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THE ROLE OF ARTIFICIAL INTELLIGENCE IN ENHANCING E-BUSINESS IN THE HOSPITALITY INDUSTRY

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Abstract

This paper analyses the role of artificial intelligence in enhancing e-business in the hospitality industry, with emphasis on marketing, reservation systems, and revenue management. The study examines key applications of AI, including the personalisation of customer experience, conversational systems, dynamic pricing, and predictive analytics. The findings indicate that the implementation of artificial intelligence results in more efficient online communication, higher booking conversion rates, improved performance indicators such as RevPAR and ADR, and greater customer satisfaction. At the same time, the paper identifies important limitations to its implementation, primarily concerning investment costs, data protection, and the development of the necessary organisational and human resource capacities. It is concluded that artificial intelligence is a significant driver of digital transformation and competitiveness in contemporary hotel business.

Key Words: artificial intelligence, e-business, tourism, hotel industry, personalization, digital transformation

JEL classification: O33

Introduction

The hospitality industry is undergoing rapid digital transformation, with artificial intelligence now playing a significant role in this change. Since 2022, AI has evolved from a standalone innovation to a strategic tool for hotels aiming to stay competitive in a rapidly changing global market. The growth of digital platforms, the expansion of customer data, and the need

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for quick and accurate decision-making have driven hotels towards intelligent systems capable of processing information in real time (Talukder & Das, 2024; Bathla et al., 2025). In this context, AI enables hotels to better understand guest preferences, respond more quickly to market changes, and manage key business processes more efficiently (Talukder, 2024).

AI's role in hospitality is evident throughout the entire e-business chain. It is used in marketing personalisation, reservation automation, demand forecasting, dynamic pricing, and the optimisation of back-office operations (Buhalis et al., 2019; Jain, 2025). Generative AI, machine learning, and conversational tools are transforming how hotels communicate with guests, shape their offerings, and manage revenue (Saleh, 2025; Baburao et al., 2025). Simultaneously, automation reduces operating costs, while personalised digital solutions enhance guest experience, loyalty, and revenue growth (Tariq, 2025; Ibirinoye-Abdulkareem et al., 2025).

Three areas are particularly prominent: marketing, reservation systems, and revenue management. AI enhances market segmentation and content personalisation, supports 24/7 customer communication through chatbots, and optimises pricing through predictive analytics. As a result, its most significant effects are seen in marketing personalisation, booking accessibility, and financial performance (Kaur et al., 2024; Gatera, 2024; Ibirinoye-Abdulkareem et al., 2025; Baburao et al., 2025).

This paper explores the role of artificial intelligence in e-business within hospitality, focusing on business performance, guest interaction, and operational efficiency. It also considers the main benefits and limitations of AI implementation, including high costs, data privacy concerns, and the need for new employee skills (Mariani et al., 2018; Ibirinoye-Abdulkareem et al., 2025; Baburao et al., 2025).

Literature Review

Theoretical perspectives on AI in hospitality e-business

Understanding the role of artificial intelligence in hospitality e-business requires a theoretical perspective that explains both technology adoption and its business impact. The literature most often refers to three frameworks: the Technology Acceptance Model (TAM), the Diffusion of

Innovations theory (DoI), and the Resource-Based View (RBV). Together, these approaches show that AI should be seen not only as a technological tool, but also as a source of organisational change and competitive advantage.

TAM explains technology use through perceived usefulness and ease of use (Gatera, 2024). In hospitality, this is especially relevant for understanding the adoption of chatbots, virtual assistants, and personalised communication systems. Research shows that users trust AI more when it provides fast, accurate, and personalised responses, which can increase their willingness to use and pay for services (Cunha et al., 2024). TAM is also useful for examining how employees accept AI tools in digitally supported work environments (Kaur et al., 2024).

DoI broadens the analysis to organisational and industry levels, showing that adoption depends on factors such as relative advantage, compatibility, and complexity. In hospitality, it helps explain why some hotels adopt AI more quickly than others (Huang et al., 2021; Gatera, 2024).

