



## Industrial Organization

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# The effect of technological innovations and digitalisation on the competitiveness of hospitality industry enterprises

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**Subject.** With an increasingly competitive hotel market, it is vital to provide high quality services to increase the number of guests and ensure competitiveness. An essential component of the quality of services at a modern hotel is the digital environment, which is used both for management purposes and to offer the guests digital services.

**Objectives.** The purpose of our study was to analyse the digital systems and technologies used by leading international and Russian hotels and assess their effect on their competitiveness.

**Methods.** In our study we performed a comprehensive case study and analysed statistical data, regulatory documents, articles, and websites concerning the digital transformation of the hospitality industry and the introduction of innovative tools by hotels. We also performed a survey of frequent Russian and international travellers.

**Results.** In our study, we analysed the challenges and development trends of the hospitality industry. We determined the most promising innovations based on digital technologies that are used in the hospitality industry, both in Russia and all over the world. As a result of the survey, we found out that the quality and range of services are important factors when choosing a hotel. With the current turbulence on the market and stricter requirements to comply with, the introduction of digital solutions is of great importance for ensuring the competitiveness of hotel businesses.

**Conclusions.** Digital transformation, the introduction of knowledge-based management systems, and marketing strategies taking into account the absolute digitalisation of society can help hotels to increase their competitiveness, to optimise their number of employees, and to ensure the stable development of the industry as a whole.

**Key words:** digital transformation, hotel business, development strategy.

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## Introduction

The tourism industry is a major driving force for the global economy. Statistics demonstrate that despite the number of tourists having significantly decreased since 2019, in 2021 the contribution of tourism to the global GDP was about 5.8 billion US dollars<sup>1</sup>. The industry is continuously developing and undergoing modernisation following global trends and changes in consumer expectations. The introduction of technological innovations in the hospitality industry is becoming an essential component of development strategies of the leading hotel businesses, as it enhances their competitiveness. The main trend is the digital transformation of the hotel business, which comes in various ways: restructuring business operations to a digital concierge system, mobile keys, and innovative marketing using VR technologies.

Due to the active introduction of innovative technologies, new terminology began to appear. For instance, smart tourism has become an international term. The concept of Smart Tourism is defined by the European Union as a destination facilitating access to tourism and hospitality products, services, spaces, and experiences through ICT-based (Information and communications technology) tools. Researchers point out the global spread of intelligent end-user applications, which help to enrich tourist experience through personalised approach and understanding of the market (Boes et al., 2015). Such smart systems are aimed at supporting the industry through the automation of processes, enhanced effectiveness, development of new products, demand forecasting, crisis management, and creating shared value (Gretzel et al., 2015).

The introduction of digital technologies in the hospitality industry was greatly stimulated by the challenges of the Covid-19

pandemic. It was a time when face-to-face communication ceased and people were afraid to stay anywhere but their homes. The hospitality industry managed to survive under such conditions thanks to a dramatic turn towards the creation and introduction of innovative technologies that had never been used before in the industry. Facing a great challenge, hotels had to introduce new technologies and train their personnel to work with new devices and systems. The use of digital technologies, which helped to minimise personal contact between the guests and the employees, enabled hotels to comply with the strict safety requirements imposed during the pandemic. Since digital systems could cover a lot of the functions performed by hotel and restaurant employees, either partially or completely, the industry has seen some job displacements.

The challenges and limitations faced by the hospitality industry during the Covid-19 pandemic and the way they affected its transformation were studied by leading Russian and foreign scholars (Fang et al., 2020; Michael Hall et al., 2020; Renaud, 2020; Simina et al., 2020; Averin & Andreev, 2021; Ermolenko & Tsygip, 2021; Kabelkaite-Veitkene, 2020). Their studies demonstrated that digital transformation is the most common and the most difficult type of modernisation. Some of the leading hotel businesses (hotel chains) have succeeded in introducing innovative products and technologies. An analysis of the global situation and the experience of large hotel chains determined the main products and technologies which have had the greatest impact on the competitiveness of businesses.

