Digital Technologies in the Hospitality Industry in the Context of COVID-19

Elena Shumakova

Far Eastern Federal University, Department of Tourism and Hospitality, Vladivostok, Russia

Keywords: Hospitality, Hotel, Digital Technology, Customer, Experience, Efficiency.

Abstract: Modern society is characterized by the rapid development and spread of digital technologies, as well as radical changes in socio-economic life under the influence of these processes. The last decade has been marked by a steady trend in the development of digitalization in the hospitality industry. The active introduction of modern technologies in the activities of hotels is a prerequisite for their successful operation, since the accuracy, reliability, efficiency and high speed of information processing and transmission determines the effectiveness of management decisions in this area. In this context, the article deals with the features and prospects of using digital technologies in the hospitality industry. In the course of the study, particular attention was paid to the essence of the digitalization of hotel services and the characteristics of the most common technologies that are used by them (blockchain, intelligent robots, Internet of Things (IoT), face recognition technology). In addition, the effects obtained from the digitalization of certain areas of hotel activity and the main reasons for the expansion of the use of new technologies in the future were studied. Particular emphasis was placed on the challenges and difficulties that hinder the use of digital technologies in the hospitality industry.

1   INTRODUCTION

Under modern conditions, the key factor in the development of economy of the XXI century is data presented in digital form. In this regard, advanced digital solutions are given a top priority. Service and information network technologies have taken a special institutional position in the development of modern enterprises and society, becoming the basis of the digital economy (Zhenlong, 2021).

The rapid development of digitalization ensures an increase in competitiveness in almost all sectors of the economy, and, accordingly, has a positive effect on the efficiency of business entities. In addition, the introduction of advanced, breakthrough innovations leads to profound transformations of business processes and, as a result, changes in management systems at all levels. Figure 1 shows the key business processes of enterprises that are primarily subject to digital transformation.
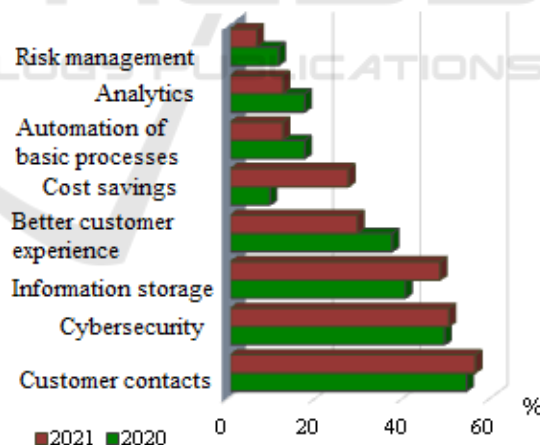

Figure 1: Priorities for business digitalization initiatives in companies around the world from 2020 to 2021 (Eivind, 2020).

The service sector, namely the tourism and hospitality industry, is no exception in this case. The hotel business, like the global economy as a whole, is undergoing a profound technological revolution. Digital technologies in the field of accommodation and reception of guests received an additional impetus for development in connection with the

260

COVID-19 pandemic. As a result of quarantine measures and restrictions on movement, losses to the tourism industry amounted to more than $ 195 billion. According to statistics, there was a 22% decrease in travel in the first quarter of 2020, and arrivals in the middle of the year fell to 57% in all markets. This means the loss of 67 million international tourists and about US $ 80 billion (Hudson, 2020). As a result, the tourism and hospitality industry ranked third in the world for the speed of digital transformation during the coronavirus pandemic (see Figure 2).
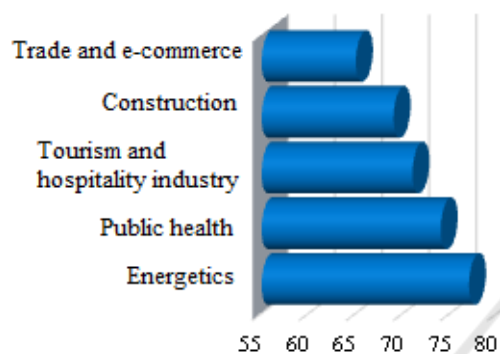

Figure 2: Global impact of COVID-19 on digital transformation speed in 2020 by industry, % (The state of digital, 2021).