RBV, in contrast, treats AI as a strategic resource that enhances data processing, forecasting, and decision-making, thereby supporting long-term competitiveness (Gatera, 2024; Baburao et al., 2025; Al-Romeedy, 2026).

Key areas of AI application in hospitality e-business

Recent literature shows that AI has the greatest impact on hospitality e-business through personalisation, revenue management, customer support, and operational automation. One of the most visible applications of AI is the personalisation of the guest experience. Recommendation systems and adaptive interfaces analyse search history, previous bookings, and user behaviour to provide more relevant options in real time (Ibirinoye-Abdulkareem et al., 2025; Gayathri, 2025). Research indicates that this can reduce decision fatigue and increase booking conversion rates (Ibirinoye-Abdulkareem et al., 2025). Generative AI also enables the creation of personalised content, while integration with CRM systems enhances guest segmentation and makes upselling and cross-selling more effective (Talukder, 2024; Cunha et al., 2024; Saleh, 2025; Al-Romeedy, 2026). This aligns with findings that AI-based marketing strategies can positively influence business performance in tourism organisations (Jevtić et al., 2025).

Another major area is revenue management. By analysing seasonality, booking pace, competitor prices, local events, and demand elasticity, AI enables hotels to forecast demand more accurately and adjust prices in real time. Studies show that this improves indicators such as RevPAR and ADR and supports better sales coordination across channels (Gatera, 2024; Baburao et al., 2025). Review-based evidence also shows that hotel performance research is increasingly centred on pricing, forecasting, and revenue management, with big data and machine learning becoming more prominent analytical tools (Arnejo & Sarsale, 2025).

A further issue identified in recent literature is the role of e-business as a catalyst for transformation across various organisational contexts in hospitality. For small and medium-sized enterprises (SMEs), AI-supported digital tools can enhance market visibility, customer targeting, service personalisation, and overall competitiveness (Bešić et al., 2024; Jevtić et al., 2025). In larger hotel systems, AI and e-business solutions are increasingly linked to stronger data integration, more consistent service delivery, and more efficient pricing and customer relationship management practices (Al-Romeedy, 2026; Cunha et al., 2024). This indicates that the impact of AI-enabled e-business goes beyond operational improvement and contributes to broader transformation in both smaller hospitality businesses and international hotel groups (Bešić et al., 2024; Al-Romeedy, 2026).

Customer support and operational efficiency also represent important areas of application. AI chatbots and virtual assistants allow hotels to provide 24/7 assistance with reservations, check-in, check-out, and additional services (Kaur et al., 2024; Cunha et al., 2024). At the same time, AI contributes to operational efficiency through RPA, predictive maintenance, and more intelligent energy and resource management (Bhupender et al., 2024; Tariq, 2025; Bathla et al., 2025; Jain, 2025).

At the same time, the literature points to important research gaps, particularly regarding regional differences in AI adoption, employee adaptation, ethical concerns, and the lack of long-term financial evidence (Gatera, 2024; Bathla et al., 2025).

Methodology

This paper is based on a structured literature review of recent sources examining the role of artificial intelligence in e-business within the hospitality industry. The analysis primarily covers publications from 2022

to 2026 that address AI applications in hotel marketing, reservation systems, revenue management, customer support, and operational efficiency. A total of 21 scientific sources were included in the review.

The selection of sources was guided by inclusion and exclusion criteria. Included were scholarly publications relevant to hospitality, tourism, digital transformation, and business applications of AI, while sources unrelated to the hotel business, purely technical studies without managerial implications, and insufficiently substantiated materials were excluded. The reviewed articles were sourced via Google Scholar, Crossref, and the journal and publisher platforms where the selected papers were indexed or published.

For analytical purposes, the selected literature was grouped into thematic categories: personalisation, conversational AI, revenue management, operational automation, and implementation challenges. This approach enabled the identification of key application areas, major benefits, and main limitations of AI in hospitality e-business.