The modernisation of tourist facilities and hotels is a top priority in the Russian Federation. To promote the large-scale development of the industry, the government launched a national project "Tourism and Hospitality Industry" aimed at creating a larger

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<sup>1</sup> Statista. Global tourism industry – statistics & facts. URL: <https://www.statista.com/topics/962/global-tourism/#topicOverview>.

number of destinations within the country<sup>2</sup>. However, besides a larger number of hotels, the modernisation of the industry should also include maintaining the level of service in full compliance with modern requirements. The introduction of digital solutions is one of the key directions of innovative development that can help to achieve this goal. Therefore, a study focusing on the experience of leading hotels which effectively use digital technologies to enhance their competitiveness is undoubtedly of great importance for both companies operating in the hospitality industry and software developers working on VR and AR systems, the Internet of Things, artificial intelligence, and digital doubles.

In our study we performed a thorough analysis of the official websites of companies working in the hospitality industry in order to determine the range of technologies being introduced in the hotel industry and identify the most effective innovations. We also conducted a survey that allowed us to create a consumer image and determine the most important factors affecting their choice and the level of satisfaction. The study demonstrated that the main drivers of innovations in the hospitality industry are the optimisation of business processes and the rational use of resources. Consumers, in turn, highly appreciate opportunities to use digital services both when booking a hotel and during their stay. All these factors together give leading hotels a great competitive advantage. The study demonstrated a wide range of technological innovations used in the hospitality industry. We should note, however, that their successful introduction requires adjustment and testing by every hotel.

Therefore, the digital transformation of the hospitality industry in the Russian Federation requires a lot of time and resources. Advances in this sphere are of the utmost importance for

the national project of the Russian Federation “Digital Economy”.

### Methods

In our study, we analysed the following materials.

- Statistical data provided by the United Nations World Tourism Organization (UNWTO) and the Federal State Statistics Service (Rosstat) was analysed in order to obtain quantitative data and to analyse the dynamics of the studied industry in Russia and globally.

- Programmes and regulatory documents of the Government of the Russian Federation, passport of the national project “Tourism and Hospitality Industry”, and materials of the national project “Digital Economy of the Russian Federation” were studied in order to determine the development tendencies and directions of the industry in the Russian Federation.

- Articles by Russian and foreign scholars focusing on the problem were analysed to develop a theoretical and methodological bases for the study.

- Online publications and websites about the digital transformation of the hospitality industry and the introduction of modern digital solutions by hotels were studied to identify the existing approaches and assess their effectiveness.

The empirical study involved a survey of Russians and foreigners who frequently travel and stay at hotels. The population of respondents (235 people) included the following groups: employed (85.7 %), students (6.3%), retired (7.1 %), and temporarily unemployed (0.9 %). The survey was conducted online using Google Forms<sup>3</sup>. The obtained results confirmed the main hypotheses of the study.

### Results

High competition in the tourism industry, especially in the hotel business, motivates hotel keepers to be creative, welcome innovations, and

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<sup>2</sup> Russia’s National Projects. Tourism and hospitality industry. “National projects”. URL: <https://xn--80aapampemcchfmo7a3c9ehj.xn--p1ai/projects/turizm>

<sup>3</sup> Online survey conducted through Google Forms. URL: Available at: <https://forms.gle/g8BNWZkcHuKgDG3z9>

find new ways to gain an advantage over the large number of competitors (Buhalis & Leung, 2018).

An obvious competitive advantage of any modern hotel is the use of IT equipment and the introduction of digital technologies. Digitalisation is an essential component of the development strategies of most hotel businesses (Alieva & Boris, n.d.). At the same time, the rate of introduction of digital technologies and the choice of solutions directly depend on the technical, financial, and human resources of every company.

In our study, we analysed cases where the successful introduction of innovative digital technologies by certain hotels and by the industry in general which, directly or indirectly, affected their competitive ability. Let's consider the most promising innovations based on digital technologies and used in the hospitality industry in Russia and all over the world.

