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Project management in the hospitality industry: Theoretical foundations and practical aspects

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Abstract. The aim of the study was to identify ways to implement adaptive project management in the hospitality industry of Ukraine using digital technologies, in particular artificial intelligence based on machine learning. The methodological basis consisted of statistical analysis of the Ukrainian hospitality market indicators for 2020-2024, a comparative study of international practices, and a case study using the example of hotel enterprises in Ukraine and Bulgaria. The results of the study showed that the Ukrainian hospitality market, despite the challenges of the COVID-19 pandemic and full-scale war, is showing signs of recovery: the growth rate of the number of accommodation establishments in 2024 increased by 2%, and tax revenues from tourist fees increased by 23% compared to 2023. It was found that Ukrainian hotels are mainly in the second stage of artificial intelligence implementation (using chatbots for external customer interaction), while Bulgarian companies have reached the third stage (integration of analytics and automation of internal processes). Using the example of the Casa di Fiore SPA & Medical and Izgreva Hotel Complex hotels, the effectiveness of chatbots with machine learning functions was analysed, which made it possible to reduce staff working hours and improve the level of service. A comprehensive assessment of the readiness of Ukrainian hospitality companies to move to higher stages of artificial intelligence implementation was provided, and practical recommendations for the integration of digital technologies into project management were formulated. The practical significance lies in providing a roadmap for the implementation of artificial intelligence tools, taking into account financial, technical and human resource constraints

Keywords: digitalisation; artificial intelligence; chatbots; machine learning; virtual assistant; hotel business; project management; automation; digital competencies

INTRODUCTION

The Ukrainian hospitality market is experiencing economic difficulties due to the invasion of Ukrainian territory by Russian occupation forces. Adaptive project management at each enterprise plays an important role in developing the potential of hospitality establishments. The relevance of this study is due to the need to modernise traditional management approaches at Ukrainian enterprises, which are losing their effectiveness due to digitalisation, changing consumer priorities and demand in the hospitality market.

Adaptability in project management can be achieved with the help of the latest digital technologies. Working conditions have changed radically since the onset of the SARS-CoV-2 coronavirus pandemic due to the increase in remote work and the development of project management software. These trends have increased interest not only among scientists but also among entrepreneurs and managers in the topic of digital technologies and the prospects for their implementation in management (Icard *et al.*, 2023). In analysing the possibilities for implementing digital technologies in project management, M.E. Nenni *et al.* (2024) found that about 35% of all projects have a low success rate due to the low level of use of digital tools to improve their effectiveness. The researchers concluded that artificial intelligence (AI) in this case complements the capabilities of managers through rapid data analysis.

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Given the availability and advantages of using digital tools for project management, S. Bento *et al*. (2022), researching the topic of project management and AI based on a systematic analysis of the literature, concluded that AI is an inevitable implementation for all enterprises in the near future. For example, as a result of analysing the development of project management, H. Tarasyuk (2023) concluded that the optimal approach to management is a combination of new technologies and human labour. The researcher determined that AI can partially fulfil the duties of project managers. Analysing the potential of AI, R.D. Savio & J.M. Ali (2023) determined that in project management, decisions are automated, which expands the possibilities for forecasting and making effective decisions. The researchers saw the prospect of implementing digital technologies, but did not provide recommendations on how this could be achieved in practice.

After conducting empirical research in the form of a survey of employees and their perceptions of the implementation of digital technologies in project management, A.A. Vărzaru (2022) concluded that the result of such implementation is an improvement in all types of activities in project management at the enterprise. I. Taboada *et al*. (2023) came to similar conclusions as a result of a systematic analysis of the literature. The use of AI in project management was studied by F. Shoushtari *et al*. (2024). As a result of the analysis, the researchers found that, compared to traditional management methods, which are accompanied by unpredictable problems and repetitive tasks, AI effectively solves such issues and is therefore appropriate in project management.

However, the opinions of researchers differed, from those who support the implementation of digitalisation in project management to those who argue that such measures are inappropriate. In the course of researching the topic of AI in project support, L. Pereira *et al*. (2024) conducted a survey of managers, which found that most project managers have difficulties with financial and labour resources in their projects. Such difficulties cannot be solved by AI, which calls into question the feasibility of its implementation in project management. Comparing daily operations in a company and project management, M. Bugarčić & M. Slavković (2023) concluded that digital tools are changing traditional processes of planning, controlling and organising projects. The researchers explain this by the fact that the main characteristics of a project – uncertainty and interdependence of operations – must be fulfilled in a specific order, which cannot be achieved by involving, for example, AI.

