The Multifaceted Impact Of Artificial Intelligence (Ai) In The Hospitality Sector: A Critical Assessment

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Abstract
Artificial Intelligence (AI) is transforming hospitality by reshaping operational processes, guest experience, labour dynamics, and strategic decision-making. This study offers a critical, multi-dimensional assessment of AI's influence, examining its economic, social, ethical, environmental, and regulatory implications. While AI enhances efficiency through automation, predictive analytics, and personalised service, it also raises concerns about data governance, algorithmic bias, workplace surveillance, and the erosion of human warmth in service interactions. Environmental benefits achieved through optimised resource management are offset by the significant energy and material demands of AI infrastructures. Regulatory frameworks remain fragmented and often inadequate for addressing the sector's distinctive reliance on personal data and intelligent automation. The study argues that AI's value depends on technological capability as well as on responsible governance, human-centred design, and sustainability commitments. It concludes that balanced, ethically informed adoption is essential for ensuring that AI supports a more equitable, resilient, and environmentally conscious future for hospitality.

Keywords: Artificial Intelligence (AI); Hospitality Industry; Digital Transformation; Sustainable Tourism; Ethical AI; Human–AI Interaction; Personalisation; Guest Experience; Environmental Sustainability; Data Governance; Responsible Innovation

Introduction
Artificial Intelligence (AI) has moved from a peripheral innovation to a structural force reshaping contemporary hospitality. An industry long defined by interpersonal interaction, experiential nuance, and emotional labour is now increasingly mediated by systems that learn, predict, and decide at scale. Predictive analytics, contactless service technologies, virtual concierges, and AI-driven sustainability tools are reconfiguring how hotels design guest journeys, structure work, and cultivate competitive advantage (Buhalis & Moldavska, 2022; Ezzaouia & Bulchand-Gidumal, 2023). This transformation is not merely operational; it touches the cultural, ethical, and environmental foundations of hospitality, prompting a re-examination of what it means to serve, to host, and to create value in digitally augmented environments.

Strategic pressures have accelerated AI adoption as much as technological capability. Heightened global competition, shifting guest expectations, labour shortages, and rising sustainability obligations have positioned AI as a strategic instrument for organisational agility and resilience (Garcia & Adams, 2022; Limna, 2023). Intelligent systems allow firms to harness expansive data flows, operationalise personalisation, optimise revenue management, and automate back-of-house routines with unprecedented precision. Yet such capabilities also expose longstanding vulnerabilities, such as opaque decision-making, concentration of data power, algorithmic inequities, intensified employee monitoring, and the environmental burdens of data-heavy infrastructures (Binesh & Syah, 2025; Du & Xie, 2021; Crawford, 2021). These tensions highlight a central paradox of AI in hospitality as the very tools marketed as solutions may simultaneously deepen ethical, ecological, and social risks if deployed uncritically. Against this backdrop, this study offers a holistic and problem-focused assessment of AI's multifaceted role in hospitality. Rather than treating AI as a neutral or inevitable upgrade, it interrogates how intelligent systems reshape economic performance, cultural norms, labour conditions, environmental sustainability, and regulatory governance. It argues that AI's long-term contribution depends on an ability to reconcile technological

efficiency with human sensitivity, ethical accountability, and ecological responsibility. This requires resisting simplistic narratives of progress and instead examining how AI redistributes agency, modifies experience design, restructures work, and reframes organisational commitments to sustainability (Jose et al., 2020; Reis, 2024).

The study proceeds by outlining the technological foundations of AI in hospitality before turning to its economic, social, ethical, environmental, and regulatory implications. It concludes by synthesising these dimensions, emphasising that responsible adoption must align innovation with normative commitments to transparency, fairness, and sustainability.
This integrated perspective contributes to broader debates on digital transformation in hospitality by demonstrating that AI's significance extends far beyond automation or financial efficiency. Understanding its impact requires recognising AI as a socio-technical system whose effects, positive or problematic, emerge through interactions between technology, people, and institutions. The aim is to illuminate pathways through which hospitality organisations can leverage intelligent technologies while safeguarding the human and environmental values that define the industry's longstanding purpose.