#### 1. Online booking systems

Convenient and easy to use (although not easy to implement) websites that compare offers by hundreds and thousands of hotels have become a part of our life. The analysis of big data makes it possible to quickly compare accommodation offers based on their location, the level of comfort, price, and availability of certain services.

According to Bnovo<sup>4</sup>, in 2021, 87 % of tourists booked accommodation via Booking<sup>5</sup>. After the company left the Russian market, a number of Russian aggregator sites appeared. As of November 2022, 40 % of travellers in Russia book accommodation using Ostrovok<sup>6</sup>. The second largest service is AllHotelsMarket<sup>7</sup> with a market share of 17.8 %, followed by Yandex.Travel<sup>8</sup>

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<sup>4</sup> Bnovo Management System for hotels. 2022 results. URL: <https://bnovo.ru/blog/bnovo-reviews-the-year-2022>

<sup>5</sup> Booking.com aggregator. URL: <https://www.booking.com/index.ru.html>

<sup>6</sup> Ostrovok online booking service. URL: <https://ostrovok.ru/?sid=c5d3f8a3-0f03-4812-a5b8-83fbbf682c75>

<sup>7</sup> 101Hotels.com. Hotel booking in Russia. URL: <https://101hotels.com>

<sup>8</sup> Yandex.Travel. Online service for trip planning. URL: <https://travel.yandex.ru>

(13.1 %) and Bronevik.com<sup>9</sup> (10.5 %). There are also a large number of other aggregators that share the accommodation booking market. There is also another tendency: consumers now tend to use hotels' own websites more to book accommodation. In 2021, the number of bookings in Russia through aggregator websites was 106,776, with 94,106 bookings via Booking.com, while the number of bookings made using hotels' websites was only 12,670. In March 2022, the number of bookings made directly through hotels' websites grew three times up to 39,203, while the number of bookings made using Russian aggregator websites was 62,235. We can thus see that the total number of online bookings fell, while consumers' trust towards the official websites of hotels grew. Nevertheless, going to the websites of hotels when looking for accommodation takes more time and provides fewer options. We can therefore expect that aggregator websites will grow and develop.

Another factor that has had a significant impact on the accommodation market is the growing interest in the sharing economy. People tend to rent accommodation (a room, an apartment, a house/villa) directly from the owner. When Airbnb<sup>10</sup> first hit the market, it changed the hospitality industry dramatically and imposed great pressure on hotels and guest houses. The growing popularity of short-term homestays, as opposed to staying at a hotel, also has a significant impact on the accommodation market in Russia and motivates hotels to use modern marketing tools to attract and retain customers.

#### 2. Chatbots

A large number of hotels that have websites also use chatbots to keep the attention of potential customers. The key advantage of this tool is the ability to provide clients with quick answers any time of day or night by means of automatic messages in the chat. Chatbots help

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<sup>9</sup> Bronevik.com. Hotel booking in Russia and neighbouring countries. URL: <https://bronevik.com>

<sup>10</sup> Airbnb – Vacation Homes & Condo Rentals. URL: <https://www.airbnb.ru>



to stay in contact with clients using various communication channels and thus covering most requests, including in other languages, which also lowers the language barrier. Chatbots usually reply to frequently asked questions and provide guests with useful information, for instance about the hotel's special offers, which means that the employees have to answer fewer phone calls and e-mails. Such chatbots can be adjusted over time, as companies usually broaden the range of questions and answers based on the current situation. If chatbots cannot provide the required information, they connect clients with a company representative.