As the paper is based exclusively on secondary sources, no primary data were collected. Ethical considerations were addressed through careful source selection, balanced interpretation of findings, and the inclusion of both positive and critical perspectives to reduce interpretative bias.

Findings and Discussion

The reviewed literature indicates that the value of artificial intelligence in hospitality lies not only in isolated applications, but also in its ability to connect key functions of hotel e-business into a more integrated system. AI-supported marketing generates demand through personalised communication and more precise guest targeting; reservation systems convert this demand into bookings through automated, always-available support; and revenue management ensures these bookings are realised under more favourable pricing conditions. Therefore, the strongest contribution of AI is not limited to individual tools, but lies in the synergy between personalisation, automation, and data-driven decision-making across the guest journey (Talukder, 2024; Baburao et al., 2025; Jevtić et al., 2025; Al-Romeedy, 2026).

Benefits and Implementation Challenges of AI in Hospitality

Artificial intelligence provides substantial benefits to the hospitality sector, notably by enhancing service quality, operational efficiency, and market responsiveness. A major advantage is its ability to personalise services and guest communication through data analysis, allowing hotels to better understand customer needs, tailor offers, and increase bookings, loyalty, and ancillary spending (Talukder, 2024; Ibirinoye-Abdulkareem et al., 2025). Simultaneously, automating customer support, reservation processes, and administrative tasks reduces operating costs and enhances service speed and availability (Kaur et al., 2024; Bhupender et al., 2024; Jain, 2025).

AI also enhances decision-making. Predictive analytics and real-time data processing give managers clearer insights into demand trends, sales channels, and customer behaviour, supporting better pricing, capacity planning, and marketing (Gatera, 2024; Baburao et al., 2025). In revenue management, these benefits are particularly evident in improved RevPAR, ADR, and overall profitability (Gatera, 2024). AI can also promote sustainability by increasing the efficiency of resource and energy use (Tariq, 2025; Bathla et al., 2025).

However, AI implementation presents significant challenges. High initial costs, the need for reliable data infrastructure, and difficulties integrating new tools with existing systems remain major barriers (Gatera, 2024; Al-Romeedy, 2026). Ethical and regulatory concerns, especially regarding privacy, security, and data protection, are also highly relevant (Cunha et al., 2024; Dewangan et al., 2024; Al-Romeedy, 2026). Additionally, employee resistance, the need for new skills, and organisational readiness for change indicate that AI in hospitality should be viewed not only as a technical innovation, but also as a broader process of organisational adaptation (Gatera, 2024; Tariq, 2025). This view is supported by research emphasizing that digital technologies and employee knowledge jointly shape the competitiveness of personalized tourism and hospitality offers (Bešić et al., 2024).

Development Prospects and Future Trends

The future of artificial intelligence in hospitality points towards deeper integration into hotel e-business. One of the clearest trends is hyper-personalisation, with systems adapting content, offers, and communication

to individual guests in real time. In this context, generative AI is expected to play an increasing role in creating personalised recommendations, marketing content, and automated communication (Cunha et al., 2024; Saleh, 2025).

Another important trend is the further development of conversational AI. Chatbots and virtual assistants are likely to move beyond basic customer support and become more advanced tools based on CRM data, booking history, and guest preferences. In revenue management, predictive and self-learning models will support more accurate demand forecasting and dynamic pricing (Gatera, 2024; Baburao et al., 2025). At the same time, the integration of AI with IoT technologies will help hotels improve sustainability through more efficient use of energy and other resources (Tariq, 2025; Bathla et al., 2025).

However, future progress will depend not only on technology but also on how hotels address ethical, regulatory, and organisational challenges. Issues such as transparency, data protection, and preserving the human aspect of service will remain essential (Dewangan et al., 2024; Bathla et al., 2025; Al-Romeedy, 2026). Thus, the future of AI in hospitality lies in balancing efficiency, business value, and service quality.