The conclusions based on the results obtained by previous researchers are general and do not focus on the hospitality industry, given the specifics of how the market works. There are no specific examples of the implementation of AI or other digital technologies in project management in the hospitality industry to increase their adaptability, and there are no details of their implementation or effectiveness for other companies to learn from. This study aimed to determine how Ukrainian hospitality companies can implement adaptive project management using digital technologies. To achieve the study's goal, the following objectives were set: to analyse the potential for development of the hospitality industry in Ukraine after the SARS-CoV-2 coronavirus pandemic and in the context of the Russian-Ukrainian war; to identify successful international experiences in implementing change and the place of Ukrainian and foreign companies in this process; to substantiate and develop recommendations for Ukrainian companies.

MATERIALS AND METHODS

An analysis of the hospitality industry in Ukraine for the period 2020-2024 was carried out. To fully understand the changes in the industry, both statistical analysis of indicators for each calendar year and analysis of indicators in dynamics were used: the number of collective accommodation facilities (individuals and legal entities), the structure of accommodation facilities, tax revenues, occupancy rates of accommodation facilities, and the projected number of tourists after the end of hostilities in Ukraine. To review the current state of the hospitality market, official statistics from the State Statistics Service of Ukraine (2020) were analysed. Data for the period 2021-2024 were taken from the annual reports of Ribas Hotels Group (2024) due to the lack of necessary data on the official website of Ukraine's statistics service, which is primarily due to the non-publication of statistical data during the hostilities in the country. In addition, all of the above data does not take into account information from the occupied territories for each year of data publication and the Autonomous Republic of Crimea. After analysing the development potential of the hospitality industry, possible measures to improve project management for enterprises in the context of digitalisation were identified through a literature review. As a result, not only digital tools that can be implemented in project management were identified, but also the stages of development for the implementation of such tools.

The comparative and descriptive case study method was chosen as the basis for the analysis. The following criteria were established for the selection of practical examples: enterprises had to operate in the hospitality industry; improvements had to be implemented in the enterprise no later than 2020; information on the changes being implemented had to be easily accessible and verifiable, i.e. published on the official website of the enterprise. Two enterprises from Bulgaria and one enterprise from Ukraine operating in the hospitality industry were selected as examples. The objects of the study were hotels: Premier Hotels and Resorts in Ukraine, Casa di Fiore SPA & Medical and Izgreva Hotel Complex in Bulgaria. Within the framework of Ukrainian and Bulgarian hotels, a case study was conducted as an example of the implementation of AI tools in the field of hotel services. For Premier Hotels and Resorts, the effectiveness of the chatbot, introduced in 2019 to ensure automated communication with customers, was evaluated. Particular attention was paid to the functional capabilities of the chatbot, its language adaptation, the scalability of responses, and accessibility through various digital channels (official website, social networks). The effectiveness of the chatbot's implementation was assessed at the Bulgarian hotels Premier Hotels and Resorts and Izgreva Hotel Complex, not only in terms of improving communication with customers, but also in terms of increasing the efficiency of internal hotel management processes related to optimising employee performance and

the management of the entire hotel complex. Particular attention was paid to the functional capabilities of chatbots, technological capabilities and practical advantages. Based on the experience of successful Bulgarian practices, appropriate changes were proposed for Ukrainian enterprises in order to meet market needs and operating conditions.

RESULTS

Despite the impact of the SARS-CoV-2 coronavirus pandemic, Russia's full-scale invasion of Ukraine and occupation of parts of the Kherson, Mykolaiv, Zaporizhzhia, Kharkiv, Donetsk and Luhansk regions, as well as the annexation of the Autonomous Republic of Crimea in 2014, the hospitality industry in Ukraine continues to function. Looking at the structure of the hospitality market, the vast majority of establishments, namely 46%, are hotels and motels (Ribas Hotels Group, 2024). In 2020, the corresponding figure was 64.16%. This means that the number of hotels and motels decreased by more than 0.5 times between 2020 and 2024 (State Statistics Service of Ukraine, 2020). Despite these statistics, tax revenues increased in 2024 compared to 2023 by 23% (UAH 273 million in tourist tax in 2024 compared to UAH 222.618 million in 2023).