Despite all the advantages, chatbots have certain drawbacks. Some customers dislike chatbots because they tend to be too persistent, do not always give the required information, and, most importantly, do not understand feelings and emotions and cannot solve unusual problems. For example, when the COVID-19 pandemic started, there were a lot of cancellations, new restrictions were imposed, and people were afraid of face-to-face communication. As a result, there were certain issues that chatbots could not solve. A chatbot cannot replace an employee, but it can answer simple, frequently asked questions from clients, which reduces the workload of the personnel and creates additional opportunities for customer service. There are a large number of chatbot vendors, so the problem is to find the most suitable and effective, the one that will comply with key criteria. HotelTechAwards<sup>11</sup> conducted a survey of 1192 hotel owners in over 70 countries in order to determine the best chatbot. 98 % of the respondents recommended Asksuite Hotel Chatbot<sup>12</sup>. The service is the world leader in multichannel solutions for hotels and resorts and has been awarded HotelTechAwards several times for the best online chat and the best chatbot.

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<sup>11</sup> Hotel Tech Report. URL: <https://hoteltechreport.com/marketing/hotel-chatbots/asksuite-hotel-chatbot>

<sup>12</sup> Asksuite Hotel Chatbot. World leader in smart service platform for hotels and resorts focused on doubling direct bookings. Hotel Tech Report. URL: <https://asksuite.com>

Taking into account the fact that companies want to minimise the number of employees, while the number of requests from clients is growing, hotels will use chatbots, which can process a large number of requests, as effective digital tools that give a competitive advantage.

### 3. Virtual reality

Virtual reality is one of the most promising innovations in the hotel industry. Luxurious hotels strive to attract clients using hi-tech entertainment. Thus, the Four Seasons Resort Oahu hotel in Hawaii<sup>13</sup> offers a spa combined with virtual reality: for 20-80 minutes, a VR headset takes the guests of the hotel into deep space, ocean bays, or zen gardens. The system produces sounds and even smells, simulates wind, and sets the right temperature. Moreover, the artificial intelligence analyses the data about the breath and heart rate to ensure complete relaxation.

However, virtual reality is most commonly used for marketing purposes. Large hotel chains are beginning to use virtual and augmented reality technologies to demonstrated the potential of the accommodation, its interior and atmosphere. In this way, potential clients can review all the options and chose the most preferable ones without visiting the hotel. This helps to make clients more satisfied, since virtual reality gives them an opportunity to get more accurate information and make informed choices. Leading hotels, such as Radisson<sup>14</sup>, are already incorporating such technologies in the booking process. Most commonly, clients can find a virtual tour of the hotel available on the official website. This feature also increases the number of visitors to the website and the time they spend on the site.

In 2022, we conducted an online survey of people over 18 who frequently stay at

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<sup>13</sup> The resort group. Four Seasons Resort Oahu at Ko Olina and Sensync Partners to Worlds First Multi-Sensory Virtual Reality. URL: <https://www.theresortgroup.com/press/four-seasons-oahu-vessel-immersive-sensory-wellness-experience>

<sup>14</sup> Radisson Hotels. Radisson Blu Hotel, Milan. URL: <https://www.radissonhotels.com/ru-ru/hotels/radisson-blu-milan>

hotels<sup>5</sup>. The main purposes of the trips were the following: tourism (32.7 %), business trip (31.8 %), leisure (24.5 %). According to the results of the survey, 43 % of the respondents said that the official website is an important factor when choosing a hotel. The official website is not just an information platform with a picture gallery and a list of services provided by the hotel. It tells a lot about the status of the hotel and its approach to business. Virtual reality tools presented on the website, which create the participation effect and allow clients to see the hotel in detail, indicate the class of the hotel, its resources, convince clients of the high quality of service and conveys the idea that the hotel follows a policy of transparency. For example, the website of the Shangri-La Hotels and Resorts hotel chain presents a series of videos about their hotels all over the world created using VR technologies<sup>15</sup>. Interestingly, these 360° video tours show the everyday life of the hotel and its guests. Research has shown that such services available on websites help to increase the level of trust on the part of the clients and the likelihood of them choosing the hotel.

We can thus conclude that the use of virtual and augmented reality technologies, which help to demonstrate the range of services available at the hotel, contribute to the competitive ability.

