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SPACE-LAUNCH TOURISM AT BAIKONUR AND DIGITALISATION IN THE STRATEGIC DEVELOPMENT OF KAZAKHSTAN'S HOSPITALITY SECTOR

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Space-launch tourism at Baikonur and digitalisation in the strategic development of Kazakhstan's hospitality sector

Abstract. The relevance of the study is determined by the need to diversify Kazakhstan's hospitality sector through digital transformation and specialised tourism products based on unique national resources. The purpose of the article is to assess the role of digitalisation and space-launch tourism at Baikonur in the strategic development of Kazakhstan's hospitality sector. The study applies a descriptive and analytical desk research design based on secondary data, including official statistics for 2011-2025, scientific literature, industry materials and documented cases of attendance at space launches. The results show positive dynamics in Kazakhstan's accommodation sector: in 2025, 4,482 accommodation facilities served 10,087.1 thousand visitors, with a one-time capacity of 232.9 thousand bed-places. Scenario estimates indicate that organised attendance at Baikonur space launches may attract 5,000-12,500 visitors annually under conservative assumptions. The scientific novelty lies in integrating hospitality development, digital tools and Baikonur-based space-launch tourism into a single analytical framework. The practical significance is reflected in recommendations for infrastructure modernisation, digital visitor management, safety regulation and the development of culturally meaningful tourism products based on Kazakh hospitality traditions.

Key words: hospitality sector, Kazakhstan, Baikonur, digitalisation, space-launch tourism, accommodation facilities, destination management.

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Байқоңырдағы ғарыштық ұшыру туризмі және цифрландыру Қазақстанның қонақжайлылық секторын стратегиялық дамыту бағытында

Аңдатпа. Зерттеудің өзектілігі Қазақстанның қонақжайлылық секторын цифрлық трансформация және ұлттық бірегей ресурстарға негізделген мамандандырылған туристік өнімдер арқылы ертартапандыру қажеттілігімен айқындалады. Мақаланың мақсаты - Байқоңырдағы ғарыштық ұшыру туризмі мен цифрландырудың Қазақстанның қонақжайлылық секторын стратегиялық дамытудағы рөлін бағалау. Зерттеу 2011-2025 жылдардағы ресми статистикалық деректерге, ғылыми әдебиеттерге, салалық материалдарға және ғарыштық ұшыруларға қатысу жөніндегі құжатталған мәліметтерге негізделген сипаттамалық-талдамалық кабинеттік зерттеу ретінде жүргізілді. Нәтижелер Қазақстанның орналастыру секторында оң серпін бар екенін көрсетті: 2025 жылы 4 482 орналастыру орны 10 087,1 мың келушіге қызмет көрсетіп, біржолғы сыйымдылығы 232,9 мың төсек-орынды құрады. Сценарийлік бағалаулар консервативті болжамдар жағдайында Байқоңырдағы ғарыштық ұшыруларға ұйымдастырылған қатысу жылына 5 000-12 500 келушіні тартуы мүмкін екенін көрсетті. Зерттеудің ғылыми жаңалығы қонақжайлылық дамуын, цифрлық құралдарды және Байқоңырдағы ғарыштық ұшыру туризмін біртұтас талдамалық шеңберде қарастырумен сипатталады. Практикалық маңыздылығы инфрақұрылымды жаңғырту, келушілерді цифрлық басқару, қауіпсіздік талаптарын реттеу және қазақ қонақжайлылығы дәстүріне негізделген туристік өнімдерді дамыту бойынша ұсыныстарда көрініс табады.

Түйін сөздер: қонақжайлылық секторы, Қазақстан, Байқоңыр, цифрландыру, ғарыштық ұшыру туризмі, орналастыру орындары, дестинацияны басқару.

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Туризм космических запусков на Байконуре и цифровизация в стратегическом развитии сектора гостеприимства Казахстана

Аннотация. Актуальность исследования определяется необходимостью диверсификации сектора гостеприимства Казахстана посредством цифровой трансформации и развития специализированных туристских продуктов, основанных на уникальных национальных ресурсах. Цель статьи – оценить роль цифровизации и туризма космических запусков на Байконуре в стратегическом развитии сектора гостеприимства Казахстана. Исследование выполнено в формате описательно-аналитического кабинетного исследования на основе вторичных данных, включая официальную статистику за 2011-2025 годы, научную литературу, отраслевые материалы и документально подтвержденные случаи посещения космических запусков. Результаты показывают положительную динамику сектора размещения Казахстана: в 2025 году 4

482 места размещения обслужили 10 087,1 тыс. посетителей, а единовременная вместимость составила 232,9 тыс. койко-мест. Сценарные оценки показывают, что организованное посещение космических запусков на Байконуре при консервативных предпосылках может привлекать 5 000-12 500 посетителей в год. Научная новизна заключается в интеграции развития гостеприимства, цифровых инструментов и туризма космических запусков на Байконуре в единую аналитическую рамку. Практическая значимость выражается в рекомендациях по модернизации инфраструктуры, цифровому управлению посетителями, регулированию безопасности и развитию культурно значимых туристских продуктов на основе традиций казахского гостеприимства.

Ключевые слова: сектор гостеприимства, Казахстан, Байконур, цифровизация, туризм космических запусков, места размещения, управление дестинацией.

Introduction. At the present stage, the hospitality sector is one of the important areas of socio-economic development, since it directly influences the quality of tourist experience, the competitiveness of destinations and the diversification of regional economies. For Kazakhstan, the strategic development of hospitality is associated not only with the expansion of accommodation and catering services, but also with the search for specialised tourism products based on national identity, digital transformation and unique territorial resources. In this context, Baikonur occupies a special place, as it combines scientific, technological, historical and symbolic significance for the country.