The growth of the hospitality industry is due to the partial revival of tourism and the gradual return of foreign visitors. In particular, hotel occupancy in western regions of Ukraine, such as Ivano-Frankivsk, Lviv and Zakarpattia, reached about 50% in 2023-2024. According to analysts' forecasts, after the end of the full-scale invasion, the number of tourists in the Ukrainian market could reach 14 million people. Given these trends, significant investments are needed exclusively for the construction of new recreation and tourism complexes, which are currently insufficient for the projected number of tourists (Ribas Hotels Group, 2024). As of 2024, the number of accommodation establishments in the country decreased by 12.07% and reached 3,487 units (Fig. 1). This absolute indicator is close to the 2017 figure (State Statistics Service of Ukraine, 2020).

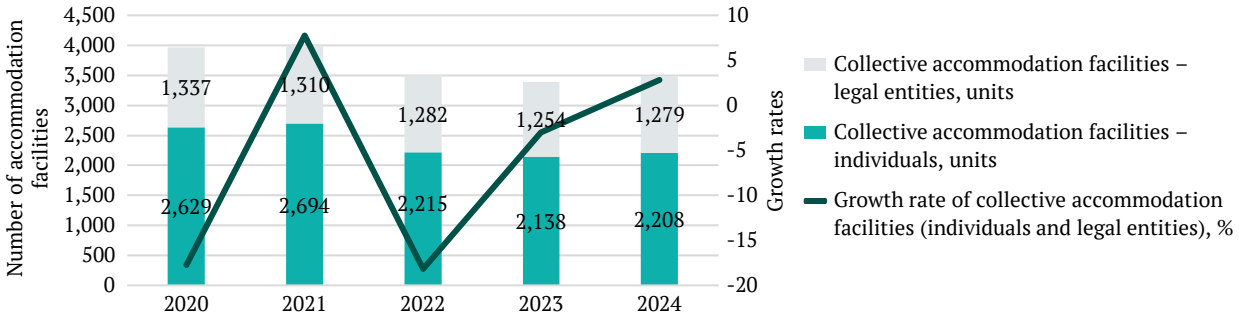

Figure 1. Number of collective accommodation facilities in Ukraine for the period 2020-2024

Source: created by the author based on data from State Statistics Service of Ukraine (2020), Ribas Hotels Group (2024)

Based on the statistical data presented in Figure 1, it can be concluded that both the number of collective accommodation facilities – natural persons and collective accommodation facilities – legal entities decreased by 16.01% and 4.34%, respectively, during the period 2020-2024. The overall growth rate of all accommodation facilities decreased by 18.17% in 2022 compared to the previous year. In other words, a significant decline occurred with the start of Russia's full-scale invasion of Ukraine. Possible reasons include: the occupation of Ukrainian territory and the closure of accommodation facilities; the destruction of Ukrainian hotels and other accommodation facilities by Russia; the bankruptcy of enterprises, etc. However, in 2023, the growth rate slowed to 3%, and in 2024, it exceeded 2%, showing positive dynamics and further prospects for the development of the hospitality industry even in the context of the Russian-Ukrainian war (Ribas Hotels Group, 2024). Therefore, one of the main criteria for success in this process is effective project management in the hospitality industry through the inevitable introduction of new digital tools.

Digitalisation began with the advent of industrial automation (Gsell & Nikodemus, 2025). It was the transition from informatisation to digitalisation that marked the beginning of Industry 4.0 (Bölting *et al.*, 2016). Industry 4.0 is associated with a vision of completely new production structures and value creation based on the widespread use of intelligent information and communication technologies as well as robotics (Hirsch-Kreinsen, 2020; Xu *et al.*, 2021). Digital transformation is characterised by four features: inevitability, high speed, uncertainty in implementation, and irreversibility in production processes (Oswald *et al.*, 2018; Vogel-Heuser & Bengler, 2023). Automation of project management is one of the promising and expedient areas for hospitality industry enterprises. By implementing digital technologies, management personnel can save financial resources and improve the achievement of clearly defined goals. In particular, this applies to the use of AI to perform labour-intensive tasks (Bachynskyi, 2024). The concept of AI was developed over 70 years ago (1956), but it is considered a breakthrough innovation that can change the way various business processes work (Pokorni *et al.*, 2021; Patuelli & Keplinger, 2023). The hospitality industry is no exception. AI is the ability of robots or computerised systems to mimic human intelligence and emotions and behave like humans, based on structuring patterns in large amounts of data, recognising ambiguous and contradictory information, supporting situational decisions based on relative importance, and learning from experience (Bory *et al.*, 2024; Parekh & Mitchell, 2024). AI is used to make informed decisions or recommendations (Volkmar *et al.*, 2021).