Conclusion

This paper has demonstrated that artificial intelligence is now a central driver of e-business transformation in the hospitality industry. Its use is most evident in personalised marketing, reservation systems, revenue management, and operational automation, where it leads to better service quality, greater efficiency, and enhanced business performance. The most significant measurable effects are particularly apparent in revenue management, with improvements in indicators such as RevPAR and ADR, while chatbots and automated reservation systems increase service availability and reduce operational workload.

At the same time, the findings indicate that the benefits of AI arise not from isolated tools, but from their integration into a broader digital business model. In this context, AI strengthens the connection between marketing, reservations, and pricing decisions, enabling hotels to respond more effectively to guest expectations and market changes. However, its full potential still depends on overcoming major implementation barriers,

including high investment costs, data privacy concerns, and the need for stronger organisational and employee capabilities.

It can therefore be concluded that artificial intelligence is no longer an optional technological addition in hospitality, but a strategic requirement for competitive and sustainable hotel operations. Future progress in this area will depend not only on technological development, but also on hotels' ability to balance efficiency, innovation, and the human dimension of service.

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Author's note on the use of AI

AI tools were used solely as an aid in the linguistic and stylistic refinement of the text and were not used to generate original research findings, data, or conclusions.

References

1. Al-Romeedy, B. S. (2026). AI-driven knowledge and intelligence: a strategic framework for competitive advantage in tourism and hospitality industry. *Business Process Management Journal*, ahead-of-print(ahead-of-print), 1-32. <https://doi.org/10.1108/bpmj-06-2025-1024>
2. Arnejo, A., & Sarsale, M. (2025). Measuring hotel financial performance: A bibliometric review. *Hotel and Tourism Management*, 13(2), 117-135. <https://doi.org/10.5937/menhottur2500017A>
3. Baburao, C., Gangadhara, R. R. S., Talukder, M. B., Sheela, P., & Ouariach, F. Z. (2025). AI-Powered Smart Revenue Management in Hospitality. In *Smart Operations and Enhancing Guest Experience in the Hospitality Industry* (pp. 219-240). IGI Global. <https://doi.org/10.4018/979-8-3373-2145-5.ch008>

4. Bathla, G., Raina, A., Rana, V. S., & Bhushan, B. (2025). The Impact of Artificial Intelligence and Automation in Transforming the Hospitality Sector. In *Transforming the Service Sector With New Technology* (pp. 541-552). IGI Global. <https://doi.org/10.4018/979-8-3693-7447-4.ch033>

5. Bešić, C., Bogetić, S., Bakator, M., & Petrevska, I. (2024). The impact of sustainability, digital technologies, and employee knowledge on the competitiveness of personalized tourist offer. *Hotel and Tourism Management*, 12(1), 133-152. <https://doi.org/10.5937/menhottur2400010B>

6. Bhupender, Sapna, & Hitesh. (2024). Harnessing technology and artificial intelligence for enhancing guest experiences in the hospitality and tourism industry. In *Futuristic Trends in Management Volume 3 Book 10* (pp. 72-84). Iterative International Publisher, Selfpage Developers Pvt Ltd. <https://doi.org/10.58532/v3bhma10p1ch4>

7. Buhalis, D., Harwood, T., Bogicevic, V., Viglia, G., Beldona, S., & Hofacker, C. (2019). Technological Disruptions in services: Lessons from Tourism and Hospitality. *Journal of Service Management*, 30(4), 484-506. <https://doi.org/10.1108/JOSM-12-2018-0398>

8. Cunha, M. N., Pereira, M., Cardoso, A., Figueiredo, J., & Oliveira, I. (2024). Revolutionizing luxury: The role of AI and machine learning in enhancing marketing strategies within the tourism and hospitality luxury sectors. *GeoJournal of Tourism and Geosites*, 55(3), 1345-1353. <https://doi.org/10.30892/gtg.55335-1307>