Kazakhstan has a distinctive advantage due to the presence of the Baikonur Cosmodrome, one of the most historically significant and internationally recognised space launch sites in the world. Its value for tourism is determined not only by its technological role, but also by its symbolic association with the beginning of the human space era. This creates a basis for developing a specialised tourism product focused on attendance at space launches, scientific excursions, museum routes and educational-cultural programmes. At the same time, the tourism potential of Baikonur cannot be realised separately from the hospitality sector, since visitors require accommodation, catering, transport coordination, safety procedures, digital information support and destination-level management.

The cultural foundation of Kazakh hospitality gives additional value to this direction. In the Kazakh worldview, respectful reception of a guest has traditionally been perceived not merely as a household practice, but also as a moral and social norm. The traditions of «sәлемdesu» and «amandasu», seating the guest in the place of honour («tör»), laying the «aq дастарқан», offering water for handwashing and giving «sarqyt» reflect a historically formed culture of care, generosity and respect for the visitor. As noted in historical descriptions, Kazakhs were distinguished by warmth, friendliness and hospitality, which were deeply rooted in their way of life [1]. Therefore, the development of tourism and hospitality in Kazakhstan should be based not

only on infrastructure and technology, but also on the cultural code of Kazakh guest reception.

The global development of space-related tourism also demonstrates that modern visitors increasingly seek unique, meaningful and emotionally memorable experiences. The appeal of space hospitality lies in its ability to offer an exceptional experience associated with scientific progress, the observation of launch events and symbolic participation in the history of space exploration. International experience shows that the commercialisation of space-related activities and the involvement of private companies have expanded the understanding of tourism beyond traditional leisure formats and strengthened the role of hospitality in supporting new types of visitor experience [2, 3]. However, for Kazakhstan, the most realistic near-term direction is not mass orbital tourism, but the development of organised attendance at launches, scientific tourism and cultural-technological routes connected with Baikonur and the Kyzylorda region.

In this study, the hospitality industry is understood as an integrated service system that combines accommodation, catering, transport, digital services and destination-level visitor experience management. This interpretation is based on the understanding of hospitality both as a cultural practice of respectful guest reception and as a managerial system aimed at satisfying visitor needs. Such an approach is particularly relevant for Baikonur, where tourism development requires not only access to space-launch events, but also service coordination, transport logistics, digital information tools, safety procedures and cultural interpretation.

In the conditions of digitalisation, the hospitality sector is undergoing a qualitative transformation. Online booking systems, virtual tours, mobile applications, digital payment systems, personalised services and data-based destination management are changing the interaction between tourists, hospitality enterprises and public authorities. These tools make it possible to improve the convenience of travel planning, reduce information barriers, increase service transparency and adapt tourism products to the needs of different visitor segments.

For Baikonur, digital tools are especially important because attendance at space launches depends on advance planning, regulated access, transport coordination, safety requirements and reliable communication with visitors.

Scientific problem and research gaps. Research on hospitality has developed across several interconnected directions, including the nature of hospitality services, the competitiveness of accommodation enterprises, service quality, visitor experience and the role of digital technologies in destination management. In the context of this study, hospitality is considered not only as a set of accommodation and catering services, but also as an integrated system of guest reception, service coordination and experience management [4, 5]. However, existing studies and descriptive materials do not sufficiently integrate three dimensions that are important for Kazakhstan: the current development of the national hospitality sector, the role of digitalisation in improving service competitiveness, and the potential of Baikonur-based space-launch attendance as a specialised tourism product.

Despite the relevance of this topic, existing studies and descriptive materials do not sufficiently integrate three important dimensions: the current development of Kazakhstan's hospitality sector, the role of digitalisation in improving service competitiveness, and the potential of Baikonur-based space-launch attendance as a specialised tourism product. Most studies on Baikonur focus either on the historical and technological significance of the cosmodrome or on general prospects for space tourism. Insufficient attention has been paid to the connection between attendance at space launches, digital tools and the development of the hospitality sector. This creates a research gap in terms of how digital tools and Baikonur's unique space heritage can be used together for the strategic development of Kazakhstan's hospitality sector.

Purpose of the study. The purpose of this article is to assess the role of digitalisation and attendance at space launches at Baikonur in the strategic development of Kazakhstan's hospitality sector.

Objectives of the study. To achieve this purpose, the study sets the following objectives: to analyse the current development dynamics of Kazakhstan's hospitality sector; to identify the role of digital tools in improving the competitiveness of accommodation enterprises and tourism destinations; to assess the potential of Baikonur-based attendance at space launches as a specialised tourism product; to determine the infrastructure, organisational, regional and safety conditions required for the development

of Baikonur as a tourism destination; and to formulate practical recommendations for integrating digitalisation and space-launch tourism into the strategic development of Kazakhstan's hospitality sector.

Thus, the article links Kazakhstan's hospitality dynamics, digitalisation and the tourism potential of Baikonur within a single analytical framework. This approach makes it possible to consider space-launch tourism not as a speculative mass-tourism direction, but as a specialised and gradually developing tourism product based on cultural identity, technological heritage, regional accessibility, digital management and high-quality guest reception.

Materials and methods. The research design is based on a descriptive and analytical desk study using secondary data. This design was selected because the article aims to assess the strategic role of digitalisation and attendance at space launches at Baikonur in the development of Kazakhstan's hospitality sector without conducting primary field surveys. The study combines theoretical generalisation, statistical interpretation and scenario-based assessment.

The empirical basis of the research includes official statistical data of the Bureau of National Statistics of the Republic of Kazakhstan for 2011-2025, scientific publications on hospitality management, hotel competitiveness, digital tourism and space-related tourism, as well as official and industry materials on attendance at individual space launches at Baikonur. The analytical focus is placed on Kazakhstan's hospitality sector, accommodation enterprises, digital service tools and documented visitor attendance at selected launch events.

