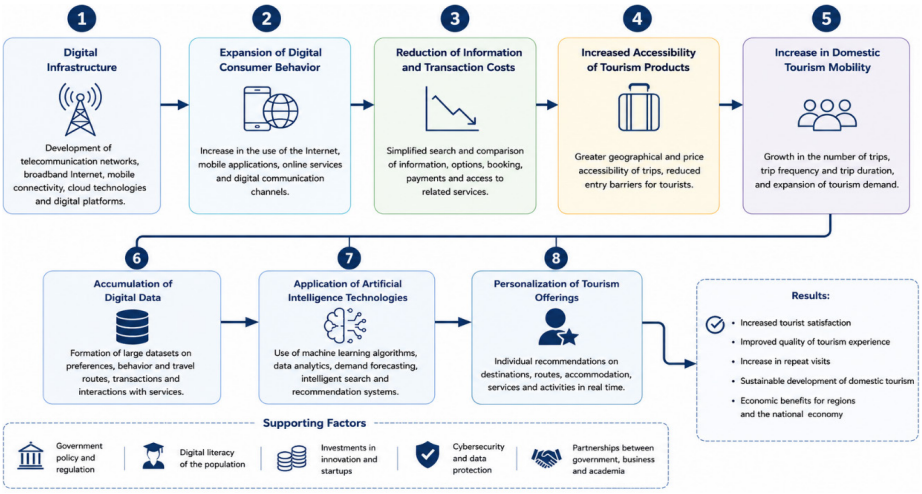

Figure 1 – Model of the technological impact of digital technologies and artificial intelligence on the development of domestic tourism

Note – developed by the authors.

The proposed model shows that the impact of technology on domestic tourism is consistent and multi-level. The primary element is the development of digital infrastructure, which creates conditions for the spread of digital consumer behaviour. The use of online services reduces the information and transaction costs associated with searching for, comparing, purchasing, and using tourism services. Reducing these costs can increase the accessibility of tourism products and expand the possibilities for independently organising trips. At the same time, digital interaction between consumers and service providers creates a body of data on search queries, preferences, bookings, routes, and consumer behaviour. It is the accumulation and structuring of such data that forms the technological basis for the next stage - the application of artificial intelligence. AI enables a shift from standard digital service to intelligent analysis of user preferences, demand forecasting, automated route planning, and personalisation of the tourism offer (Suanpang et al., 2024; López-Naranjo et al., 2025).

Thus, in the proposed model, artificial intelligence is not viewed as an autonomous factor independent of digitalisation, but as a subsequent stage in the development of the emerging digital tourism ecosystem. Overall, the research results show that during 2021–2025, domestic tourism in the Republic of Kazakhstan developed alongside the intensive transformation of the digital consumer environment. During the study period, the number of resident visitors increased by 68.3%, the gross value added directly generated in tourism increased by 201.2%, domestic tourist consumption increased by 251.7%, the volume of accommodation services increased by 221.6%, while e-commerce in services grew by 608.0%.

The identified synchrony provides empirical grounds for assuming a positive relationship between the development of the digital environment and domestic tourism activity. However, it is not sufficient to assert a direct causal effect. Verifying the nature and strength of such a relationship requires expanding the time series and developing a specialised system of indicators of the digital maturity of the tourism industry.

Discussion. The results indicate that the development of domestic tourism in the Republic of Kazakhstan in 2021–2025 coincided with the intensive transformation of the digital consumer environment. The growth of domestic tourist flows, tourist consumption, and the volume of accommodation services was accompanied by a significant expansion of e-commerce and remote channels for purchasing services. This synchrony allows us to consider digitalisation as one of the factors that are changing the conditions for the functioning of the domestic tourism market; however, it does not, in itself, prove a direct cause-and-effect relationship between the development of the digital environment and the growth of tourist activity.

