

Review Paper

# Digital Transformation in the Hotel and Restaurant Business: The Impact of Technologies on Hospitality Management and Services

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## ABSTRACT

The research on the impact of technology on management and service is devoted to the study and analysis of current technological trends in the hospitality industry. Specifically, it analyzes various aspects of using digital tools, such as web platforms, mobile applications, artificial intelligence, and data analytics, for optimizing processes in this field. This study highlights the key aspects of using digital tools such as web platforms, mobile applications, artificial intelligence, and data analytics to optimize processes in the hospitality industry. The main areas of digital transformation include an increase in the capabilities of mobile applications, the use of virtual and augmented reality, and the introduction of artificial intelligence to personalize services and forecast demand. Customers' accessibility and convenience are becoming essential elements of digital transformation. They allow for online reservations and continuous access to information. Furthermore, this paper highlights the benefits of using digital technologies, particularly when implementing innovative booking, marketing, and service solutions. The authors note that such technologies are becoming an essential element of competitiveness in the face of growing competition and rapid technological development. There are certain challenges related to competition and investment efficiency in the context of the Ukrainian hotel and restaurant business. Nevertheless, the industry is actively adapting to global trends. Based on the results of the research, the authors systematized their findings. They determined that the introduction of digital initiatives can improve the quality of service and provide competitive advantages to the hotel and restaurant business.

## HIGHLIGHTS

- The integration of digital technologies and innovations is essential for the hospitality industry, enabling hotels and restaurants to enhance service quality, improve efficiency, and meet the evolving expectations of modern consumers, ultimately ensuring competitiveness and success.
- While digital transformation brings significant advantages such as personalized services, streamlined processes, and improved customer satisfaction, the hotel and restaurant businesses in Ukraine face challenges, including the need to differentiate themselves, adapt to changing economic conditions, and strategically respond to external factors for sustainable development in a rapidly evolving environment.

**Keywords:** Hotel and restaurant business, digital transformation, innovations, mobile applications, artificial intelligence, data analytics, management, service, competitiveness, customer focus

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The hospitality industry is going through intense change and adaptation to the requirements of the modern world in the context of rapid technological progress. Digital transformation is becoming an integral part of development strategies focused on improving service efficiency, optimizing management, and increasing competitiveness.

The topic is relevant since digital transformation determines both the evolution of business models and affects consumers and their expectations in today's innovative environment. The implementation of digital technologies in the hotel and restaurant industry allows for the improvement of the quality of service, attracts new customers, and ensures their loyalty.

Nowadays, a more straightforward booking process, interactive online services, and other digital tools are revolutionizing how hotels and restaurants interact with their customers. As a result, changes in management, marketing, service, and other aspects of the hotel and restaurant business are becoming necessary steps in achieving success in a competitive environment and rapid technological development.

Consequently, digital transformation is becoming not only a strategic necessity but also an integral part of everyday life for the hospitality industry. The latter is striving both to operate and to improve efficiency and performance quality during this innovative era. By ensuring service efficiency and creating personalized approaches, digital technologies open up new opportunities for attracting and retaining customers. This is a key factor in reaching a new level of competitiveness and achieving a high level of satisfaction from the modern consumer.

This article aims to analyze the impact of digital transformation on the efficiency of management and service in the hotel and restaurant business. The authors focus on technological innovations that affect industry standards. The paper seeks to systematize modern technological innovations used in the hospitality industry, taking into account the following aspects:

- ♦ its impact on strategic management;
- ♦ improvement of service quality;
- ♦ adaptation to the requirements of the modern market.

Furthermore, as part of this topic, it is essential to identify the key aspects of digital transformation that help to improve the efficiency and competitiveness of hotel and restaurant enterprises under the current conditions of technological development.

### Literature Review

In their research, Korzh N.V. and Onyshchuk N.V. (2020) argue that the hotel business has to adapt to new conditions. For this purpose, it is vital to actively use the Internet and social networks, integrate with online services, and introduce convenient online payment methods. Also, it is essential to review the possibilities of opening coworking spaces right in hotels, creating sectors for service apartments, and using the latest technologies for efficient business operations. Moreover, developing new forms of cooperation and willingness to invest in sophisticated technologies such as artificial intelligence, open software interfaces, augmented reality, voice assistants, blockchain, neural interfaces, biometrics, and face recognition systems are also recognized as key components of the development strategy.