The sample is not based on a sociological survey, since no questionnaires or interviews were conducted. Instead, the study uses a documentary and statistical sample formed from open secondary sources. The main units of analysis are accommodation facilities in Kazakhstan, hotel enterprises with and without restaurant services, digital tools used in hospitality and tourism, and launch events at Baikonur that were open to visitors. This approach makes it possible to assess the topic at the sectoral and destination levels.

Several research methods were applied. The descriptive method was used to characterise the current state and development dynamics of the hospitality sector. Comparative analysis was used to compare hotels with and without restaurant services and to identify differences in their economic contribution. Content analysis of scientific and industry sources was applied to

summarise approaches to hospitality, digital tourism and space-related tourism. Scenario analysis was used to estimate possible annual attendance at space launches at Baikonur under conservative assumptions.

The data analysis procedure consisted of several stages. First, the official statistical indicators for 2011-2025 were systematised, including the volume of hotel services, the number of accommodation facilities, the number of visitors served and one-time accommodation capacity. Second, the role of digital tools was analysed in relation to online booking, virtual tours, personalised services, mobile applications, digital visitor registration and data-based destination management. Third, documented cases of attendance at space launches were used to develop illustrative scenarios for Baikonur. The scenario estimates were calculated by multiplying the number of launches potentially open to tourists by the average number of visitors per launch.

The analytical toolkit of the study includes time-series interpretation, comparative sectoral analysis, structured content analysis and scenario modelling. The scenario model is not intended to provide an exact forecast; it is used to demonstrate possible orders of magnitude for visitor flows and to support strategic planning. In this regard, the results should be interpreted as an analytical basis for policy, investment and destination-management decisions rather than as a final economic forecast.

The main limitation of the study is its reliance on secondary data and the absence of direct surveys with tourists, hotel operators, tour companies and local authorities. Therefore, further research should include primary data collection, expert interviews, visitor surveys, capacity modelling of launch-viewing sites and cost-benefit analysis of infrastructure projects in the Baikonur-Kyzylorda corridor.

Results. Accommodation is one of the core components of the tourism product, since the capacity, quality and accessibility of lodging services directly determine the ability of a destination to receive tourists and generate sustainable economic returns. In the hospitality system, accommodation should not be considered as an isolated service, but as a structural element connected with catering, transport, cultural interpretation, safety, digital communication and visitor experience management [5]. In the Kazakh context, this functional role of accommodation is strengthened by the national tradition of hospitality, where respectful reception of a guest is historically understood not only as a service practice, but also as a cultural and ethical value.

The statistical dynamics of Kazakhstan's hotel and accommodation sector demonstrate a generally positive trajectory over the period 2011-2025. According to official data, the volume of services provided by hotel enterprises increased steadily over the long period under review, with a temporary decline during the COVID-19 period and subsequent recovery. In the hotel segment, the highest previously recorded value was observed in 2024, when the volume of services provided by hotels with restaurants reached 229,248 million tenge. Compared with 2011, the overall growth of hotel services was almost fivefold. At the same time, hotels without restaurant services remained a considerably smaller segment; in 2024, their volume of services was almost 15 times lower than that of hotels with restaurants. The positive dynamics continued in 2025. In January-December 2025, Kazakhstan recorded 4,482 accommodation facilities, which served 10,087.1 thousand visitors, while their one-time capacity reached 232.9 thousand bed-places [6].

These indicators confirm that the post-pandemic recovery of the accommodation sector continued beyond 2024 and that the hospitality infrastructure of Kazakhstan is expanding not only in terms of service volume, but also in terms of visitor capacity and market coverage.

Regional tourism context of the Baikonur-Kyzylorda area. Since Baikonur is geographically and functionally connected with the Kyzylorda region, the regional tourism context is important for assessing the practical feasibility of space-launch tourism. The development of Baikonur-related tourism depends not only on the uniqueness of the cosmodrome, but also on the capacity of the wider regional system to provide accommodation, transport, catering, information support and visitor safety.

In the national accommodation system, Kazakhstan recorded 4,482 accommodation facilities, 10,087.1 thousand visitors served and a one-time capacity of 232.9 thousand bed-places in January-December 2025 [6]. Against this national background, the Baikonur-Kyzylorda area should be considered as a specialised regional destination rather than as a mass-tourism centre. Available regional information indicates a growing interest in tourism products in Kyzylorda region, which confirms the relevance of strengthening the hospitality infrastructure around Baikonur.

The regional position of Baikonur creates both opportunities and constraints. On the one hand, the cosmodrome gives the region a unique

tourism identity based on space heritage, scientific interpretation and launch-related events. On the other hand, the restricted access regime, dependence on the Kyzylorda-Baikonur transport corridor, limited accommodation capacity and uneven service standards reduce the possibility of spontaneous mass visitation. Therefore, the regional statistics should be interpreted not as evidence of immediate mass-tourism potential, but as an indication of the need for gradual development of accommodation capacity, digital visitor management and coordinated destination planning.

This regional context shows that Baikonur-related tourism can contribute to the diversification of the Kyzylorda region's tourism economy if it is developed as a controlled and event-based tourism product. The key task is to connect the cosmodrome's symbolic value with the regional hospitality system, including hotels, guest services, transport operators, digital platforms and safety mechanisms.

For a clearer interpretation of the main trends, the key indicators of Kazakhstan's hospitality sector are summarised in Table 1.