Methodology

This study employs a qualitative integrative review methodology to examine the multifaceted impacts of artificial intelligence (AI) in the hospitality sector. This approach is particularly appropriate for an area characterised by rapid technological evolution, fragmented empirical evidence, and uneven theoretical development, as it enables the systematic integration of diverse bodies of knowledge while supporting critical reflection on dominant assumptions and narratives (Snyder, 2019; Torraco, 2016). AI in hospitality operates as both a technological system and a socio-organisational force; accordingly, the review draws on literature from hospitality management, information systems, organisational studies, and AI ethics to capture its economic, social, environmental, and regulatory dimensions. This interdisciplinary orientation reflects an understanding that AI adoption is shaped by technical capability as well as by organisational cultures, institutional arrangements, and broader socio-technical contexts (Mariani, 2020; Crawford, 2021).

The literature was sourced from major academic databases, including Scopus, Web of Science, ScienceDirect, Emerald Insight, and Google Scholar, using keywords related to AI, digital transformation, sustainability, algorithmic management, and hospitality operations. The review prioritised publications from 2015 to 2025, a period marked by the accelerated diffusion of AI applications in hospitality, while incorporating earlier seminal works where they offered essential conceptual grounding. Sources were selected based on their relevance to at least one of the manuscript's core thematic areas and their contribution to understanding AI's broader organisational and societal implications.

Analysis followed the principles of thematic synthesis (Thomas & Harden, 2008), with inductive coding used to identify recurring patterns and tensions across operational, labour, ethical, environmental, and governance-related discussions. These patterns were subsequently developed into higher-level analytical themes that illuminate how AI is reshaping hospitality in complex and often contested ways. To strengthen conceptual rigour, the review applied established quality guidelines for integrative research and relied on cross-disciplinary triangulation to avoid narrow or technologically deterministic interpretations (Whittemore & Knafl, 2005; Orlikowski & Iacono, 2001). Reflexive analysis further supported critical engagement with assumptions surrounding efficiency, innovation, and progress, particularly where industry-led narratives risk obscuring social, ethical, or environmental consequences (Stankov et al., 2022; Shestakofsky, 2017).

Technological and economic dimensions of AI in hospitality

Artificial Intelligence (AI) has become a structural force in the evolution of hospitality, transforming how organisations operate, compete, and define value. Its influence extends across operational efficiency, strategic management, workforce practices, guest experience, and revenue optimisation. Far from a neutral upgrade, AI constitutes a shift toward data-driven governance involving automation, predictive analytics, and algorithmic decision-making; changes that simultaneously introduce organisational, ethical, and economic tensions (Buhalis & Moldavska, 2022; Ezzaouia & Bulchand-Gidumal, 2023; Ivanov & Webster, 2021).

At an operational level, AI-driven systems underpin a wide range of functions including front-desk automation, housekeeping coordination, inventory management, and preventive maintenance (Aphisavadh, 2025; Limna, 2023). Automated check-in kiosks, virtual concierge services, and predictive housekeeping tools streamline routine tasks and enhance accuracy (O'Connor & Murphy, 2004). The post-pandemic expansion of contactless technologies further embedded automation as both an efficiency measure and a safety expectation (Solnet et al., 2019). Yet concerns persist regarding depersonalisation, guest acceptance, and the erosion of the human-centric ethos historically associated with hospitality (Tussyadiah, 2020; Ladeira et al., 2023).

AI also reshapes strategic management and organisational decision-making. Machine-learning based revenue systems synthesise booking data, competitor prices, sentiment analysis, and environmental signals to generate fine-grained demand forecasts and dynamic pricing decisions (Enholm et al., 2022; Talón-Ballestero et al., 2022). Advanced models can evaluate thousands of variables to optimise RevPAR, contributing to more adaptive and analytically sophisticated pricing practices (Henriques & Pereira, 2024). Predictive maintenance, supported by IoT sensors, reduces downtime and prevents costly equipment failures (Zhang et al., 2019; Shaik, 2023). However, greater reliance on opaque "black box" algorithms risks managerial deskilling and overconfidence in automated judgement (Davenport & Ronanki, 2018). Guest-facing technologies, including chatbots, natural language interfaces, personalised recommendation engines, and AI-enhanced CRM platforms, have become central to experience design (Bulchand-Gidumal, 2022; Tussyadiah, 2020). These systems support targeted marketing, personalised itineraries, and tailored promotions that enhance both service relevance and commercial yield (Kozak & Correia, 2025). Nevertheless, their reliance on behavioural profiling intensifies data extraction practices, raising concerns about surveillance and the normalisation of constant behavioural monitoring (Zuboff, 2019). Security applications, such as facial recognition and anomaly detection, promise operational safety (Dwivedi et al., 2025), yet also deepen dilemmas around informed consent and the ethical limits of surveillance (Martin & Nissenbaum, 2020; Wang et al., 2024).