In turn, Stegney M.I. and Haustova K.M. (2020) noted that adaptation to new conditions involves:

- ♦ The development of competitive strategies.
- ♦ Consideration of new macro- and microeconomic factors.
- ♦ Strengthening of security measures for tourists.

The authors also identified the need to adapt hotel products and services to the current situation and the new needs of target audiences. They emphasized the establishment of effective communications and the active introduction of new technologies, including information technologies.

Bazhenova S.E., Pologovska I.I. and Kantsur I.H. (2022) noted that the hotel and restaurant business, both during the pandemic and at the present stage, is affected by unexpected and unfavorable conditions. The instability of the economic and political situation in Ukraine, as well as the impact of pandemic restrictions and Russia's military aggression, pose challenges to the dynamics and functioning of the hotel and restaurant industry. The authors believe that, despite its small share in GDP, the hotel and restaurant sector plays a

crucial role in the country's social, reputational, and economic dynamics. In addition to being a significant component of the tourism industry, it is also an essential source of employment for many people.

Milashovska O.I. and Iltyo T.I. (2021) noted that the hotel and restaurant business represents an integral part of the service sector. It is an economic activity of specialized enterprises offering accommodation and catering services. The authors also noted that Ukraine's hotel and restaurant business is at the stage of active development and transformation. It is related to the gradual transition of service establishments to the standards used in leading tourist countries. They also emphasized the need to build a market for hotel and restaurant services in the regions, taking into account market, cultural, and tourist specifics, as well as to improve business processes in this industry.

## METHODS

The following methods were employed in the course of this study:

- ◆ A literature review was utilized to determine the essence and key aspects of digital transformation in the hotel and restaurant business;
- ◆ An analysis of statistical data was conducted to study current innovative approaches and technologies based on the wishes and expectations of modern customers from hospitality establishments;
- ◆ The method of generalization was employed to systematize and summarize various technological innovations in the hotel and restaurant business;
- ◆ The systematization method was used to identify the key problems and challenges of the hotel and restaurant industry in Ukraine, as well as to structure the directions of further development and strategies for implementing innovations;
- ◆ A comparative analysis was used to evaluate modern smart technologies in the hotel and restaurant business and their impact on improving service and socio-economic indicators.

## RESULTS

Today, digital transformation in the hotel and restaurant business is becoming an integral part of development strategies aimed at improving service, optimizing management, and increasing competitiveness in the modern innovative environment. This transformation is not only a necessity but also a key factor in maintaining competitiveness and meeting the modern consumer's needs.

The essence of digital transformation in the hotel and restaurant business lies in transforming and updating all aspects of the industry's activities using modern technologies and digital innovations. This process involves the rapid implementation of digital tools and platforms to improve management efficiency, enhance service quality, and adapt to changes in the modern consumer. The availability and convenience of services in the hotel and restaurant business are key aspects of digital transformation. In this context, the Internet and mobile applications have become powerful tools, as clients can make online reservations for rooms and tables, simplifying the travel planning process.

The integration of digital technologies into business systems improves approaches to organizing and managing hotel and restaurant enterprises, changing the paradigm in all areas of this industry. Therefore, the advantage of digital transformation in the hotel and restaurant sector is the ability to provide personalized service by collecting customer data and adapting services to their needs.

One of the current major trends is the implementation of digital technologies to streamline the stages of hotel and restaurant service. The simplified booking process, available through websites and mobile applications, provides convenience for clients and opens up opportunities for data collection and analysis. The information about guests' choices and preferences allows hotel and restaurant staff to create personalized offers and provide customized service.

In the restaurant industry, digital transformation is also manifested in using technology to automate orders and payment processing, which helps speed up service and reduce the possibility of errors (Sharov, 2021).

In the hotel management sector, digital transformation includes the use of artificial intelligence systems for cost forecasting, inventory management, determining optimal prices, etc. In addition, the implementation of automated systems in the hotel and restaurant business facilitates efficient personnel management and improves the quality of service. In turn, modern consumers, who are adapted to the fast pace of life, highly appreciate the ability to use technology for quick and continuous access to information, services, and entertainment. Digital transformation allows hotels and restaurants to create innovative solutions that meet modern customer requirements and increase customer satisfaction (Yatsyuk, 2023).