Table 1 – Key indicators of the development of Kazakhstan's hospitality sector, 2011-2025

Indicator	Observed trend	Key value / result	Analytical interpretation
Volume of services provided by hotels with restaurants	Stable long-term growth with a short pandemic-related decline	229,248 million tenge in 2024	Full-service hotel formats form the dominant part of the sector and have stronger revenue potential
Volume of services provided by hotels without restaurants	Growth remains significantly lower than in the full-service segment	Almost 15 times lower than hotels with restaurants in 2024	Limited-service accommodation remains important, but its economic contribution is structurally weaker
Total hotel service volume	Long-term positive dynamics	Almost fivefold growth in 2024 compared with 2011	The sector shows progressive expansion and increasing economic relevance
Number of accommodation facilities	Continued infrastructure expansion	4,482 accommodation facilities in January-December 2025	The accommodation base continued to expand after the post-pandemic recovery
Visitors served by accommodation facilities	Growth in demand for accommodation services	10,087.1 thousand visitors in January-December 2025	Visitor flows confirm the increasing role of accommodation services in Kazakhstan's tourism economy
One-time capacity of accommodation facilities	Expansion of reception capacity	232.9 thousand bed-places in January-December 2025	The sector's physical capacity creates a basis for further tourism development
Crisis sensitivity	Temporary decline during the pandemic period	COVID-19 caused short-term contraction	The sector remains vulnerable to shocks and requires risk management mechanisms
Source - compiled by the authors based on [5-9].			

Table 1 shows that the development of Kazakhstan's hospitality sector is not limited to quantitative growth in service volumes. The structure of the market is also changing: full-service accommodation enterprises, especially hotels with restaurants, concentrate a larger share of service value. At the same time, the 2025 indicators demonstrate the continued expansion of the accommodation base, visitor flow and reception capacity. This is important for the strategic development of the hospitality sector, since future tourism products connected with Baikonur will require not only lodging capacity, but also catering, transport coordination, event management

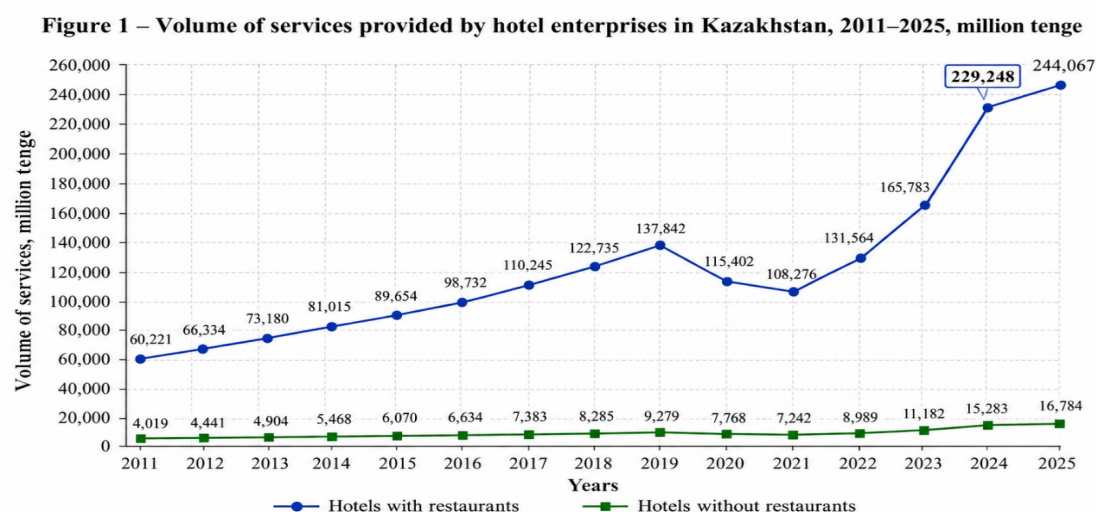
and digital information support. For analytical purposes, the Baikonur-Kyzylorda area should be considered as a specialised corridor-type destination, where the attractiveness of the cosmodrome is closely linked with regional hospitality infrastructure. The development of space-launch tourism depends on the coordination of several elements: visitor access, accommodation supply, transport services, digital communication, safety regulation and regional tourism management. Table 2 systematises the main components that determine the position of the Baikonur-Kyzylorda area in the development of space-launch tourism.

Table 2 – Regional positioning of the Baikonur-Kyzylorda area in the development of space-launch tourism

Analytical component	Regional characteristic	Importance for Baikonur-related tourism
Geographical position	Baikonur is located in the south-western part of Kazakhstan and is functionally connected with Kyzylorda region	Determines transport accessibility and the need for organised visitor logistics
Destination type	Specialised event-based destination related to space launches and scientific tourism	Requires planning according to launch schedules rather than continuous mass visitation
Regional tourism flow	Kyzylorda region demonstrates growing interest in tourism products	Creates a basis for linking Baikonur with regional tourist routes
Accommodation capacity	Accommodation supply in Baikonur remains limited and uneven in-service quality	Requires modernisation of hotels and development of mid-range accommodation
Transport corridor	Visitor access largely depends on the Kyzylorda–Baikonur route	Requires improvement of road transport, transfers and digital navigation
Digital support	Launch attendance requires advance information, registration and coordination	Supports safer and more predictable visitor management
Strategic role	Baikonur can strengthen the regional tourism identity of Kyzylorda region	Contributes to diversification of Kazakhstan's hospitality sector
Source - compiled by the authors based on [6, 10-12].		

Kazakhstan has a distinctive advantage due to the location of the Baikonur Cosmodrome, one of the oldest and most recognized space launch sites in the world. The dynamics of hotel service volume for the period 2011-2025 are presented in Figure 1. The figure is designed as a line chart with two main

series – hotels with restaurants and hotels without restaurants. Where aggregate accommodation data for 2025 are used, they should be clearly marked as accommodation-facility indicators rather than a direct continuation of the hotel-with-restaurant category.



Source: Compiled by the authors based on the Bureau of National Statistics [6].

Interpretation: The figure demonstrates long-term sectoral growth, a short pandemic-related decline, recovery after COVID-19, and continuation of positive dynamics in 2025. The gap between hotels with and without restaurant services confirms the stronger economic role of full-service hospitality formats.