As of 2025, there are already successfully implemented projects that have been carefully selected to meet the needs of hospitality industry enterprises based on AI. As a result of comparing the implemented projects, it was found that Ukrainian projects are significantly inferior to international ones in terms of the stages of implementation of AI

in project management. The criterion for comparison was the stages of AI implementation in project management. According to O. Bachynskyi (2024), the improvement of AI in project management involves step-by-step changes. The first stage involved the implementation and automation of certain processes in project management. The optimisation and automation of individual processes is a common practice in enterprises. Examples of such systems include Microsoft Project, Open Plan Professional, Spider Project, Sure Trek Project Manager, Primavera Project Planner and several dozen similar systems that focus in particular on the functions of planning and controlling the execution of tasks.

The second stage involved the introduction of chatbots as project assistants. Text- or speech-based dialogue systems that interact with other users are called chatbots (Weber *et al.*, 2024). Functions such as understanding, reasoning, and learning based on AI enable chatbots to function (Volkmar *et al.*, 2021). Chatbots can perform tasks such as organising communication, checking task completion, and reminding users to complete specific tasks. A significant number of Ukrainian companies in the hospitality industry use chatbots primarily not for internal project management, but for external customer interaction. This feature is the main difference in the focus of AI use in management between Ukrainian and foreign companies in the hospitality industry. An example of such a chatbot is Case 1.

Case 1 – Premier Hotels and Resorts – a chain of 13 Ukrainian hotels located in Kyiv, Lviv, Odesa, Poltava, Pochaiv, Sumy, and Kharkiv. The hotel chain has 1,725 rooms, restaurants, themed event halls, fitness centres, libraries, etc. (Ribas Hotels Group, 2024). In 2019, Premier Hotels and Resorts introduced a chatbot as a channel for communicating with customers. As of 2019, it was the first chatbot implemented in hotels in Ukraine. The chatbot provided round-the-clock communication with customers with 540 possible responses. The chatbot supported a bilingual interface, including Ukrainian and English, on the hotels' official website and official social media pages. In other words, the main goal of implementing the chatbot was to improve customer interaction, rather than project management.

The third stage of implementing AI in project management involved the use of machine learning through available digital tools (Bachynskyi, 2024). In particular, machine learning is one of the most revolutionary technologies in the field of AI (Sharifani & Amini, 2023). That is, this type of learning is the scientific study of algorithms and statistical models with which a computer system performs a specific task. Machine learning is divided into shallow learning and deep learning, which can be based, for example, on supervised or unsupervised learning (Chahal & Gulia, 2019; Pokorni *et al.*, 2021). Deep learning is a growing field of predictive analytics due to its fast and automated processing of information. An example of the practical implementation of such technologies, namely shallow learning, is the hotels in Bulgaria analysed in cases 2 and 3.

Case 2 – Casa di Fiore SPA & Medical Hotel. This is a five-star hotel in Kranevo (Bulgaria), located on the Black Sea coast. The hotel has 184 rooms and 4 apartments, mineral water pools, a beauty salon, a medical facility, a garden, a gym, massage rooms, etc. Due to the large number of different services and requests from hotel guests, as well as internal personnel issues, there was a need to introduce digital technologies in hotel management. The idea behind the introduction of digital technology was not only to improve and automate communication with customers, but also to integrate it with other hotel services (Umni, 2023a).

To achieve this, in 2022, the hotel introduced AI in the form of a chatbot and assistant named "Miss Fiora". The name and avatar of the digital assistant are the result of a carefully thought-out marketing campaign aimed at increasing interest in the use of AI. In addition to developing an avatar in the form of a fairy-tale character, the hotel has introduced a continuous visual presentation on all photos of the hotel website of a real woman whose image is as close as possible to Miss Fiora. This chatbot is located on the main page of the official website of Casa di Fiore SPA & Medical. Due to the fact that the chatbot was developed based on Umni (2023a) AI, it is now possible to support more than 750 topics about the hotel and answer more than 10,000 questions. In the process of communicating with customers, AI learns, improves and expands on the topics that were set as basic when creating the chatbot. The advantage of implementing a chatbot based on Umni was that such digital technologies do not require significant technical knowledge, skills, or competencies on the part of hotel employees to interact effectively with AI. As a result, the chatbot began to perform its main functions, solving the following problems for the hotel: creating and posting information for customers about current discounts and promotions; providing answers to customers in the form of a text or voice module; communicating with guests at night in the form of responses to requests; solving the problem of staff shortages. The chatbot has a main menu where all information about the hotel is presented in a structured manner. Since the hotel complex is also family-oriented, the hotel's chatbot has a special section for children, where all the necessary information for them is provided.