Given the transformations and challenges taking place today, digital tools and platforms occupy a much more important place in the operation of hotels than literally a few years ago, because they allow you to ensure safe communication with staff and guests, simplify most of the functions for receiving and placing guests and allow display the main business processes in digital format. On the other hand, hospitality consumers today are looking for better solutions and unique experiences. With one-touch check-in, digital concierge services, voice-activated devices, chatbots, smart in-room technology, advanced analytics, virtual assistant platforms, improved direct booking and more, hotels are rapidly adopting new technologies to exceed customer expectations and digitize their journey as much as possible.

In the context of the above, the fundamental provisions of the organization of management in modern hotels, as well as the implementation of digital technologies in the field of reception and accommodation of guests require deeper scientific and practical research. Such studies, among other things, are necessary to substantiate the strategy and tactics of hotel business development in the context of digitalization both at the national level and at the level of individual tourist destinations.

These aspects determine the research relevance, form its purpose and also determine the methodological basis of cognition.

2 RESEARCH METHODOLOGY

2.1 Page Setup

The importance of studying the impact of digitalization on the development of modern hospitality industry has led to the attention to this problem of foreign and domestic scientists, which include Pasca, Maria Giovina; Renzi, Maria Francesca; Di Pietro, Laura; Guglielmetti Mugion, Roberta; Gubareva O.V., Simonova M.M., Oborin M.S., Miloradov K.A.

Such authors as Mitchenkova N.I., Mustafina A.V., Stepanova V.M., Isupov P.A., Morozova M.A., Singh, Anjana; Munjal, Sandeep; Richard George; Dutta, Kirti; Sharma, Kirti; Goyal, Terjani consider the dual role of digital technologies in the operation of modern hotels, which, on the one hand, are designed for effective interaction between the provider and the consumer of travel services, and on the other hand, allow to increase the efficiency of processing information about guests, their preferences, experience and impressions.

The questions of theory and practice of customer experience management in hotels in the context of digitalization are studied by many scientists, including: Sipe, Lori J., Lelo de Larrea, Gabriela; Altin, Mehmet; Koseoglu, Mehmet Ali; Okumus, Fevzi; Lukashova A.S., Karpov D.S., Gribulina N.V.

Theoretical and methodological foundations and practical tools for the use of digital technologies in the hotel business, the role and place of advanced information solutions and innovations in hotel management and marketing are described in detail in the works written by Voronova O.V., Kharyova V.A., Khnykina T.S., Atadil , Hilmi A .; Erdem, Mehmet; Green, Alison J .; Crinson, Danny.

2.2 Unresolved Parts of the Problem

Paying tribute to the achievements of scientists in this area, we note that a number of problematic issues of the introduction and use of digital technologies in the hospitality industry remain unresolved. In particular, the problems associated with formalization of the key areas of activity of modern hotels, which primarily require digital transformations, need additional study.

Also, the stages of introducing advanced innovations and breakthrough technological solutions

deserve special attention. In addition, adaptive tools for assessing their effectiveness need to be justified.

There are practically no publications that would highlight aspects of developing criteria by which hotel enterprises can navigate the abundance of automated control systems and digital technologies.

2.3 The Purpose of the Article

The purpose of the article is to study the process of formation and use of digital technological opportunities in the hospitality industry.

3 RESULTS OF THE STUDY

First of all, it should be noted that hospitality industry, the hotel business is more than just hotel management. It includes resort and event management, gastronomy, wine and spirits, travel and tourism. According to the World Travel and Tourism Council, today it is an industry with 319 million jobs, which should increase by 100 million over the next 10 years (Morozov, 2020).