Figure 1 – Volume of services provided by hotel enterprises in Kazakhstan, 2011-2025, million tenge (Source - compiled by the author based on the data from the Bureau of National Statistics [6])

The Figure 1 demonstrates long-term sectoral growth, a short pandemic-related decline, recovery after COVID-19 and continuation of positive dynamics in 2025. The gap between hotels with and without restaurant services confirms the stronger economic role of full-service hospitality formats. The number of accommodation facilities also increased noticeably (Figure 2).

This trend reflects the gradual expansion of the sector and the growing importance of hospitality services in the national tourism economy. However, quantitative growth alone does not guarantee competitiveness. The development of accommodation enterprises should be accompanied by improvements in service quality, digital readiness, staff training and integration with regional tourism products.



Source: Compiled by the authors based on the Bureau of National Statistics [6].

Interpretation: The figure shows the expansion of accommodation infrastructure. In 2025, Kazakhstan recorded 4,482 accommodation facilities, which confirms the continued strengthening of the hospitality sector after the pandemic period and highlights the importance of service standardisation and regional balance.

Figure 2 – Growth in the number of accommodation facilities in Kazakhstan, 2018-2025
(Source - compiled by the authors based on the Bureau of National Statistics [6])

The Figure 2 shows the expansion of accommodation infrastructure. In 2025, Kazakhstan recorded 4,482 accommodation facilities, which confirms the continued strengthening of the hospitality sector after the pandemic period and highlights the importance of service standardisation and regional balance.

Regional tourism statistics of the Baikonur-Kyzylorda tourism area. In order to assess the practical potential of Baikonur space-launch tourism, it is necessary to consider not only national indicators, but also the regional tourism context of the analysed area. Baikonur is geographically and functionally connected with the Kyzylorda region; therefore, the tourism development of Baikonur depends on the accommodation capacity, transport accessibility and service infrastructure of this region. The Baikonur-Kyzylorda corridor performs the role of the main access route for visitors attending launch-related events, since many tourists arrive through Kyzylorda and then continue their trip to Baikonur.

According to the Bureau of National Statistics, the Kyzylorda region recorded 158 accommodation facilities in 2025, which accounted for 3.5 % of the total number of accommodation facilities in Kazakhstan. The number of visitors served by accommodation facilities in the region reached 212.3 thousand people, representing 2.1 % of the national indicator. The one-time capacity of accommodation facilities in the region was 5.0 thousand bed-places, or 2.2 % of the total accommodation capacity of Kazakhstan. The volume of accommodation services in the Kyzylorda region amounted to 3,288.3 million tenge, which represented 0.9 % of the national volume. These figures show the current scale of the regional hospitality infrastructure and make it possible to assess the readiness of the region to support specialised tourism products connected with Baikonur.

The regional share is calculated according to the following formula:

Regional share = regional indicator / national indicator × 100 %.

For example, the number of accommodation facilities in the Kyzylorda region was compared with the national total of 4,482 accommodation facilities in 2025. The resulting share of 3.5 % shows the contribution of the region to Kazakhstan's overall accommodation infrastructure. This indicator is important because space-launch tourism at Baikonur cannot develop only on the basis of tourist interest in

the cosmodrome. It also requires sufficient regional accommodation capacity, road and transfer services, digital information support, catering facilities and coordinated destination management.

Table 3 presents the main regional indicators that should be used to assess the position of the Baikonur-Kyzylorda tourism area within Kazakhstan's hospitality sector.

Table 3 – Regional tourism indicators of the Baikonur-Kyzylorda tourism area

Indicator	Kazakhstan, 2025	Kyzylorda region, 2025	Share of Kyzylorda region in Kazakhstan, %	Analytical interpretation
Number of accommodation facilities, units	4,482	158	3.5	Shows the regional contribution to the national accommodation infrastructure
Visitors served by accommodation facilities, thousand people	10,087.1	212.3	2.1	Reflects the role of the region in Kazakhstan's tourist accommodation demand
One-time capacity of accommodation facilities, thousand bed-places	232.9	5.0	2.2	Indicates the capacity of the region to receive organised tourist flows
Volume of accommodation services, million tenge	350,637.9	3,288.3	0.9	Shows the economic contribution of the region to the hospitality sector
Source - compiled by the authors based on the Bureau of National Statistics [6].				

The data in Table 3 should be interpreted as a regional basis for assessing the feasibility of Baikonur-related tourism. The regional share remains relatively limited: Kyzylorda region accounts for 3.5 % of accommodation facilities, 2.1 % of visitors served, 2.2 % of one-time accommodation capacity and 0.9 % of the national volume of accommodation services. This indicates that the development of space-launch tourism should begin with gradual and controlled visitor flows rather than mass tourism. In this case, the main priorities are the improvement of the Baikonur–Kyzylorda transport corridor, the expansion and modernisation of accommodation facilities, the introduction of digital visitor information systems and the development of coordinated tour packages. Thus, regional statistics make it possible to connect the symbolic attractiveness of Baikonur with the real capacity of the surrounding hospitality infrastructure.

Digitalisation is becoming one of the main mechanisms for strengthening the competitiveness of hospitality enterprises and destinations. In the hotel sector, digital tools are no longer auxiliary instruments; they increasingly determine how tourists

search for information, choose accommodation, make bookings, evaluate services and share their experience. For Kazakhstan's hospitality sector, the most important digital tools include online booking systems, direct sales channels, virtual tours, personalized services, mobile applications, digital payment systems and data-based destination management.

In hospitality practice, it is important to distinguish between customization and personalisation. Customisations gives guests the opportunity to choose service options according to their preferences, while personalisation adapts the service experience on the basis of collected data and previous guest behavior [8]. This distinction is relevant for Kazakhstan's hotel enterprises because modern visitors increasingly expect flexible, individualized and convenient services.