By implementing the chatbot, more than 83,000 hotel guests were helped during the first calendar year of operation. Considering that the chatbot communicated with each guest for a minimum amount of time, for example 1 minute, communication with guests took more than 1,300 hours in total during the year. This corresponds to the work of one employee per month. In this case, the use of a chatbot is an advantage, as communication can take place on weekends and holidays, outside of normal working hours. About 40% of chats with the digital assistant took place at night. Over the course of the year, there were over 500,000 interactions with the chatbot from customers. As a result, the hotel saved 7,000 hours for its employees. At peak times, the chatbot processed about 60,000 interactions per month, as well as about 4,000 interactions per day. Due to high customer demand, the chatbot was integrated with the WebHotelier booking system and a voice recogniser was added, thereby speeding up and simplifying the hotel booking process. As of 2025, the chatbot supports communication with customers via text and voice modules in English and Bulgarian. Thus, the hotel was able to achieve direct integration into the hotel's business processes, improving customer engagement with services and employee engagement with work. At the same time, AI not only provides assistance, but also collects and processes statistical information for management personnel.

Case 3 – Izgreva Hotel Complex. This hotel is located in Banya (Bulgaria), near the Rozlog Valley between the three mountains of Pirin, Rila and Rhodope, not far from the Bansko ski resort. The hotel has rooms and apartments, regular swimming pools and mineral water pools, a restaurant and a summer garden, etc. The problem was that hotel employees were unable to handle a large number of incoming calls, inform customers about booking details, hotel events, etc. Another problem was that the hotel was popular among international tourists, but only a small number of employees were fluent in foreign languages. This reduced the efficiency of the employees' work. The hotel did not actively market itself on social media due to a lack of financial resources and only operated through a poorly functioning website. Since the hotel had an official website, the idea of introducing an AI-based assistant became the main task to be implemented (Umni, 2023b).

At the end of 2021, the hotel implemented an AI-based chatbot called "Izgrevcho". This chatbot is located on the main page of the official website of the Izgreva Hotel Complex. Due to the Umni base, it became possible to support a large number of functions: round-the-clock customer service; communication with international customers; booking rooms, services and venues for events; assisting customers at all stages of the booking process; providing information about the hotel's location; guide to the most important places to visit (ATMs, tourist attractions, etc.). The chatbot has a main menu where all information about the hotel is presented in a structured manner: it is now possible to support over 1,000 topics about the hotel and answer over 10,500 questions.

The implementation of the chatbot into the hotel's operations engaged over 16,000 customers in communication during the first calendar year, resulting in more than 80,000 interactions. On average, the chatbot processed between 200 and 500 requests per day, and on the busiest day of the year, it handled over 4,000 interactions with 3,200 customers. In the busiest months, such as July, there were over 13,000 interactions during the month. Its bilingual interface (Bulgarian and English) enabled the chatbot to interact with customers from 17 countries around the world. Over 40% of customer requests were processed by the chatbot outside of normal working hours. In addition, digitising the restaurant menu enabled the hotel to process and fulfil requests via the chatbot from local villagers and tourists who were not customers of the hotel complex. In total, in 2022, communicating with customers via the chatbot saved over 1,400 hours of management staff time at the hotel. QR codes were introduced to direct all customers to the website with AI and a chatbot.

The placement of the analysed cases in the system of stages of AI development in project management is shown in Table 1. As of 2025, there are no real examples of the use of autonomous AI in hospitality industry enterprises. Given the transition from computerisation to digitalisation of enterprises and the functioning of Industry 4.0, the evolution and development of AI in project management and the transition of enterprises to the fourth stage over time is inevitable (Bölting *et al*., 2016; Bachynskyi, 2024).