In many countries around the world, hotel service is one of the largest in the service sector and is currently undergoing an important digital transformation that is making customer service more personalized than ever. The digital transformation of the hospitality industry as well as digital transformation of hotels work pursues the goal of integrating modern digital technologies into all functional areas and business processes, forms of relations, contact audiences and market segments (Karpov, Gribulina, 2020). This radically changes the process of staying in the hotel and expands the architecture of service delivery, contributes to the transformation of the value attitude of hoteliers to their business, their own employees, partners and guests, the purpose of which is to achieve personal, social and economic goals in a cheaper and faster way, with maintaining a high level of service delivery.

Today it is difficult to imagine the modern functioning of enterprises in the hospitality industry without the use of digital, information technologies. Digital and technological innovations penetrate and are actively used in almost all activities of hotel enterprises, both in the implementation of global management and in the coordination of daily processes. Figure 3 shows the key digital technologies used in hotels today.
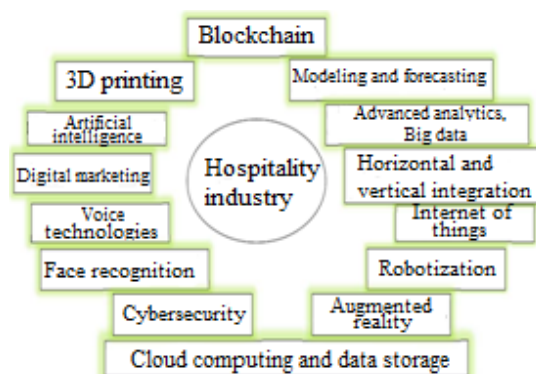

Figure 3: Key technological opportunities of digitalization for the hotel business.

Such technologies as face recognition, artificial intelligence, chatbots and data analytics are modern innovations that are changing the hospitality industry. In the near term, machine learning will be used to incorporate a myriad of external factors into the pricing recommendation process, while personalization in the course of booking will be taken to a new level, for example, by using artificial intelligence to analyze the profiles of people on social networks.

According to experts, the size of the smart (digital) hospitality market is expected to more than double by 2025 compared to 2019 (see Fig. 4).
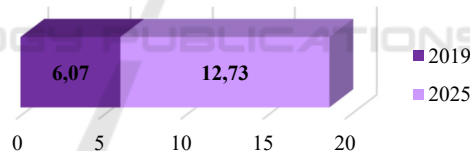

Figure 4: The size of the global smart hospitality market in 2019-2025, billion dollars (Nuenen, 2021).

The widespread use of digital innovations, as well as data processing and transmission technologies allows creating a modern and convenient product for hospitality enterprises, aimed not only at increasing profits, but also at maintaining competitive positions in the market and winning guest loyalty. The effect of the introduction of digital technologies was not long in coming.

Statistics from Toast, one of the world's leading manufacturers of innovative software for the hospitality industry, show that:

- 95% of restaurant owners noted an increase in the efficiency of their business after introducing software technologies into their current operations;

- 73% of visitors believe that the use of modern technology in the hotel gives them more pleasure in their stay and use of services (Adeyinka-Ojo, 2020);
- 26% of consumers believe that the availability of modern technology, the ability to place an electronic order and choose modern payment options affect the choice of a hospitality establishment (Abdullah, 2019).

In addition, as previously noted, many hoteliers have expanded their use of digital tools during the coronavirus pandemic to best comply with the new safety and hygiene practices. Due to the fact that the tourism and hospitality industry was constantly forced to adapt to changing quarantine restrictions, this led to a reduction in the points of contact between hotel employees, service personnel and customers, which helped to quickly adapt processes and standards for cleaning premises (Khamitova, 2019).