#### 4. Online check-in

The check-in process forms the first impression of the hotel, which determines the mood of the client for their whole stay and their opinion about the hotel in general. A survey of frequent travellers revealed the most important factors affecting the check-in process: waiting time, simplicity of the process, and the level of efficiency and politeness of the personnel. Online check-in systems can be used to check-in before actually arriving at the hotel, which helps to reduce the waiting time and contact with hotel personnel. According to

the available information, Cosmos hotel was the first independent hotel in Russia that introduced such a system in collaboration with Travelline<sup>16</sup> in 2019. Three days before the arrival, the hotel's guests receive an e-mail reminding them to check-in on the official website of the hotel [www.hotelcosmos.ru](http://www.hotelcosmos.ru). The guest fills in an online form and uploads the necessary documents, which are then received by the hotel's check-in system. Upon arrival, the guest shows their passport and gets their key. A similar service is provided by the hotel chain Accor<sup>17</sup>. Here the guest also receives an SMS with useful information (e.g. the number of the parking lot or the name of the bus stop nearest to the hotel).

#### 5. Biometric technologies

Biometric identification systems make the payment process easier. Such technologies are still rare in the hospitality industry. Ushuaïa Ibiza Beach Hotel<sup>18</sup> was the first hotel to use biometric payment via the PayTouch platform. When guests arrive at the hotel, they give their card number and fingerprints of the index and middle finger of the right hand. The system creates an account for each client so that they can monitor all their transactions online and thus be sure they are not being overcharged. Clients don't need to use their credit cards and pin codes any longer. They just need to touch the screen to pay. Fingerprint readers are available at all the hotel's cashier's desks, so there is no need for its guests to carry wallets with them all the time. The uniqueness of fingerprints ensures the safety of any transaction, while reducing the risk of being robbed during vacation. The hotel encourages its guests to participate in the programme by inviting them to events and giving access to VIP areas, discounts, prizes, and special offers.

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<sup>16</sup> Travelline. How does online check-in work. URL: <https://www.travelline.ru/support/knowledge-base/kak-rabotaet-onlayn-checkin-online-check-in>

<sup>17</sup> Accor Live Limitless. URL: <https://all.accor.com/ru/online-check-in-fast-check-out/index.shtml>

<sup>18</sup> Spring wise. Innovation. URL: <https://www.springwise.com/ibiza-hotel-biometric-payments-guests-pay-fingerprints>

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<sup>15</sup> Experience the virtual world of Shangri-La Hotels and Resorts. URL: <http://www.shangri-la.com/vr/en/index.htm>

Biometric technologies are also used in the hospitality industry during the check-in process. A guest scans their IDs and fills in personal data. Then facial recognition is used to verify their identity, after which the guest is granted access to the hotel room. This technology is already used by several Marriott International<sup>19</sup> hotels in China. It helps to optimise some processes and minimise contact between guests and employees. The main advantage of biometric technologies is security, because they can identify people with 100 % accuracy. Additionally, a biometric check-in does not require assistance from the hotel's personnel and takes about a minute, which is very convenient for those guests who do not want to communicate with other people, are tired after their journey, or are in a hurry. The introduction of such technologies has had a positive effect on the quality of service, they help to attract new clients and ensure their loyalty, and thus enhances the competitiveness of hotels.

#### 6. QR code menus

A lot of restaurants have already introduced QR code menus. The idea gained popularity during the pandemic, because it helped to minimise contact and thus prevent the spread of microbes through printed menus. Printed menus are touched by a lot of people and thus present a contamination hazard. A QR code menu is a digital menu that is accessed by scanning a QR code with a smartphone. It helps to avoid the risk of contamination and usually contains more information about the dishes (ingredients, calorific value, etc.) and the restaurant. The QR code menu of the restaurant Alla Grotta<sup>20</sup> in Trento, Italy, presents a detailed description of each dish: its photo, price, ingredients, weight (or the number of people the dish is intended for), as well as information about the restaurant,

its location, and booking options. The digital menu of the Aquaefarina hotel<sup>21</sup> also presents a list of ingredients which might cause allergies (for instance, gluten, grains, nuts, or lactose). If a visitor has any allergies, they should tell the waiter about it.