Table 1. Placement of cases in the structure of AI development for project management

Development stage	Stage name	Systems	Company example
1	Process automation	Microsoft Project, Open Plan Professional, Spider Project	Typical hospitality industry enterprise
2	Human-computer interaction	Fireflies.ai, Stratejos.ai	Typical hospitality industry enterprise
3	Analytics and advice	Unmi.ai, shallow machine learning	Casa di Fiore SPA & Medical (Bulgaria), Izgreva Hotel Complex (Bulgaria)
4	Autonomous control	Deep machine learning	Future developments

Source: created by the author based on data from A. Chahal & P. Gulia (2019), Umni (2023a; 2023b), O. Bachynskyi (2024)

The use of AI in project management, in addition to automation, improved efficiency, data analytics, and increased productivity, carries significant risks. The relationship between information and trust is the limit of AI. It also concerns the complexity of social relations. Technically mediated communication has its advantages, but also its disadvantages. The limits of AI lie in the complexity of knowledge. This means that the potential of human labour cannot be fully realised through technology. A data- or function-oriented approach to work does not take into account important aspects of human behaviour at work that are necessary for solving complex problems at various levels in the project management process. It also does not take into account the importance of social relationships not only within the team but also outside it (Bachynskyi, 2024). On the other hand, there is also the issue of data security for companies and customers, especially in the cloud. Unpredictable circumstances caused by human intervention or technical errors can cause difficulties for companies in the real estate sector. In other words, a hacker attack jeopardises the security and functionality of companies. It cannot be ruled out that the functionality of digital tools may be compromised in practice (Vornholz, 2021).

Another important recommendation for remedying the situation has a preventive effect, as it concerns not only data protection but also ethics. It is important to adhere to ethical principles when working with AI. AI offers the hope that decisions can be made not only faster and more cost-effectively, but also more objectively and fairly. Ethical requirements of fairness, accountability and transparency must serve as the basis for such interaction (Thalmann *et al*., 2022). If AI is equipped with an explanatory component, ethical problems are significantly reduced. Therefore, on the one hand, it is important to understand the reasons for a particular prediction made by AI. On the other hand, it is necessary to ensure its predictability. Only if these two aspects are taken into account can decisions based on AI be reliable (Sudmann, 2020).

Ukrainian companies in the hospitality industry should rely on Bulgaria's experience of successfully implementing

AI and chatbots with superficial machine learning not only in the process of communicating with customers, but also in the process of managing projects within the company. Namely, the main task for Ukrainian hospitality businesses in 2025 is to identify the main problems in project management that can be eliminated with digital tools and move on to the phase of actively searching for software developers, taking into account and anticipating the threats of AI and achieving maximum benefit from its use in project management. The biggest problems that could create barriers to Ukrainian hospitality businesses moving to the third stage of AI implementation could be a lack of financial resources and insufficient employee competence, as well as the opacity of AI algorithms. However, these problems can be solved in practice.

Another problem is that AI algorithms are not transparent, and systemic inequality is exacerbated by bias in data sets. Companies in the property management sector need to develop concepts that regulate how digital tools collect and process information. The Ukrainian hospitality industry has every opportunity to stimulate the development of such concepts and solve these problems in the near future. The implementation of digital technologies is an expensive process that requires constant investment in technology, processes and systems. For employers, the introduction of digital tools in a company entails additional costs for employee training, software licensing and investment in equipment, restructuring and modernisation. This, in turn, affects the company's productivity. If companies do not have the financial resources to implement complex digital tools, digital technologies can be implemented using mobile devices rather than computers. In addition to the advantages of constant access and ease of use, such implementation requires fewer resources, but can also cause problems. For example, mobile devices have less computing power and less memory than stationary ones (Vornholz, 2021).

In addition, the skills of employees who are new to using AI must also be taken into account. On the one hand, employees need to be trained to use such tools correctly in their work to improve efficiency and safety. On the other hand, technical experts who develop AI-based solutions must understand the specifics of the hospitality industry, its legal restrictions and needs. Therefore, Ukrainian hospitality businesses should first and foremost focus on improving the digital skills of their employees. This refers mainly to digital literacy, i.e. the ability to use computers and software, rather than computer literacy. Digital literacy includes the confident, critical and responsible use of digital technologies and interaction with them for learning, working and participating in society. It is advisable to develop the digital literacy of employees, which includes information literacy, communication and collaboration, security, including cybersecurity skills, problem solving and critical thinking (Vuorikari *et al*., 2022). In other words, it is critically important for employees to be able to use information and communication technologies in such a way that they can easily and quickly search for, evaluation, create and transmit information using digital tools in various forms and formats (Nikou *et al*., 2022). Given the possible rapid transition to the third and fourth stages of AI implementation in the hospitality industry, skills development should not be a one-off approach but requires constant professional intervention on the part of the management of hospitality businesses in Ukraine. If such actions are not implemented, mistrust of new technologies may arise, which will complicate their implementation and use in the hospitality industry in Ukraine.