The national digital system eQonaq is also significant in this context. It creates opportunities for collecting and processing tourist data, improving visitor registration, supporting destination management and increasing the transparency of tourism flows [9]. For Baikonur, such digital

instruments are especially important because attendance at space launches requires advance

planning, regulated access, transport coordination, safety procedures and reliable information support.

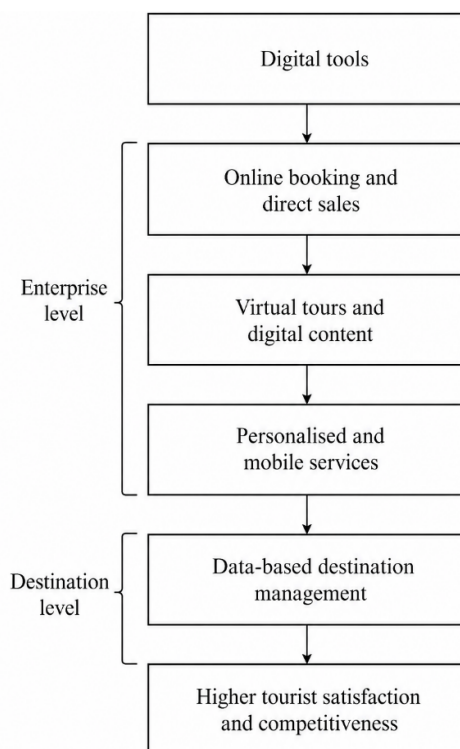


Figure 3 – Digital tools for strengthening hospitality competitiveness (conceptual diagram)
(Source – compiled by the authors on the basis of [8, 9])

Figure 3 shows that digitalisation affects both the enterprise level and the destination level. At the enterprise level, it improves service quality and communication with tourists. At the destination level, it supports visitor flow management, marketing and evidence-based decision-making.

The importance of digitalisation is particularly high for new and specialised tourism products. In the case of Baikonur, digital tools can reduce information barriers, support transparent access procedures, provide tourists with real-time information and integrate accommodation, transport and excursion services into a single visitor journey.

Geographical characteristics of the Baikonur-Kyzylorda tourism area. The Baikonur-Kyzylorda tourism area represents a specific spatial model in which a globally recognised technological site is connected with the service potential of the surrounding region. In this model, the cosmodrome functions as the core attraction, while the regional hospitality system provides the conditions required for receiving visitors. Therefore, the practical development of space-launch tourism depends not

only on the uniqueness of launch events, but also on the ability of the regional environment to support a complete visitor journey.

The spatial organisation of Baikonur-related tourism has a corridor-based character. Visitors attending launch-related events usually require pre-arranged transport, regulated access procedures, accommodation before and after the launch, catering services, guide support and reliable information channels. This makes spontaneous visitation difficult and increases the importance of advance planning. From this perspective, geographical accessibility should be understood not only as physical distance, but also as the quality of transport links, clarity of access rules, availability of accommodation and coordination of services between Baikonur and the wider regional tourism system.

In this study, Baikonur is treated as part of an integrated regional destination rather than as a single isolated attraction. Such an approach makes it possible to assess space-launch tourism through the interaction of technological heritage, hospitality infrastructure, transport logistics, digital

visitor management, safety procedures and cultural interpretation. Consequently, the competitiveness of Baikonur as a tourism destination will depend on how effectively the space heritage of the cosmodrome is combined with regional service capacity and the broader strategic development of Kazakhstan's hospitality sector.

Baikonur is a unique tourism resource for Kazakhstan. Its scientific, historical and symbolic significance creates opportunities for the development of a specialised tourism product based on attendance at space launches, educational excursions, museum routes, scientific interpretation and cultural programmes [10]. Unlike orbital space tourism, which remains expensive and technologically complex, attendance at launches is a more realistic and accessible form of space-related tourism for Kazakhstan in the near future.

The tourism potential of Baikonur is connected not only with the launch event itself, but also with the wider hospitality ecosystem. Tourists need accommodation, catering, transport, guide services, digital information, safety procedures and cultural interpretation. In this regard, the Kazakh tradition of hospitality can become an important soft-power resource, allowing the Baikonur tourism product to combine technological uniqueness with national cultural identity.

However, the practical development of this direction faces several limitations. The accommodation capacity in Baikonur remains limited; the city has several large hotels, including Baikonur, Tsentralnaya and Sputnik, as well as smaller accommodation facilities such as Molniya, Sakura, Kosmonavt and Yuzhnaya. The total room capacity is relatively small, and service standards are uneven. During launch dates, demand increases sharply, which may lead to higher accommodation prices and coordination difficulties for tour operators [11]. Transport accessibility is also a limiting factor, since many visitors travel through Kyzylorda, located about 240 km from the cosmodrome [12].

Documented attendance cases show that individual launch events can attract a significant number of visitors. For example, more than 500 tourists attended the Soyuz MS-22 launch on 30 September 2022. Other documented cases indicate that individual launches may attract more than 2,500 spectators [13]. Based on these figures, it is possible to propose conservative scenarios for estimating potential annual attendance at space launches. These scenarios are not exact forecasts; they illustrate possible orders of magnitude under different assumptions (Table 4).

Table 4 – Illustrative scenarios of annual attendance at space launches at Baikonur

Scenario	Launches open to tourists per year	Average visitors per launch	Illustrative annual visitors	Interpretation
Low	2	2,500	5,000	A cautious scenario based on a limited number of organised launch events
Base	3	2,500	7,500	A realistic short-term scenario under moderate organisational capacity
High	5	2,500	12,500	A more ambitious but still conservative scenario requiring improved infrastructure and coordination
Source - compiled by the authors based on documented attendance cases [14]				

Table 4 keeps the scenario logic conservative and mathematically consistent. The results show that even under cautious assumptions, Baikonur can generate several thousand additional tourist visits per year. This scale is modest in comparison with mass tourism destinations, but it is strategically meaningful for a specialised destination with limited access, high symbolic value and strong media attractiveness.