Hotel restaurants are also introducing QR code menus. It is much more convenient for both visitors and personnel. Digital menus are easy to edit (there is no need to print menu cards anew).

#### 7. Digital room service

Digital room service technologies include mobile keys (guests can open their rooms using their smartphones), tablets, wireless chargers, smart curtains and light, smart TVs, VR sets, etc. All this helps to transform the hotel industry.

Most hotels already use key cards for both guests and employees. Such cards do not just open doors. They are used to collect information about the most frequently visited areas in the hotel (spa, fitness, etc.). This information is then used for service analysis and planning. Some hotels have made a step forward and introduced key wristbands, which, besides opening the rooms, store a lot of information, such as credit card details, ticket information, etc. The fact that smart wristbands combine several functions means that guests do not need to communicate with the hotel's staff.

The wish to minimise contact resulted in the introduction of mobile keys. Instead of carrying a key, some hotels now provide mobile keys available through a special application. Such applications are actually more than keys. They provide guests with information about their rooms and access to online check-ins. To open the room, a guest just needs a mobile device with the application<sup>22</sup>. The mobile device can also be used as a remote controller. The application allows the guest to control smart devices in the room, order food, etc.

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<sup>19</sup> Facial Recognition Check-in in Marriott China. URL: <https://www.youtube.com/watch?v=qNpsdCPGyCk>

<sup>20</sup> Ristorante Pizzeria Alla Grotta. URL: <https://www.pizzeriaallagrotta-trento.it/menu>

<sup>21</sup> Acqua e Farina Trento di Klaus Palumbo. URL: <https://www.acquaefarinatrento.com>

<sup>22</sup> Marriott Bonvoy. The world in the palm of your hand. URL: <https://mobile-app.marriott.com/ru-ru>

Another digital solution is a digital concierge system. For instance, in some hotels, guests can use Siri or Alexa, to access a number of services<sup>23</sup>, including making spa bookings, setting alarm clocks, calling a taxi, controlling the AC, lights, etc. They can also use digital assistants to find out where the nearest restaurants and shops are<sup>24</sup>.

The introduction of digital services increases client satisfaction and allows hotels to obtain detailed information about the clients, which can be used for personalised marketing (Alieva, 2020). Such a comprehensive approach based on the introduction of an informed management system can ensure the long-term competitiveness of hotel business.

### Discussion

The tourism and hospitality industries have been going through turbulence for the last three years. The COVID-19 pandemic and the international developments have significantly affected the range of travelling destinations and the number of tourists. According to the United Nations World Tourism Organization (UNWTO) in 2020 the number of tourists decreased by 73 % as compared to 2019, and the industry lost over 1 billion dollars<sup>25</sup>. In 2021, tourists all over the world made 415 overnight trips, which was 4 % more than in 2020. However, the number of tourists was still 72 % lower than before the pandemic in 2019.

The Russian Federation was also affected by these global trends. Border closures caused by the COVID-19 pandemic in 2020 practically destroyed the inbound tourism market. Hotel owners also suffered significant financial

losses due to restrictions introduced within the country (Ermolenko & Tsygip, 2021). According to the Centre for Economics of Markets, by the end of 2020 the number of hotels and other accommodation facilities in Russia was 27,328, which was 3.4 % fewer than in 2019<sup>26</sup>. In 2021, following the development of domestic tourism and the introduction of supporting measures, the hotel room capacity in Russia grew by 3.2 %: from 730 thousand rooms in 2020 to 753.5 thousand rooms in 2021. In 2021, the number of nights spent in hotels in Russia grew by 65.8 % as compared to 2020.