This conclusion is consistent with modern studies on the digital transformation of tourism, in which digital technologies are viewed not only as tools for promoting and selling tourism services, but also as a factor driving structural changes

across the entire tourism value chain. Buhalis and Law (2008) showed that the development of information technologies consistently changes the mechanisms of interaction between tourism service providers and consumers. Later, the concept of smart tourism expanded this approach, linking digital transformation not to individual technological tools but to the formation of an integrated, data-driven environment based on digital platforms and the interaction among participants in the tourism ecosystem (Gretzel et al., 2015a; Gretzel et al., 2015b).

The results of the study, applied to Kazakhstan, confirm the need to consider the digital transformation of tourism more broadly than the spread of individual online services. The significant increase in e-commerce services, combined with the growth in domestic tourist flows, indicates the formation of a new consumer environment in which digital channels are gradually becoming part of the everyday mechanism for organising trips. This conclusion is consistent with the results of studies on Kazakhstan, which emphasise the growing role of internet technologies, e-commerce, and digital tools in the development of the tourism industry (Mussina et al., 2020; Amangozhayeva et al., 2022; Shilibekova, Plokhikh, 2025).

At the same time, the established dynamics do not allow us to assert that the growth of domestic tourism is solely due to digitalisation. Tourist demand is influenced by the population's income level, transport accessibility, travel costs, infrastructure quality, event activity, government support programs, and other economic and institutional factors. Therefore, in this study, digitalisation is considered an element of a broader mechanism for the development of domestic tourism, capable of reducing information and transaction costs and thereby expanding the possibilities for independently organising trips.

Particular attention should be paid to the identified difference between the growth rates of domestic tourist demand and the physical accommodation infrastructure. Between 2021 and 2025, the number of resident visitors served by accommodation facilities increased significantly faster than the number of accommodation facilities and their total capacity. At the same time, the number of bed-nights provided increased substantially. This ratio allows us to speak of an increase in the intensity of use of the existing infrastructure.

In this context, digital technologies can play an important functional role, as electronic booking, digital representation of facilities, platform services, and mobile applications can increase the informational accessibility of existing accommodation facilities and expand the channels for their interaction with potential consumers. Consequently, digital transformation can contribute not only to the creation of new tourism products but also to the more efficient use of existing infrastructure capacities.

At the same time, the results revealed a significant discrepancy between the dynamics of value-based and physical indicators in the tourism industry. The nominal volumes of tourism consumption, gross value added, and accommodation services grew significantly faster than the growth in the number of tourists and

in physical infrastructure. This means that an increase in value-based indicators should not be automatically interpreted as a similar expansion of the real volume of tourism activity.

The dynamics of the index of the physical volume of GVA in the tourism sector further confirm the need to account for the impact of the price factor. Consequently, it is advisable to assess the effectiveness of digital transformation not only by measuring increases in the industry's monetary turnover but also by tracking changes in actual tourist mobility, the intensity of infrastructure use, the availability of tourist products, and the quality of the tourist experience.

One of the key theoretical and methodological outcomes of the study is the differentiation between digitalisation and intellectualisation of the tourism industry. In several studies, these processes are examined within the framework of overall technological transformation; however, in the case of Kazakhstan, they are at different stages of maturity. Basic digitalisation has already become widespread and can be quantified using indicators of e-commerce, digital payments, and online services. By contrast, the use of artificial intelligence directly in the tourism industry has not yet been supported by comparable official statistics over a long period.

This distinction allows for a more precise definition of AI's role in the mechanism of domestic tourism development. Artificial intelligence should not be viewed as an autonomous technological factor affecting the tourism market, independent of the industry's level of digital maturity. The capabilities of recommendation systems, intelligent search, demand forecasting, and automated route planning directly depend on the availability of digital infrastructure and the accumulation of high-quality data on consumer behaviour (Tussyadiah, 2020; López-Naranjo et al., 2025).

It is this principle that underlies the proposed author's model. Unlike the linear view of technology's direct impact on the tourism flow, the model envisages a sequential chain of transformations: digital infrastructure expands digital consumer behaviour; the use of digital channels helps reduce information and transaction costs; cost reduction increases the accessibility of the tourism product; the expansion of digital interaction enables data accumulation; the resulting data sets form the basis for applying artificial intelligence; and AI, in turn, makes it possible to move to more personalised forms of tourism service.