DISCUSSION

As a result of case studies and literature analysis, it was established that the implementation of AI in project management in the hospitality industry by 2025 is feasible and possible, as confirmed by the successful practice of a Bulgarian company. AI based on superficial machine learning is the basis for chatbots that can be implemented in project management, which has already been implemented in 2022 at the Casa di Fiore SPA & Medical and Izgreva Hotel Complex hotels in Bulgaria. An analysis of practical cases has shown that currently, the only advanced technologies for the Ukrainian hospitality market are chatbots for quick interaction with customers. However, implementation in project management not only at the level of communication between employees and customers, but also the introduction of analytics and statistical processing of information, assistance in managing staff, as revealed by the experience of the Bulgarian enterprise, has not been implemented in Ukraine in 2025. Despite the fact that entrepreneurs in the Ukrainian hospitality industry do not implement similar digital technologies in practice, the results of the study show that the hospitality market has already shown improvement in terms of growth in the number of accommodation facilities and an increase in tax revenues for 2023-2024. This indicates the prospects for the development of this market and the importance of introducing digital technologies into project management. M.I. Shamim (2024) came to similar conclusions, improving the effectiveness of decision-making by introducing AI into project management. After analysing the advantages and risks, the researcher found that it is advisable for companies to follow trends in the technology market in order to maintain their competitiveness among their closest competitors.

Studying current trends in project management in the hotel and restaurant business in Ukraine, V. Postova (2023) identified the main trends that will become reality in the near future. It should be noted that the researcher highlighted data analysis and process automation, which confirms the findings of this study regarding the prospects for the development of AI not only for communication with customers, but also for improving project management performance. However, the researcher identified two more trends that were not analysed in this study: data security when using digital tools and the organisation of remote work for employees. With the increasing number of remote and distance work, project managers must combine the implementation of digital technologies with the ability of employees to work from home. Such conditions significantly complicate the search for alternative solutions. At the same time, it is important to focus efforts on maintaining confidentiality and data protection when working with new digital technologies based on AI. Similar conclusions were reached by researchers A.R. Nabil *et al*. (2025) when studying the possible ethical and legal problems that arise when implementing AI in project management. As a result of interviews and systematic analysis combined with case

studies, the researchers noted that confidentiality is one of the main risks in this process, along with bias in management. Uncontrollable bias in AI can lead to inefficient resource allocation and discrimination in decision-making, which directly affects project outcomes. Due to the large amount of data involved, confidentiality is a weak point in the use of AI in project management. Separate management structures are needed to address these issues. Given the data obtained in this study on the weak implementation of AI in project management in the hospitality industry, it can be predicted that the development and implementation of separate management structures is far from reality for Ukrainian hospitality companies. However, this is only an assumption, which should be analysed in more detail in future studies.

Analysing the stages of evolution of AI implementation in project management, this study has determined that Ukrainian hospitality companies are at the second stage of four in terms of development. However, there is a prospect of increasing the level of AI implementation in project management to the third level, which is characterised by decision-making models for chatbots based on statistical data analysis and staff assistance in project management. This study has identified the potential for the fourth stage of AI evolution in project management: autonomous project management using only AI. However, given the current state of AI implementation in the hospitality industry, this is a distant prospect for Ukraine. This is in contrast to Bulgarian companies, for which such implementation is a near prospect, given the technologies already being implemented in the hospitality industry. As a result of this work, it has been established that there are still no successful examples of autonomous project management in the hospitality industry, due to the complexity of their implementation in practice. Comparing traditional and digital project management tools, J. Gil *et al*. (2020) found that AI-based tools provide more accurate results in terms of process control and monitoring, but an autonomous management system can only be implemented in the distant, but not the near, future, which confirms the results of the analysis conducted in this study. In the coming years, the role of a manager in management will be based on processing information from AI and making decisions. As a result of the analysis, J. Gil *et al*. concluded that the main barriers to the implementation of such models in practice remain the lack of funding. These aspects were not considered in this study. However, these conclusions once again emphasise the importance and feasibility of implementation by enterprises in the hospitality industry based on shallow machine learning rather than deep machine learning, which is more realistic from a financial point of view and has examples of effective implementation in practice.