Based on the research findings of the NRA Show, it was found that changes in customer wishes and expectations in the restaurant industry reflect the impact of modern technologies on consumer preferences. A detailed analysis showed that 70% of customers appreciate the ability to order food to go, emphasizing the growing demand for takeaway or to-go services. This indicates changes in the lifestyle and preferences of consumers looking for fast and convenient ways to get food. Additionally, 49% of customers expect free Wi-Fi in restaurants. It highlights the importance of staying connected and accessing the Internet for the modern guest, which is an essential factor when choosing a place to go to a restaurant. In addition, 51% of respondents want to make pre-orders by phone, emphasizing the need for more personalized service. This demonstrates the need for restaurants to have efficient systems for taking and processing pre-orders to meet customers' needs (Tymchenko, 2023).

The current generation of consumers is particularly active in using digital resources. 81% of consumers said they look for restaurant menus online. This situation demonstrates the need to establish a restaurant's online presence to attract the target audience. It is worth noting that 29% of restaurants already use payment systems such as Apple Pay and Google Pay, emphasizing the growing popularity of cashless and contactless technologies in the restaurant industry. Based on these trends, restaurants and hotels need to adapt rapidly by implementing innovative solutions to ensure the convenience, personalization, and security of their customers within the digital age context (Buryak *et al.* 2023).

Thus, the introduction of technological innovations is becoming a necessity for hospitality industry players, as it is a key factor in meeting the growing expectations and demands of modern customers. It allows hotels and restaurants to provide a convenient and modern experience, as well as increases their efficiency and competitiveness in the hospitality segment. Contemporary mobile applications empower guests by allowing them to book hotels, restaurants, and other services online, as well as make contactless payments and use a range of other amenities via their smartphones. Virtual and augmented realities (VR and AR) can transform the way guests interact with their surroundings through virtual tours and advanced menus (Kish, 2023).

The implementation of artificial intelligence (AI) in the hospitality industry is becoming increasingly popular. This includes chatbots to handle customer queries and recommendation systems to personalize services and predict demand (Smereka, 2023). AI improves service and optimizes operations. Moreover, automation includes the use of robots and autonomous vehicles to increase the efficiency of guest service. The integration of artificial intelligence into service processes is an essential innovative direction in the hotel and restaurant business. It leads to full automation and a convenient self-service system (Fostolovich *et al.* 2023).

One of the most relevant and exciting novelties is the BellaBot Pudu robot waiter, which has become an effective business solution and is available for purchase and use in Ukraine. Such an innovative development has an affordable price (300 thousand UAH), which is significantly less than the cost of a waiter's salary for a year. The robot also performs the functions of both a waiter and an administrator. Equipped with a display screen for advertising and a range of functionalities, BellaBot Pudu Kitty can greet guests, escort them to their tables, deliver ready-to-eat meals, and communicate with customers by expressing emotions and physical contact (Pudu Technology Inc., 2021).

In addition, the Internet of Things (IoT) is trendy nowadays. It allows the connection of various devices to the Internet, thus facilitating the tracking and control of multiple operations of the establishment. The blockchain, in turn, promotes

security and transparency in the hospitality industry by providing a reliable method of guest identification and transaction management. Particular attention is paid to technologies aimed at sustainable development and environmental protection, including the reduction of energy consumption and waste in hotels and restaurants. As 5G networks continue to develop, Internet connections are becoming even faster and more reliable. This will improve the utilization of mobile applications and provide guests with a better stay experience in hotels and restaurants (Sheyko, 2021).

An essential component of digital transformation includes increasing accessibility and convenience for customers. The Internet and mobile applications make online reservations of hotel rooms and restaurant tables simple and convenient for guests. This not only simplifies the travel planning experience but also provides maximum comfort for guests (Prodius *et al.* 2023). On the other hand, the implementation of digital technologies into business systems opens up new opportunities for organizing and managing the hotel and restaurant business, changing the game rules in this field. At the same time, the speed at which hotel and restaurant businesses adapt to digital transformation determines their competitiveness.

The introduction of modern automated management systems allows to combine all service operations of the hotel and restaurant business into a single operational process aimed at providing comprehensive services, taking into account the needs of each client. This approach contributes to the effective management of all aspects of hotel and restaurant facilities (Fostolovich, 2022).

Present-day realities of the hotel and restaurant business force enterprises to look for innovative solutions to remain competitive and respond to changing consumer demands. The introduction and dissemination of innovations is becoming a necessity at all stages of activity, given the great competition and constant transformations in customer tastes and requirements. One of the key challenges in the hotel industry is excessive competition, where the supply exceeds the demand. These challenges are especially relevant for smaller hotels. It is necessary not only to improve the quality of service but also to provide unique services that go beyond the

standard standards in order to survive and attract more visitors (Yankovska *et al.* 2023).