This approach aligns with the development of the smart tourism ecosystem concept, in which data and interaction among participants are viewed as basic resources for creating additional tourist value (Gretzel et al., 2015b). The use of generative artificial intelligence further expands this model's capabilities by enabling the creation of individualised recommendations, routes, and travel scenarios in real time (Suanpang et al., 2024).

The results also align with studies linking the development of consumer-oriented artificial intelligence to the creation of phygital tourism experiences. Stankov et al.

(2025) show that integrating the physical travel space with smart mobile services creates the prerequisites for deeper, personalised interaction between tourists and the destination. For Kazakhstan, this approach may be particularly important due to the country's vast territory and the dispersed distribution of tourist facilities.

Personalised digital recommendations have the potential to expand the informational visibility of lesser-known tourist facilities and routes, reducing the excessive concentration of demand on a limited number of popular destinations. In the long term, this may contribute to a more even distribution of domestic tourist flows and the involvement of new territories and business entities in tourism activities. At the same time, at the current stage, this effect should be considered potential and require subsequent empirical verification.

From a practical point of view, the research results show that the further development of digital policy in the tourism sector should be focused not only on increasing the number of individual digital services. Ensuring their integration, data compatibility, and the ability to support tourists throughout the entire trip cycle - from choosing a destination and planning the route to booking, paying, and receiving services directly at the destination - becomes increasingly important.

The quality of the data takes on particular significance. The effectiveness of artificial intelligence technologies directly depends on the completeness, relevance, structure, and comparability of the information. Therefore, the further intellectualisation of the tourism industry should be accompanied by the development of data management mechanisms that ensure information security and protect personal information. This statement aligns with the findings of studies that emphasise the importance of ethical, institutional, and informational constraints on the use of AI in tourism (Tussyadiah, 2020; López-Naranjo et al., 2025).

An important condition for further digital and intelligent transformation is the readiness of the tourism sector enterprises themselves. The potential of artificial intelligence can only be realised if there are digitised business processes, qualified personnel, access to technological solutions, and the ability of organisations to integrate intelligent tools into existing service models. Consequently, the digital transformation of domestic tourism requires cooperation among the state, the tourism industry, technology companies, and the scientific and educational sectors.

When interpreting the results obtained, several limitations must be taken into account. Firstly, the study was conducted at the national level and does not reflect the territorial heterogeneity of digitalisation and tourism activity in individual regions of Kazakhstan. Secondly, the five-year time series limits the possibilities of applying complex econometric methods and establishing stable causality. Thirdly, official statistics have not yet formed a full-fledged time series directly characterising the use of artificial intelligence by tourism enterprises. Fourthly, e-commerce indicators are subject to changes in statistical accounting methodology, which requires caution when interpreting the dynamics.

These limitations simultaneously determine the directions for further research. It appears promising to expand the time horizon of analysis, develop an integrated Digital Tourism Index (DTI) to assess the digital maturity of the tourism environment, and create a system of AI-Tourism Readiness indicators to evaluate the tourism industry's readiness to adopt artificial intelligence.

As official statistics on the use of AI accumulate, it will become possible to move from assessing technological readiness to directly quantifying its impact on tourism demand, enterprise productivity, consumption patterns, and the quality of the tourism experience. This will make it possible to empirically test the mechanism proposed in this study and clarify the independent contributions of digitalisation and intellectualisation to the development of domestic tourism in the Republic of Kazakhstan.

Conclusion. The study identified the main trends in the development of domestic tourism in the Republic of Kazakhstan amid digital transformation and the growing use of artificial intelligence technologies. The analysis for 2021–2025 showed that the period under consideration was characterised by the simultaneous expansion of the tourism market, an increase in domestic tourism activity, and the intensive development of the digital consumer environment.