Despite the positive dynamics, we should note that an increased number of accommodations available always results in greater competition. Consumers in Russia are now much more experienced in travelling than 10 years ago. They want to see a good quality of service, expect a certain level of comfort, and are sensitive to the way they are treated by hotel personnel (Alieva, 2020). Our survey of frequent travellers from Russian and other countries demonstrated that the quality of service is a crucial factor for 67 % of the respondents and is quite important for 27 % of the respondents<sup>3</sup>. Moreover, 87 % of the respondents were interested in a wider range of services provided by hotels. Therefore, hotels should focus on the needs and wishes of their clients and regularly analyse inner factors which can increase their competitiveness. Digital transformation, the introduction of knowledge-based management systems, and marketing strategies taking into account the absolute digitalisation of the society can help modern hotels to survive the competition, improve their performance, optimise the number of employees, and gain profit (Cheng et al., 2023; Veiga et al., 2019; Avilova et al., 2021).

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<sup>23</sup> Apeiron Space. Smart room. URL: <https://apeironspace.com/#page5>

<sup>24</sup> Hotel management. Marriott tests Alexa, Siri for voice-controlled hotel rooms. URL: <https://www.hotelmanagement.net/tech/marriott-tests-alexa-siri-for-voice-controlled-hotel-rooms>

<sup>25</sup> Interfaks. The number of international trips fell by 1 billion in 2020. URL: <https://www.interfax.ru/world/748314>

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<sup>26</sup> Centre for Economics of Markets. Hotel and accommodation market in 2022. URL: <https://research-center.ru/analiz-gostinichnogo-rynka>



An analysis of the studies by Russian and international scholars (Halim et al., 2019; Gomilevskaya & Savluk, 2022; Zalyalieva, 2019; Latkin et al., 2020; Morozov, n.d.; Frolova & Korenko, 2023) and a case study of the world leading hotels allowed us to determine the following directions of digital transformation, which can ensure competitive advantage.

– Artificial intelligence and analysis of big data accumulated and processed by companies aimed at the analysis of the market and strategy development.

– The use of robotic technologies aimed at improving the quality of service and reducing direct contact between clients and employees.

– The introduction of smart home technologies and the Internet of Things aimed at improving the quality of service.

The use of virtual and augmented reality for marketing purposes, to create virtual tours, and to provide entertainment.

A less popular, but still a very promising direction is the use of digital doubles. They are virtual models of real objects, such as hotel rooms, floor plans, and equipment. Digital doubles can be effectively used when designing new projects. When combined with the Internet of Things, it can provide the hotel administration with real-time information, which can be used to control the situation and make timely managerial decisions.

In our study, we wanted to demonstrate the importance of a comprehensive approach including the analysis of the growing market of digital innovations, their introduction at hotels, monitoring of the results, analysing the competitiveness indicators, and surveying consumers and industry representatives. It is also important to analyse ways to improve the hotel management system under digital transformation and in accordance with the modern challenges and opportunities provided by state support programmes in Russia.

## Conclusions

Innovative technologies in the hotel industry boost competitiveness, enhance the loyalty of clients, improve the quality of services, and reduce the workload for hotel employees. International experts agree that “digital revolution resulted in a fundamental turn in the operation of hotels and the way the business is managed. Digital technologies were recognised as the main source of effectiveness and competitive advantages in the hotel industry”.

The use of biometric technologies, artificial intelligence, smart systems, chatbots, virtual reality, and QR codes significantly changed individual hotels and the industry in general. A lot of companies become successful thanks to new technologies and innovative approaches to the tasks facing them. We should note that dramatic changes are not infrequent in the hospitality industry, so hotel owners should be ready to respond quickly to activate and redistribute their resources. However, the dynamics and flexibility of any hotel are only effective when based on constant accumulation of knowledge by the company as a whole and by its employees. Hotel top managers should focus on training and innovations, since they are crucial for survival and greater competitiveness of hotels.