A survey of hotel owners around the world about what technologies can be introduced in the coming year showed that the majority of respondents plan to simplify and digitize the processes associated with a guest. 23% of respondents said they will focus on implementing contactless check-in and / or digital key solutions next year, while 19% plan to implement digital guest messaging tools. All this is necessary in order to reduce direct contact with the guest and communicate securely with each other using digital means. Another 10% of respondents also plan to implement tools to automate the daily operation of hotels (Gretzel, 2018).

The main reasons why hoteliers are using digital technology in 2021 are presented in Table 1.

Table 1: The main reasons for using digital technologies in the hotel business in 2021 (% of respondents) (Gannon, 2020).

Improving guest service	Profit growth	Ensuring the future of the hotel	Gaining a competitive advantage	Increase in basic income	Saving financial resources	Time saving
24	18	16	15	11	6	5

A special emphasis should be placed on the fact that rapid changes in the hospitality industry require hotels to intensify their digital transformation in order to preserve their value and bring added value to the business. This can be achieved through partnerships with tech businesses that can identify and clearly identify the relevant issues that need to be addressed first with innovative technology. This strategy is beneficial for all participants: hotels receive added value and optimize business processes, and startups accumulate industry experience they need for further development.

4 DISCUSSION OF RESULTS

Among the advanced digital technologies applied in the hotel industry, which are the most popular today, the following can be distinguished: blockchain, intelligent robots, Internet of Things (IoT) and face recognition technology.

Let's consider the features of their use in more detail.

Blockchain technology. This technology has the potential to revolutionize the way information and data is stored and used, increasing transparency and security while improving transactions. One of the most important aspects of blockchain technology is that data is decentralized, and information is shared on a peer-to-peer network. Each block contains information about transactions and timestamp. Blocks are also permanent and cannot be changed without obtaining permission from all network participants and without changing all subsequent blocks (Novichkov, Savchenko, 2021).

In terms of benefits, blockchain technology can offer the hospitality industry stability and security. For example, hotel employees must transfer customer details to airlines and carriers and insurance agents. Blockchain technology will protect personal data from theft, distortion and illegal use.

There are four key opportunities for applying blockchain technology in the hotel industry.

1. Baggage tracking. Blockchain technology can be very valuable for tracking baggage of tourists, especially when dealing with international travel. The use of a decentralized database greatly simplifies the exchange of information between companies that accompany guests' travel.

2. Identity services. Identity services are extremely important to the hospitality industry, especially during a quarantine period, and blockchain has the potential to become the industry standard for storing this information. The technology used in this way can dramatically reduce check-in or queue times, since a fingerprint or retina can replace documents, which means less time for hotel staff and customers to contact.

3. Safe, traceable payments. It is obvious that payment transactions are one of the most important areas of use of blockchain technology in the hotel industry. The functionality of this technology can make bank payments simpler and more secure, allow

you to pay with virtual assets, for example, bitcoins, as well as increase the level of security of transactions that are carried out with the involvement of mobile payment providers.

4. Customer loyalty schemes. Many hotels are launching customer loyalty schemes to encourage them to return in the future. Blockchain can also help with these programs, simplifying the process, making it easier for customers to get information about their loyalty points, and for hotels to quickly distribute promotions and bonuses. This tool can also help fight fraud in this area.

Intelligent robots. Robotics is rapidly gaining popularity among both hoteliers and their customers, driven in part by changing guest habits, as well as by the COVID-19 pandemic. Increasingly, customers are looking for self-service methods and this makes the automation that robots provide attractive to hotels, travel agents and other businesses.

In addition, hotel teams nowadays often have to face the challenges of providing high quality service when the number of employees is reduced, but the requirements and demands of customers are increasing. As you know, team communication is very difficult during a pandemic. A number of employees are forced to work from home; some are transferred to reduced or limited working hours. All this necessitates restructuring and adapting processes in the hotel. Robotics in this case is the most acceptable solution.

With intelligent robots, hoteliers can overcome most of the challenges by automating and simplifying day-to-day workflows. Digitizing traditional hotel operations is now a priority. The tools and platforms to empower hotel teams to improve their performance are more important than ever.