The results indicate a significant strengthening of the tourism industry's economic potential. The gross value added generated directly in the tourism sector increased from 572.5 billion tenge in 2021 to 1,724.45 billion tenge in 2025, i.e., by 201.2%, and its share in GDP rose from 0.7% to 1.15%. Consumption related to domestic tourism increased from 1,130.8 to 3,977.2 billion tenge, a 251.7% increase. At the same time, the number of resident visitors served by accommodation facilities increased from 5.15 to 8.66 million, a 68.3% increase. This dynamic allows us to characterise the development of domestic tourism as a stable medium-term trend rather than a short-term post-pandemic recovery.

At the same time, a certain asymmetry has been identified between the dynamics of tourist demand and the expansion of physical infrastructure. With a 68.3% increase in the domestic tourist flow, the number of accommodation facilities increased by 21.6%, and their simultaneous capacity increased by 20.7%. The number of beds provided over the same period grew by 61.6%. This indicates an increase in the intensity of use of existing infrastructure and underscores the need to consider not only the extensive expansion of the material base but also the effectiveness of managing existing tourism resources.

At the same time, a large-scale transformation of the digital consumer environment was taking place. The volume of retail e-commerce increased almost 7.8-fold, and the volume of e-commerce services increased more than sevenfold. The share of e-commerce in the total volume of retail trade grew from 3.6% to 14.3%. These changes indicate the spread of remote mechanisms for searching for, selecting, purchasing, and paying for goods and services, and the formation of an environment in which digital channels are becoming a familiar element of consumer behaviour.

For domestic tourism, digitalisation is of particular importance, as it covers almost the entire trip organisation cycle - from searching for information about a destination and comparing options to booking, paying, navigating, and receiving related services. As a result, digital technologies help reduce information and transaction costs and increase the accessibility of the tourism product. This conclusion aligns with modern concepts of digital and smart tourism, within which data, digital platforms, and service integration are viewed as the foundation for shaping a new tourism ecosystem (Buhalis, Law, 2008; Gretzel et al., 2015a; Gretzel et al., 2015b).

At the same time, the identified synchrony between the growth of digital indicators and domestic tourism activity does not allow us to automatically conclude that digitalisation is the sole or direct cause of the growth in tourism demand. Domestic tourism is developing under the influence of several factors, including the population's income level, transport accessibility, travel costs, infrastructure quality, the institutional environment, and government support measures. Furthermore, the five-year time series limits the possibilities for a statistically robust assessment of causal relationships. Thus, the study's results confirm the existence of prerequisites and a mechanism through which digitalisation influences domestic tourism. However, they do not allow us to infer a proven causal relationship from synchronous dynamics.

One of the main theoretical and methodological outcomes of the study was the delineation of the concepts of digitalisation and intellectualisation of the tourism industry. It has been established that digitalisation in Kazakhstan has already formed a technological and informational foundation that can be quantitatively assessed using official statistical indicators. The use of artificial intelligence directly in tourism activities, by contrast, is at an earlier stage of development and is not yet supported by a comparable statistical series for 2021–2025. In this regard, a quantitative assessment of the independent impact of artificial intelligence on the domestic tourist flow at this stage appears premature. It is advisable to view AI as the next stage in the development of the already established digital environment, based on the accumulation and use of data. Modern research links its potential primarily to the personalisation of the tourism offer, intelligent search, demand forecasting, automated route planning, and the adaptation of services to users' individual preferences (Tussyadiah, 2020; Suanpang et al., 2024; López-Naranjo et al., 2025; Stankov et al., 2025).

Within the framework of the study, an author's model of the technological impact of digital technologies and artificial intelligence on the development of domestic tourism is proposed. Its fundamental difference lies in the presentation of technological transformation as a sequential process: the development of digital infrastructure contributes to the spread of digital consumer behavior; digital channels reduce information and transaction costs; increasing the availability of tourism products creates prerequisites for expanding tourist mobility; digital

interaction generates a data array; the accumulated data form the basis for the subsequent application of artificial intelligence; the use of AI ensures a transition to intelligent analysis, forecasting, and personalized tourism offerings.