The development of Baikonur as a tourism destination requires coordinated solutions in several

areas. Infrastructure modernisation should include the improvement of transport links between Kyzylorda and Baikonur, expansion and upgrading of accommodation facilities, development of reliable internet access and creation of visitor-friendly digital information systems. Marketing should focus on positioning Baikonur not only as a launch site, but also as a destination of scientific, historical and cultural significance.

The experience of the COVID-19 crisis demonstrated that the hospitality industry is highly

sensitive to external shocks. A decline in demand, restrictions on mobility, fixed operating costs and additional safety-related expenses can significantly reduce profitability and create liquidity risks [7]. Therefore, the Baikonur tourism model should

include crisis-resilience mechanisms: flexible booking policies, regulated visitor flows, emergency communication systems, sanitary and safety protocols, and coordination between public authorities, tour operators and accommodation providers (Figure 4).

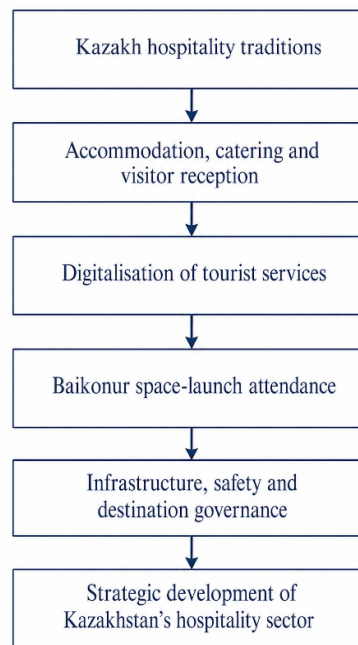


Figure 4 – Integrated model for the development of Baikonur space-launch attendance within Kazakhstan's hospitality sector (conceptual model) (Source - compiled by the authors on the basis of research)

Table 5 – Strategic measures for developing Baikonur as a space-launch tourism destination

Problem area	Current limitation	Strategic measure	Expected effect
Accommodation capacity	Limited number of rooms and uneven service quality	Modernisation of existing hotels and development of mid-range accommodation	Increased capacity and improved visitor satisfaction
Transport accessibility	Dependence on Kyzylorda -Baikonur route and limited local connectivity	Improvement of road transport, shuttle services and coordinated transfers	Easier access to launch events
Digital information	Insufficient integrated tourist information	Online booking, mobile applications, digital visitor registration and real-time information	Reduced uncertainty and improved planning
Safety and regulation	Need for controlled access to launch-related sites	Clear visitor rules, safety standards and intergovernmental coordination	Safer and more predictable visitor management
Cultural interpretation	Weak integration of Kazakh hospitality and local heritage	Educational routes, cultural programmes and local community involvement	Stronger destination identity and higher cultural value
Crisis resilience	Vulnerability to demand shocks and operational restrictions	Flexible booking policies, visitor-flow regulation and emergency protocols	Greater stability of the tourism product
Source – compiled by the authors on the basis of research.			

Figure 4 summarizes the main conceptual result of the study. Attendance at space launches can become a specialised tourism product only if it is integrated with hospitality services, digital management tools, infrastructure development and Kazakh cultural traditions of guest reception. Based on the above, we can cite strategic decisions for the development of Baikonur as a space tourism destination. The key problems and proposed strategic responses are systematized in Table 5.

Table 5 demonstrates that the development of Baikonur tourism should not be reduced to the opening of launch observation sites. It requires a systemic approach combining infrastructure, digitalisation, safety, cultural interpretation and hospitality management. This approach corresponds to the Kazakh model of guest reception, where the quality of the visitor experience depends not only on the event itself, but also on the entire environment of care, respect and service.

Discussion. The findings indicate that Kazakhstan's hospitality sector has a sufficient institutional and infrastructural basis for the gradual development of specialised tourism products. The growth of accommodation facilities, visitor flows and reception capacity in 2011-2025 shows that the sector has recovered from the pandemic-related decline and has entered a new stage of expansion. This result corresponds to the understanding of hospitality as an integrated service system in which accommodation, catering, transport, visitor experience and service quality are interdependent elements [5]. Therefore, the development of Baikonur-related tourism cannot be limited to the launch event itself; it requires a coordinated hospitality ecosystem capable of receiving, informing, transporting and safely managing visitors.

The results also correspond to studies on the vulnerability of hospitality enterprises to crisis situations. The COVID-19 period demonstrated that the sector is sensitive to demand shocks, mobility restrictions, fixed operating costs and additional safety-related expenses [7]. This conclusion is particularly relevant for Baikonur, where tourist flows are event-based and concentrated around specific launch dates. For this reason, the development of space-launch tourism should include not only infrastructure expansion, but also crisis-resilience mechanisms, flexible booking policies, visitor-flow regulation and emergency communication procedures.

The role of digitalisation identified in the study is consistent with research on personalisation and digital service management in hospitality.

Digital tools such as online booking, mobile applications, virtual tours, digital registration and data-based destination management strengthen the competitiveness of hotels and destinations by improving communication with visitors and reducing information uncertainty [8]. In Kazakhstan, the eQonaq system also reflects the increasing importance of digital instruments for visitor registration, tourism-flow monitoring and destination management [9]. For Baikonur, these tools are not merely service innovations; they are necessary for managing access, coordinating transport, providing safety information and supporting tourists before and during launch events.

The results related to Baikonur confirm that the cosmodrome has specific tourism potential based on its scientific, historical and symbolic value. This is consistent with studies that consider Baikonur as an important site for scientific and specialised tourism [10, 11]. At the same time, the present study shows that the practical realisation of this potential is constrained by limited accommodation capacity, uneven service standards, dependence on the Kyzylorda-Baikonur transport corridor and the need for coordinated visitor management. Thus, the central problem is not the absence of tourist interest, but the insufficient readiness of the destination infrastructure and hospitality services.