27% of surveyed respondents in Europe said they plan to automate day-to-day processes to compensate for resource constraints and reduce the burden on small teams. One in six hoteliers says that they plan to implement new workflow management tools in 2022. Another 11% emphasize that they would like to migrate their current systems to the cloud infrastructure in the near future. This would allow hotel employees to access relevant information regardless of location, while communication within the team and the implementation of certain processes would be much easier and faster. (Lam, 2019). The move to the cloud technologies is also an opportunity to start taking advantage of artificial intelligence and machine learning in an ever-growing amount of customer data.

Internet of Things (IoT) technology. This term is commonly used to refer to everyday physical devices, appliances, and other things that are equipped with an Internet connection, making them capable of transmitting and receiving data.

An example of the use of the Internet of Things in hotels is a smart mirror, which, by synchronizing directly with hotel TV and other applications, allows guests to keep abreast of daily news or even watch their favorite TV series simply by clicking on the glass, and all this can happen while cleaning teeth or preparation for going out.

In addition to entertainment for guests, smart mirrors bring significant benefits to the hotels themselves. Acting as the hotel's concierge, the mirror displays information about services, weather, or local attractions that the guest should visit. In addition, being able to navigate and view a virtually holographic platform on a hotel mirror is undoubtedly an experience that a guest will tell friends about, thereby advertising the hotel's services.

With advanced room presence sensors, a hotel can maximize energy efficiency by detecting activity in rooms and automatically adjusting energy levels based on the presence or absence of a guest. In addition, this innovation allows guests to customize their stay using the same presence detection technology. Thanks to Bluetooth, guests can independently adjust the level of lighting, shade, and even locks and minibars in the rooms.

Face recognition technology. Face recognition technology in the hospitality industry can be especially useful as hotels have to deal with a huge number of travelers, so this technological innovation can help speed up workflows (Alrawadieh, 2021).

Let's designate four promising vectors for the use of face recognition technology in the hotel industry.

1. Personalization. For example, hotels can offer guests the opportunity to provide a photo during the booking process in order to avoid the need to check documents upon check-in, and the service staff uses the received data to identify guests who were previously at the hotel.

2. Security. Face recognition allows you to verify the identity of a guest and provide him with access to a hotel room, gym or other specialized facility, without the need to present identification documents. In addition, using this technology, it is possible to identify problem guests or visitors.

3. Data analysis. This technology can potentially be used to identify and verify clients by gender, age and ethnicity. In addition, data mining allows you to determine the mood of guests and find out how they react to different services.

In general, the digital revolution opens up broad prospects for hoteliers and allows them to customize

and transform their business in accordance with the needs of customers, current market trends, and also makes it possible to respond in a timely and most effective manner to global challenges such as the coronavirus pandemic. But, at the same time, digital technologies require industry participants to properly adapt to them, which is associated with a number of problems of both endogenous and exogenous nature.

Thus, the factors hindering the development of digital technologies in the hospitality industry include:

- financial and economic (it is quite difficult for medium and small businesses in the hospitality sector to invest heavily in the digitalization of activities, and government benefits and programs to support and stimulate them are not always provided);
- regulatory (lack of clear regulatory and legal legislation governing the interaction of subjects in the transition to the digital space, including, this concerns the protection of personal data, control of the reliability of accounts and the information provided);
- general instability (differences in the financial and political capabilities of the regions to integrate hotels into the international digital space);
- lack of investment in high-tech industries (the impact of sanctions, limited access to technology transfer and import of ready-made solutions);
- low standard of living of the country's population (lack of the ability to purchase modern, most functional gadgets and to use paid content and Internet roaming services while traveling);
- digital illiteracy of the population (most of the population does not know about the possibilities of digital technologies or is very superficially aware of them).