Additionally, in today's business environment, there is uncertainty about the return on investment. Current trends suggest a return on investment in 5-6 years. However, it is not clear whether a small hotel will be able to cope with this period. The risks are not always fully taken into account, as business owners often face unexpected challenges, such as changing customer preferences or competitors (Smovzhenko *et al.* 2020).

In the context of the gradual development of the hotel industry in Ukraine, the country is actively employing measures that are in line with global trends. However, there is an active development of the market by Western chains and a lack of a clear hierarchy of hotels (e.g., the star system), which often leads to a lack of variability in their quality. Despite the difficulties encountered in terms of competition and investment efficiency, Ukrainian hotels are gradually overcoming these challenges. The focus on European standards and the improvement of service quality determine a positive trend in the development of the hotel and restaurant business in Ukraine. If successfully adapted and innovated, this trend promises positive changes and an increase in the industry's efficiency (Voroniuk, 2019).

With the beginning of the full-scale invasion, which dramatically changed the existing economic circumstances, the need for Ukraine's transition to European economic standards was identified. In this context, the concept of Industry 5.0 becomes extremely relevant. According to current trends in economic development, it is aimed at creating sectoral frameworks to combine the objectives of competitiveness and sustainability. This initiative defines several strategic directions, including an emphasis on alternative management modes, a focus on digital devices to improve employee performance, and the development of sustainable economic models. It is important to note that the expansion of corporate responsibility includes value chains and the introduction of indicators to demonstrate sustainability achievements in various industry ecosystems (European Commission, 2023).

In this context, the hotel and restaurant business determines the vector of increasing the socio-

**Table 1:** Smart technologies in the hotel and restaurant business

Smart technologies	Description
Interactive TV Systems	Hoist Technology Company has developed 3 types of interactive systems with diverse content, such as movies, satellite channels, and music. An important part is advertisement services that inform the staff about the guest’s tastes. They facilitate the choice of film, as well as the ability to order food and drinks via room service.
Energy Management System	The system allows customers to monitor and change the temperature and humidity in the room by using a central computer. It also provides for efficient energy management and reduces the cost of lighting, climate control, and air conditioning.
Back-office management system for hotel services	The system facilitates and enhances the hotel staff’s performance, reducing errors and improving customer service. Each employee’s use of handheld personal computers provides access to data, making it easier to maintain inventory and interact with guests.
Radio Frequency Identification (RFID)	A door lock with Radio Frequency Identification allows customers to enter their rooms and other hotel areas using their mobile phones, saving time that was previously spent on searching for a key.

*Source:* Compiled by the authors based on (Polozhishnikova and Yalovegin, 2021).

economic efficiency of the domestic economy. This is why there is a need for exceptional tools, such as the Diia mobile application developed by the Ministry of Digital Transformation of Ukraine, which introduces an advanced way to provide copies of digital documents. This service not only optimizes processes for hotels but also enhances the convenience and quality of guest service (Koropetska, 2023).

At the same time, smart technologies related to the automation of hotels and restaurants are being updated. They introduce a new level of convenience and efficiency in the service sector (Table 1). To this end, this study considers innovative approaches that improve socio-economic indicators and ensure sustainable development in the hotel and restaurant business (Sereda *et al.* 2023).

Along with electronic management, hotel, and restaurant business, innovations also include the restaurant service sector. A modern restaurant is no longer limited to kitchen operation management but also offers a variety of amenities to its customers, such as:

1. An interactive menu with a screen built into the table, which allows visitors to order dishes and call servers;
2. Tablet screens on the tables allowing guests to read the news and learn more about the restaurant while their order is being prepared;
3. Touchscreen displays in the hotel lobby allow guests to view menus of all food outlets,

choose the best option, and calculate their average check in advance (Berchuk, 2022).

Automation of the restaurant business leads to a noticeable improvement in service quality, staff work simplification, and optimization of product accounting and meal costing. However, these innovations are not limited to information technologies. The practice of an “open kitchen,” where customers can watch the cooking process, is being adapted to modern design. Moreover, it is becoming an essential element of advertising for hotels that go with the times (Kamushkov *et al.* 2022).

It is worth noting that one of the most common vectors in the hotel industry today is the introduction of multimedia technologies, especially concerning electronic directories, booklets, and catalogs. Currently, hotels are actively using electronic platforms to post directories and catalogs on the Internet. This allows for a virtual tour of rooms of various categories, restaurant sections, convention centers, and lobbies, as well as complete information about the hotel structure and the range of services offered, including a system of benefits and discounts.