9. Dewangan, S., Kumar, S., & Tyagi, P. K. (2024). Transforming Hospitality and Tourism With AI and Innovative Technologies. In *Impact of AI and Tech-Driven Solutions in Hospitality and Tourism* (pp. 66–83). IGI Global. <https://doi.org/10.4018/979-8-3693-6755-1.ch004>

10. Gatera, A. (2024). Role of Artificial Intelligence in Revenue Management and Pricing Strategies in Hotels. *Journal of Modern Hospitality*, 3(2), 14-25. <https://doi.org/10.47941/jmh.1957>

11. Gayathri, N. (2025). Enhancing Efficiency of Hospitality and Tourism Sector with Artificial Intelligence. *ComFin Research*, 13(S1-i1-Mar), 74–77. <https://doi.org/10.34293/commerce.v13is1-i1-mar.8657>

12. Huang, A., Chao, Y., de la Mora Velasco, E., Bilgihan, A., & Wei, W. (2021). When artificial intelligence meets the hospitality and tourism industry: an assessment framework to inform theory and management. *Journal of Hospitality and Tourism Insights*, 5(5), 1080–1100. <https://doi.org/10.1108/jhti-01-2021-0021>
13. Ibirinoye-Abdulkareem, B. S., Adedotun, K. J., Adekunle, J. O., & Raji, A. K. (2025). Enhancing Guest Satisfaction in Hotel Booking Websites through AI-Driven Personalization and Adaptive User Interfaces. *Nigerian Journal of Technical Education*, 24(2), 83-93. <https://doi.org/10.63996/njte.v24i2.32>
14. Jain, S. (2025). AI in B2B Marketing and Its Applications in the Hospitality Industry. In *Addressing Contemporary Challenges in the B2B Hospitality Sector* (pp. 69–98). IGI Global. <https://doi.org/10.4018/979-8-3693-9760-2.ch003>
15. Jevtić, J., Marić, D., & Leković, K. (2025). The mediating effect of artificial intelligence marketing strategy on the relationship between value co-creation and business performance of travel agencies. *Hotel and Tourism Management*, 13(1), 59-79. <https://doi.org/10.5937/menhottur2500001J>
16. Kaur, M., Pandey, U., & Kaur, A. (2024). Leveraging AI for 24/7 Support. In *Impact of AI and Tech-Driven Solutions in Hospitality and Tourism* (pp. 302–328). IGI Global. <https://doi.org/10.4018/979-8-3693-6755-1.ch016>
17. Mariani, M., Baggio, R., Fuchs, M., & Höepken, W. (2018). Business intelligence and big data in hospitality and tourism: a systematic literature review. *International Journal of Contemporary Hospitality Management*, 30(12), 3514–3554. <https://doi.org/10.1108/ijchm-07-2017-0461>
18. Saleh, M. I. (2025). Generative artificial intelligence in hospitality and tourism: future capabilities, AI prompts and real-world applications. *Journal of Hospitality Marketing & Management*, 34(4), 467-498. <https://doi.org/10.1080/19368623.2025.2458603>
19. Talukder, M. B. (2024). Implementing Artificial Intelligence and Virtual Experiences in Hospitality. In *Advances in hospitality, tourism*

and the services industry (AHTSI) book series (pp. 145-160). IGI Global. <https://doi.org/10.4018/979-8-3693-2019-8.ch009>

20. Talukder, M. B., and Das, I. R. (2024). The Technology Impacts and AI Solutions in Hospitality. *i-manager's Journal on Artificial Intelligence & Machine Learning*, 2(1), 56-72. <https://doi.org/10.26634/jaim.2.1.20291>

21. Tariq, M. U. (2025). The Role of AI in Transforming Hospitality Operations-Enhancing Efficiency and Guest Experience. In *Smart Operations and Enhancing Guest Experience in the Hospitality Industry* (pp. 415-446). IGI Global. <https://doi.org/10.4018/979-8-3373-2145-5.ch016>