5 FINDINGS (CONCLUSION)

At a time of tough financial constraints, tougher competition in the market, which is associated with permanently emerging economic crises and shocks, global challenges facing humanity in the new century (coronavirus pandemic, environmental degradation, political instability), the key moment for hotels is to make a decision on how to change their investments and how to spend money to start prospering again.

In this context, the successful functioning of enterprises operating in the hospitality industry is virtually impossible without the use of modern digital technologies. The specificity of the formation and sale of a hotel product requires such high-performance information systems that, in the shortest possible time, would provide information about the availability of rooms, the possibilities of accommodation for tourists, provide for quick reservation and booking of rooms, issue tickets, invoices, and make it possible to receive settlement and reference information.

Digitalization provides many benefits for hoteliers, we are talking about numerous multiplier effects, when all production chains are included in a single information space. World experience clearly shows that the introduction of breakthrough innovations and high-tech solutions in the hotel industry is economically feasible and efficient, since they contribute to generating additional income and reducing costs, improving the service process, ensuring competitive advantages in the market, increasing the efficiency of individual departments and the hotel as a whole.

Thus, it seems that the digitalization of business processes in the field of hospitality services in the modern conditions of digitalization of the global economy is the only strategic direction for the sustainable development of hotels. However, to obtain the effect, it is necessary to gradually enter the field of high technologies according to the following stages:

- recognition of the need for digitalization;
- drawing up a digital business model by integrating individual initiatives and solutions;
- creation of new customer value;
- transition to an integrated digitalization of all processes and services.

Prospects for further scientific research consist in the development of methodological tools for assessing the effectiveness of hotel business management in the context of digitalization of the hotel and restaurant industry.

REFERENCES

Abdullah, S. K., 2019. Disruptive Digital Innovation and Sharing Economy in Hospitality and Tourism Destination. In *IOP conference series. Materials science and engineering*.

Adeyinka-Ojo, S., 2020. Hospitality and tourism education in an emerging digital economy. In *Worldwide hospitality and tourism themes*.

Alrawadieh, Z., 2021. Digital transformation and revenue management: Evidence from the hotel industry. In

Tourism economics: the business and finance of tourism and recreation.

Gannon, M., 2020. Marketing for Tourism, Hospitality and Events: A Global and Digital Approach. In *Tourism analysis*.

Gretzel, U., 2018. Marketing for tourism, hospitality & events: a global & digital approach. In *Anatolia: an international journal of tourism and hospitality research*.

Kristoffersen, E., 2020. The smart circular economy: A digital-enabled circular strategies framework for manufacturing companies. In *Journal of business research*.

Lam, C., Law, R., 2019. Readiness of upscale and luxury-branded hotels for digital transformation. In *International journal of hospitality management*.

Miao, Z., 2021. Digital economy value chain: concept, model structure, and mechanism. In *Applied economics*.

Nuenen T., 2021. Advancements in technology and digital media in tourism. In *Tourist studies*.

Simon H., 2020. *The book,* COVID-19 and travel: impacts, responses and outcomes. Oxford: Goodfellow Publishers.

Shumakova E.V., 2021. Impact of Digitalization on Hotel Industry Development. *Smart Innovation, Systems and Technologies.*

Karpov, D. S., Gribulina, N.V., 2020. Vliyanie cifrovoj ekonomiki na sferu gostepriimstva. *Sovremennye aspekty ekonomiki.*

Morozov, M. A., 2020. Koncepciya cifrovoj ekosistemy industrii turizma i gostepriimstva. *Sovremennye problemy servisa i turizma.*

Novichkov, N. V., Savchenko, E.A., 2021. Blokchejn kak global'naya ekonomicheskaya sistema (na primere turistskogo rynka). *Mezhdunarodnaya ekonomika.*

Hamitova, S. R., 2019. Cifrovye instrumenty kak novyj sposob vzaimodejstviya personala gostinichnoj industrii. *Samoupravlenie.*