The global crisis induced by the COVID-19 pandemic accelerated the digital transformation of all industries. During the difficult period, hotels were ready to accept the challenge and introduce new technologies that could help them to remain profitable. At the beginning of the pandemic, hotels had a very limited number or no visitors. Some of them did not survive. Those, however, that had enough resources and managed to reorganise the whole operation process to adapt to the changing environment, focused on restructuring the business, personnel training, and introduction of digital solutions. To comply with the sanitary rules and the demand for minimised contact

with other visitors and employees, both large and small hotels started to introduce online check-in systems, which enable guests to check-in before the arrival and obtain access to their rooms without communicating directly with the staff. This was a great competitive advantage in a situation of a contamination hazard, when most people wanted to minimise their contact with others.

In order to modernise their facilities, hotel keepers purchased various gadgets and software for the implementation of new digital services adjusted to the specifics of their operation. The availability of voice assistants, smart home technologies, and other digital solutions affects the choice of most visitors and increases the chances that they will stay with the hotel again. We should also note that today a large percentage of travellers are young people under 35, who can be called digital nomads. For them, a high-speed Internet connection, convenient digital services, and gadgets are an essential part of a good quality service at a hotel. At the same time, they are the type of visitors who are the most active users of social networks. Therefore, a hotel offering digital services of good quality can expect positive reviews and active advertising.

Quality of services is of utmost importance at the growing and highly competitive hotel

market. Taking into account the growing attention to consumer right and the growing number of tourists demanding high quality of service, hotels that use virtual reality technologies to demonstrate their facilities convey the idea of transparency and help customers to make informed choices. Modern technologies make it possible to have a detailed tour of a hotel and see its everyday life. An opportunity to make an informed choice and see the infrastructure of the hotel before arrival minimises the risk that visitors will be dissatisfied and enhances their loyalty.

We can therefore conclude that the digital transformation will remain one of the main driving forces behind the development of the hospitality industry, providing hotels with competitive advantage. The functional components of this transformation should include innovations and services, relationship and experiential marketing, internal and bilateral marketing, and customer orientation. The synthesis of these components will lead hotels to their long-term success on the market.

### Conflict of Interest

The authors declare the absence of obvious and potential conflicts of interest related to the publication of this article.

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## Экономика отраслевых рынков

Научная статья

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### **Влияние внедрения технологических инноваций на конкурентоспособность предприятий индустрии гостеприимства в условиях цифровизации**

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**Предмет.** В условиях растущей конкуренции обеспечение качества услуг индустрии гостеприимства очень важно для увеличения числа потребителей и обеспечения конкурентоспособности. Неотъемлемой составляющей качества услуг современного отеля является наличие развитой цифровой среды, обеспечивающей как функционирование системы управления, так и возможность предоставления цифровых сервисов гостям.

**Цель.** Проведение анализа цифровых систем и технологий, применяемых ведущими зарубежными и отечественными предприятиями индустрии гостеприимства, и оценка их влияния на конкурентоспособность предприятий.

**Методы.** Комплексный анализ кейсов, статистических данных нормативных документов, публикаций и интернет-сайтов, посвященных цифровой трансформации индустрии гостеприимства и внедрению отелями инновационных инструментов. Социологический опрос часто путешествующих российских и иностранных граждан.

**Результаты.** Проанализированы вызовы и тенденции развития индустрии гостеприимства. Определены наиболее перспективные инновации, основанные на цифровых технологиях, применяемые в сфере гостеприимства в мировой и российской практике. В ходе проведенного социологического опроса установлено, что для туристов важными факторами выбора является качество и разнообразие предоставляемых отелями сервисов. В ситуации турбулентности рынка и ужесточения требований к предприятиям индустрии гостеприимства внедрение цифровых инструментов является важным условием конкурентоспособности.

**Выводы.** Цифровая трансформация, внедрение систем управления, основанных на данных (знаниях), применение инновационных маркетинговых стратегий, учитывающих тотальную «диджитализацию» общества, способствуют повышению конкурентоспособности, оптимизации количества занятых и устойчивому развитию отрасли в целом.

**Ключевые слова:** цифровая трансформация, гостиничный бизнес, стратегия развития.

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### **Конфликт интересов**

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