Thus, artificial intelligence is not viewed as an isolated factor operating independently of the level of digitalisation, but rather as a higher stage in the development of the digital tourism ecosystem. This approach aligns with the concept of a smart tourism ecosystem, in which data, digital infrastructure, and participant interactions serve as the basic conditions for creating additional tourism value (Gretzel et al., 2015b).

The practical significance of the results obtained lies in the need to move from the fragmented digitalisation of individual tourism services to the formation of an integrated digital ecosystem for domestic tourism in Kazakhstan. Priority areas may include increasing the interconnectivity of digital services, ensuring the quality and compatibility of tourism data, developing intelligent recommendation systems and automated route planning, digital transformation of tourism sector enterprises, enhancing employees' digital competencies, and ensuring information security. Implementing this approach requires coordinated interaction among the state, the tourism industry, technology companies, and the scientific and educational sectors. The development of data infrastructure is of particular importance, as the effectiveness of subsequent artificial intelligence implementation directly depends on the quality, completeness, and structure of digital information.

The study has several limitations. Firstly, the analysis was conducted at the national level and does not reflect regional differences in digitalisation and tourism activity. Secondly, the limited duration of the time series does not allow for the use of complex econometric models with sufficient statistical stability. Thirdly, official data currently do not allow for the construction of a full-fledged time series on the direct use of artificial intelligence by tourism enterprises. Fourthly, certain e-commerce indicators are subject to changes in statistical coverage, which requires caution when interpreting the dynamics. The prospects for further research lie in expanding the observation time horizon and improving quantitative tools for assessing the digital transformation of tourism. It seems advisable to develop an integrated Digital Tourism Index (DTI) to assess the level and dynamics of the digital maturity of the tourism environment, as well as to create a system of AI-Tourism Readiness indicators to measure the tourism industry's readiness for the broader adoption of artificial intelligence. As official statistical data accumulate, a promising area will be the econometric assessment of the independent impact of artificial intelligence technologies on tourist demand, the frequency and duration of trips, enterprise productivity, and the quality of the tourist experience. This will make it possible to empirically verify the mechanism proposed in the work and to more accurately determine the contribution of digitalisation and intellectualisation to the development of domestic tourism in the Republic of Kazakhstan.

Overall, the research results show that the further development of domestic

tourism in Kazakhstan is no longer determined solely by the expansion of physical infrastructure, but also by the industry's ability to transform the accumulated digital potential into more effective and personalised forms of interaction with consumers. The transition from the digitalisation of individual operations to an integrated, data-driven, and AI-ready tourism ecosystem could become one of the key areas for enhancing the accessibility, competitiveness, and sustainability of the country's domestic tourism.

References

Amangozhayeva A., Petrichsheva N., Pralieva S. (2022) Trends in digitalisation and development of e-commerce in the field of service and tourism in the Republic of Kazakhstan. Economic Series of the Bulletin of L.N. Gumilyov ENU, 4. — P. 272–279. https://doi.org/10.32523/2789-4320-2022-4-272-279 (in Eng.).

Buhalis D., Law R. (2008) Progress in information technology and tourism management: 20 years on and 10 years after the Internet — The state of eTourism research. Tourism Management, 29(4). — P. 609–623. https://doi.org/10.1016/j.tourman.2008.01.005 (in Eng.).

Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan (2026a) Vspomogatel'nyy schet turizma Respubliki Kazakhstan [Tourism Satellite Account of the Republic of Kazakhstan]. Astana. Available at: Bureau of National Statistics of Kazakhstan (in Russian).

Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan (2026b) Statistika turizma: dinamicheskie tablitsy [Tourism statistics: Dynamic tables]. Astana. Available at: Bureau of National Statistics of Kazakhstan (in Russian).

Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan (2026c) Osnovnye pokazateli deyatel'nosti mest razmeshcheniya v Respublike Kazakhstan. Yanvar'–dekabr' 2025 goda [Main indicators of accommodation facilities in the Republic of Kazakhstan. January–December 2025]. Astana. Available at: Bureau of National Statistics of Kazakhstan (in Russian).

Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan (2026d) Elektronnaya kommertsiya v Respublike Kazakhstan [E-commerce in the Republic of Kazakhstan]. Astana. Available at: Bureau of National Statistics of Kazakhstan (in Russian).

Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan (2026e) Raskhody domashnikh khozyaystv na poezdki v Respublike Kazakhstan [Household expenditures on travel in the Republic of Kazakhstan]. Astana. Available at: Bureau of National Statistics of Kazakhstan (in Russian).

Gretzel U., Sigala M., Xiang Z., Koo C. (2015a) Smart tourism: Foundations and developments. Electronic Markets, 25. — P. 179–188. https://doi.org/10.1007/s12525-015-0196-8 (in Eng.).

Gretzel U., Werthner H., Koo C., Lamsfus C. (2015b) Conceptual foundations for understanding smart tourism ecosystems. Computers in Human Behavior, 50. — P. 558–563. https://doi.org/10.1016/j.chb.2015.03.043 (in Eng.).

Kulakhmetova R., Sultangaliyev A., Kulakhmetova G. (2024) Digitalization of tourism objects as a tool for the development of cultural tourism in Kazakhstan. Scientific Herald of Uzhhorod University. Series Physics, 56. — P. 573–580. https://doi.org/10.54919/physics/56.2024.57vef3 (in Eng.).

Li Y., Hu C., Huang C., Duan L. (2017) The concept of smart tourism in the context of tourism information services. Tourism Management, 58. — P. 293–300. https://doi.org/10.1016/j.tourman.2016.03.014 (in Eng.).

López-Naranjo A.L., Puente-Ríofrío M.I., Carrasco-Salazar V.A., Erazo-Rodríguez J.D. (2025) Artificial intelligence in the tourism business: A systematic review. Frontiers in Artificial Intelligence, 8. — Article 1599391. https://doi.org/10.3389/frai.2025.1599391 (in Eng.).

Ministry of Tourism and Sports of the Republic of Kazakhstan, Committee of Tourism Industry (2025) Tsifrovizatsiya turisticheskoy otrasli Respubliki Kazakhstan [Digitalisation of the tourism industry of the Republic of Kazakhstan]. Astana. (in Russian).

Mussina K.P., Mamrayeva D.G., Lemanowicz M. (2020) Digitalization in the tourism industry of Kazakhstan. Bulletin of the Karaganda University. Economy Series, 99(3). — P. 64–72. https://doi.org/10.31489/2020ec3/64-72 (in Eng.).

National Bank of the Republic of Kazakhstan (2025) Statistika po platezhnym kartochkam i beznalichnym operatsiyam [Statistics on payment cards and cashless transactions]. Almaty. Available at: National Bank of Kazakhstan (in Russian).

Shilibekova B., Plokhikh R. (2025) Assessing readiness and breaking barriers to tourism digitalisation: A case study of Kazakhstan. Economic Series of the Bulletin of L.N. Gumilyov ENU, 2. — P. 365–385. https://doi.org/10.32523/2789-4320-2025-2-365-385 (in Eng.).

Stankov U., Filimonau V., Gretzel U., Vujičić M.D. (2025) The rise of the smartphygital tourist: Implications of consumer AI for phygital tourism experiences. Information Technology & Tourism, 27(2). (in Eng.).

Suanpang P., Jamjuntr P., Jermsittiparsert K., Kaewyong P., Niamsorn C. (2024) The integration of generative artificial intelligence and Internet of Things technologies for sustainable smart tourism destinations. Sustainability, 16(17). — Article 7435. (in Eng.).

Tussyadiah I.P. (2020) A review of research into automation in tourism: Launching the Annals of Tourism Research Curated Collection on Artificial Intelligence and Robotics in Tourism. Annals of Tourism Research, 81. — Article 102883. https://doi.org/10.1016/j.annals.2020.102883 (in Eng.).

World Tourism Organization (2010) Tourism Satellite Account: Recommended Methodological Framework 2008. Madrid: UNWTO. (in Eng.).

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