The scenario estimates clarify the realistic scale of Baikonur space-launch attendance. Documented cases of more than 500 tourists attending the Soyuz MS-22 launch and more than 2,500 spectators at individual launch events demonstrate that demand exists, but it should be interpreted conservatively [13, 14]. Unlike speculative projections of mass space tourism, the proposed range of 5,000-12,500 visitors per year provides a more manageable basis for planning. This is important because Baikonur is a technically sensitive and access-regulated destination where visitor growth must be balanced with safety, environmental standards and intergovernmental coordination.

Compared with broader discussions of space tourism, this study shifts attention from orbital travel to a more realistic form of space-related tourism for Kazakhstan: organised attendance at launches, scientific excursions, museum routes and cultural-technological interpretation. This approach is more appropriate for the current stage of Kazakhstan's tourism development, as it connects Baikonur's space heritage with accommodation services, transport logistics, digital information tools and the cultural tradition of Kazakh hospitality.

The proposed strategic measures are also consistent with the authors' previous registered scientific work on increasing the competitiveness of the hospitality industry in Astana [15]. However, the present article extends this applied perspective to the context of a specialised destination, Baikonur. This makes it possible to consider digitalisation, accommodation capacity, service quality, transport accessibility and cultural interpretation as interconnected factors in the strategic development of Kazakhstan's hospitality sector.

Overall, the discussion shows that the development of space-launch tourism at Baikonur should be gradual, evidence-based and destination-oriented. The priority should not be the rapid increase of tourist numbers, but the creation of a safe, digitally supported and culturally meaningful visitor experience. In this sense, Baikonur can become a distinctive tourism product for Kazakhstan, where technological heritage, digital tools and the national culture of guest reception complement each other.

Limitations and future research. This study is based on secondary statistical, documentary and scientific sources, as well as illustrative scenario estimates. Therefore, the results should be interpreted as an analytical framework for strategic planning rather than as a precise forecast of tourist flows or investment returns. The scenario estimates require further verification through primary data collection, including surveys of visitors, interviews with tour operators, hotel managers and local authorities, and detailed capacity modelling of launch-viewing sites. Future research should also include cost-benefit analysis of infrastructure projects in the Baikonur-Kyzylorda corridor, assessment of environmental impacts and evaluation of digital service adoption among hospitality enterprises.

Conclusion. The study shows that digitalisation and space-launch tourism at Baikonur can be considered interrelated factors in the strategic development of Kazakhstan's hospitality sector. The analysis of statistical dynamics for 2011–2025 confirms that the national accommodation market has generally followed a positive trajectory, despite the temporary decline caused by the COVID-19 crisis. The growth of accommodation facilities, visitor flows and reception capacity indicates that Kazakhstan has a developing institutional and infrastructural basis for creating specialised tourism products connected with unique national resources.

The main result of the study is that Baikonur should be considered not only as a technological and historical site, but also as a potential tourism destination requiring accommodation, catering,

transport services, digital information systems, safety standards and coordinated visitor management. The scenario estimates show that organised attendance at space launches may attract approximately 5,000–12,500 visitors per year under conservative assumptions. These figures should not be interpreted as mass-tourism projections; rather, they provide a realistic planning framework for gradual, safe and manageable destination development.

The scientific novelty of the article lies in the integration of three analytical dimensions: the development dynamics of Kazakhstan's hospitality sector, the role of digital tools in strengthening destination competitiveness, and the potential of Baikonur-based space-launch tourism as a specialised tourism product. This approach allows Baikonur to be analysed through the lens of hospitality infrastructure, digitalisation, visitor experience and strategic destination management rather than only through its technological or historical significance.

The practical significance of the study is reflected in recommendations for policy makers, investors and hospitality operators. From a policy perspective, the development of Baikonur as a specialised tourism destination requires the inclusion of space-launch tourism and digital tourism instruments in national and regional tourism strategies. Priority measures include the modernisation of accommodation and transport infrastructure, improvement of the Baikonur–Kyzylorda corridor, development of clear visitor access regulations, introduction of safety and environmental standards, and creation of a coordinated destination management mechanism.

For investors, the most promising areas include mid-range accommodation, transport services, digital booking platforms, visitor information systems, catering, guided educational routes and space-heritage-related tourism products. For hotel operators, the key priorities are service standardisation, digital communication with guests, flexible booking policies, personalised offers and cooperation with tour operators during launch periods.

The Kazakh tradition of hospitality gives this direction additional cultural value. The development of Baikonur-related tourism should not be limited to the technical observation of rocket launches. It should combine scientific interest, national identity, respectful guest reception and high-quality service. In this regard, Kazakhstan has the opportunity to position Baikonur as a distinctive destination where technological heritage and the cultural code of Kazakh hospitality complement each other.

The study has several limitations. It is based on secondary data and documented attendance cases;

therefore, the proposed scenario estimates should be considered illustrative rather than predictive. The article does not include primary surveys of tourists, hotel managers, tour operators or local authorities, and it does not provide a detailed cost-benefit assessment of infrastructure projects. Further research should include field surveys, expert interviews, capacity modelling of launch-viewing sites, environmental impact assessment and economic evaluation of investment projects in the Baikonur–Kyzylorda corridor.

Thus, the strategic development of Kazakhstan's hospitality sector can be strengthened through the balanced integration of digitalisation, Baikonur

space-launch tourism and national traditions of guest reception. The main objective should be not the pursuit of speculative large-scale tourist flows, but the creation of a safe, well-managed and culturally meaningful tourism product that contributes to service quality, regional development and the international image of Kazakhstan.

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