The application of multimedia technologies ensures promptness in providing potential guests with information about the hotel, facilitating quick and accurate selection of the required hotel product. The invention of the QR code, a two-dimensional barcode that opens up unlimited possibilities for online interaction between companies and consumers, was particularly significant. The QR

code, which can be programmed to transmit various information, opens the way to innovation in the hotel and restaurant business. It is a universal tool for interacting with customers while offering both text and graphic information (Yankovska, 2023).

Consequently, the hotel and restaurant business, being an industry with a high level of information saturation, requires rapid transfer and exchange of information, its relevance, and timeliness. Implementation of modern information technologies, ranging from hotel management programs to global computer networks, is becoming a prerequisite for increasing competitiveness and improving the overall service quality in the hotel sector.

## DISCUSSION

We agree with Korzh N.V. and Onyshchuk N.V. (2020) about the need to adapt the hotel and restaurant business to new conditions. In particular, their research points out that the effective adaptation of the hotel sector involves the active use of the Internet and social networks, integration with online services, the introduction of online payment systems, as well as consideration of the possibility of opening coworking spaces in hotels and creating service apartment sectors. It is also vital to use cutting-edge technologies in doing business, namely:

- ◆ Artificial intelligence.
- ◆ Open software interfaces.
- ◆ Augmented reality.
- ◆ Voice assistants.
- ◆ Blockchain.
- ◆ Neuro-interfaces, biometrics, and facial recognition systems.

At the same time, it is essential to consider opportunities for new forms of cooperation and willingness to invest in modern and sophisticated technologies.

In addition, we also agree with Stegney M.I. and Haustova K.M. (2020) on the importance of effective adaptation of the hotel business. This includes developing competitive strategies, taking into account new macro- and microeconomic factors, and strengthening security measures for tourists. The authors emphasized the need to adapt hotel products and services to the current situation and

the new needs of target audiences. Specifically, they emphasized the importance of establishing effective communications and actively implementing new technologies, including information technologies.

We partially agree with the statements of Bazhenova S.E., Pologovska I.I. and Kantsur I.H. (2022), as their study indicates as follows: the hotel and restaurant business was affected by the unfavorable conditions caused by the pandemic, the instability of the economic and political situation in Ukraine, and the military aggression of Russia. However, we believe that other factors should also be taken into account, as the hotel and restaurant business currently plays an essential social, image, and economic role in the development of the national economy. It is also a key tourism component and a source of job creation. Such an analysis challenges the business sector to develop strategic measures to ensure competitive development in the context of new transformations.

In this respect, we agree to some extent with the opinion of Milashovska O.I. and Iltyo T.I. (2021), as the hotel and restaurant industry is undergoing active development and transformation, adapting to the standards of leading tourist countries. However, in our opinion, it is crucial to take into account the fact that this process may include not only positive changes but also some challenges. In particular, increased competition and rapid technological progress may require the hotel and restaurant business to adapt and take an innovative approach to service provision. It is noted that the industry of production and supply of hotel and restaurant services is subject to macroeconomic factors, such as economic instability and political turbulence. Therefore, we believe that to achieve sustainable development of the industry, in addition to adapting to standards, it is also necessary to take into account and strategically respond to changes in the external environment.

## CONCLUSION

Based on this study, it is worth noting that digital transformation in hotel management is a key factor that allows hospitality companies to ensure competitiveness and meet the growing expectations of modern customers. The implementation of artificial intelligence systems, automated management processes, and other innovative technologies helps not only increase efficiency

and optimize costs but also improve the quality of service and personnel management. Consumers adapted to the fast pace of life are actively using technology to obtain information and provide themselves with a comfortable experience. In turn, innovations make the hotel and restaurant business more accessible and convenient for customers.

Furthermore, innovations play an essential role in overcoming challenges, such as excessive competition and the need to differentiate oneself from other industry players. The introduction of unique services that go beyond the standard standards is a necessary element for attracting and retaining customers. Innovations also influence the development of the industry in the context of global trends, adaptation of European standards, and improvement of service quality.

However, successful digital transformation requires not only the use of information technology but also adaptation to changes in the economic environment. The introduction of the Industry 5.0 concept and the development of sustainable financial models are becoming strategic directions aimed at achieving sustainability and competitiveness.

As a result, the hotel and restaurant business in Ukraine, like all over the world, is going through an essential stage of transformation. A successful integration of technological innovations and response to changing consumer needs determine the further development of the industry.

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