The analysis revealed that for the effective implementation of digital tools in hospitality businesses, training staff to interact with AI is not a problem, but attention should be paid to training management personnel, i.e. managers who manage projects. The need for professional development was also noted as a result of a comprehensive analysis of the literature by E.K. Zadeh *et al*. (2024), which confirms the conclusions obtained as a result of this study. However, E.K. Zadeh *et al*. noted that despite all the advantages of implementing AI in practice, there are also risks. As a result of this study, these risks include: the aspect of managers' trust in AI and the complexity of social relations in the project implementation process. These results are consistent with those of E.K. Zadeh *et al*., as the researchers drew attention to the problem of managers' dependence on AI and the importance of maintaining a balance between data from digital technologies and managers' experience. The researchers believe that automated solutions are not appropriate in project management and that managers should use AI as a support tool. Therefore, the project management industry is an industry that is constantly changing and evolving along with the business environment in which projects are planned, executed, and completed. Given the opportunities offered by the introduction of third-generation AI chatbots into Ukraine's hospitality industry, it is important for companies to develop this area, starting with training managers and finding software developers.

CONCLUSIONS

The study found that despite a 12.07% decline in the number of accommodation establishments between 2020 and 2024, tax revenues increased by 23% between 2023 and 2024, with the projected number of tourists reaching 14 million. This means that the hospitality industry has opportunities for development, and companies operating in this sector have the opportunity to improve their performance. The analysis determined that a promising direction for the development of this industry is the introduction of digital technologies in project management, namely through AI based on surface machine learning. The study found that Bulgarian hotels have actively implemented such technologies based on Umni AI and achieved better results. Of the four stages of AI evolution in project management, Ukrainian companies are in the second stage of development, while Bulgarian companies are in the third.

Given that as of 2025 there are still no successful examples of the fourth stage of implementing AI based on deep machine learning in project management, and considering the successful experience of Bulgarian enterprises, it is advisable for Ukrainian enterprises to adopt this practice as an example to follow. Adopting this experience is one of the main determinants of enterprise development, on the one hand, and following digitalisation trends, on the other, solving problems that may arise during implementation. Literature on the implementation of AI in project management in the hospitality industry in Ukraine is still in its nascent, which is a limitation of this study as it complicates the analysis of theoretical analysis and practical examples. Therefore, it is advisable to conduct further research with a more detailed analysis of this topic and focus on conducting interviews and qualitative content analysis among Ukrainian entrepreneurs in the hospitality industry, supplementing the results obtained in this study.

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CONFLICT OF INTEREST

None.

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Управління проєктами в індустрії гостинності: теоретичні основи та практичні аспекти

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Анотація. Мета дослідження полягала у визначенні шляхів впровадження адаптивного управління проєктами в індустрії гостинності України з використанням цифрових технологій, зокрема штучного інтелекту на основі машинного навчання. Методологічну основу становили статистичний аналіз показників ринку гостинності України за 2020-2024 роки, порівняльне дослідження міжнародних практик та метод case-study на прикладі готельних підприємств України та Болгарії. Результати дослідження засвідчили, що ринок гостинності України, попри виклики пандемії COVID-19 та повномасштабної війни, демонструє ознаки відновлення: темпи приросту кількості закладів розміщення у 2024 р. зросли на 2 %, а податкові надходження з туристичного збору – на 23 % порівняно з 2023 р. Встановлено, що українські готелі переважно перебувають на другому етапі впровадження штучного інтелекту (використання чат-ботів для зовнішньої взаємодії з клієнтами), тоді як болгарські підприємства досягли третього етапу (інтеграція аналітики та автоматизація внутрішніх процесів). На прикладі готелів Casa di Fiore SPA & Medical та Izgreva Hotel Complex проаналізовано ефективність чат-ботів із функціями машинного навчання, що дозволило скоротити робочий час персоналу та підвищити рівень обслуговування. Надано комплексну оцінку готовності українських підприємств індустрії гостинності до переходу на вищі етапи впровадження штучного інтелекту та сформовано практичні рекомендації щодо інтеграції цифрових технологій у проєктний менеджмент. Практичне значення полягає у наданні дорожньої карти впровадження інструментів штучного інтелекту, з урахуванням фінансових, технічних та кадрових обмежень

Ключові слова: цифровізація; штучний інтелект; чат-боти; машинне навчання; віртуальний помічник; готельний бізнес; проєктний менеджмент; автоматизація; цифрові компетенції