AI plays a strategic role in workforce management through recruitment screening, performance prediction, scheduling, and training platforms (Doborjeh et al., 2022; Ersoy & Ehtiyar, 2023; Shi et al, 2025). While these tools increase consistency and decision quality, they also risk embedding algorithmic bias and expanding workplace surveillance (Brougham & Haar, 2018; Dwivedi et al., 2025). The economic narrative often emphasises labour displacement, yet empirical studies increasingly show labour reallocation: AI absorbs routine tasks while freeing employees to engage in roles requiring judgement, empathy, and creative problem-solving (Buhalis etal., 2019; Limna, 2023; Khoa et al., 2023; Chen et al., 2023). Such augmentation can enhance job satisfaction and organisational adaptability when accompanied by adequate training and participatory implementation.

Economically, AI contributes to cost efficiency, revenue growth, and competitive agility.

Automation in inventory tracking can reduce supply costs by up to 30%, while predictive maintenance prolongs asset life and minimises interruptions (Shaik, 2023). Data-driven forecasting has produced cost reductions of around 15% in tourism and travel agencies (Ali et al., 2025). Revenue optimisation tools further strengthen profitability: dynamic pricing algorithms improve forecasting accuracy (Henriques & Pereira, 2024) and personalised upselling tools can raise room-level revenue by 40–50% (Khoa et al., 2023; Chen et al., 2023). High-performing firms increasingly attribute a substantial share of their growth to AI-enabled marketing and CRM systems (Kozak & Correia, 2025).

Yet these benefits are accompanied by structural risks. Early adopters gain "exponential learning" advantages that compound over time (Garcia & Adams, 2022), raising concerns about widening competitive disparities, particularly for smaller firms with limited data capabilities or capital resources (Ali et al., 2025). Significant upfront investment, integration complexity, and the need for digital skills still constrain adoption (Aphisavadh, 2025). Moreover, over-reliance on automated decision-making may lead to pricing anomalies, algorithmic opacity, or erosion of service authenticity; challenges that intersect with broader ethical debates about fairness, transparency, and accountability (Dwivedi et al., 2025; Khoa et al., 2023).

Sustainability-oriented AI applications, including smart energy management, water optimisation, and automated waste monitoring, offer environmental benefits (Liu et al., 2022; Zhang et al., 2019; Onyeaka et al., 2023). However, these gains must be balanced against the environmental costs of AI infrastructures, particularly energy-intensive data centres and growing electronic waste (Berthelot et al., 2024; Crawford, 2021). As a result, technological progress in hospitality carries a planetary footprint that requires holistic assessment rather than uncritical celebration.

Taken together, the technological and economic dimensions of AI in hospitality reveal an emerging "intelligent hospitality ecosystem" (Buhalis & Moldavska, 2022), characterised by tighter integration of automation, analytics, and personalisation. Yet this ecosystem is also shaped by power asymmetries, organisational choices, and societal norms. Realising the benefits of AI while mitigating its risks demands investment in digital infrastructure as well as in human capability, ethical governance, and strategic restraint. Only through such balance can AI enhance economic performance without undermining the relational, cultural, and environmental foundations on which hospitality depends.

Social, cultural, and ethical implications of AI in hospitality

AI is reshaping the social and ethical landscape of hospitality, a sector defined by interpersonal care, emotional nuance, and culturally embedded service practices. As predictive and automated systems mediate more stages of the guest journey, they redefine expectations of comfort, trust, and connection (Talón-Ballestero et al., 2022; Solnet, 2019). These transformations bring notable benefits but also raise important cultural and ethical questions about authenticity, transparency, and the responsible use of personal data.

One major shift concerns hyper-personalisation. By analysing behavioural, contextual, and transactional data, hotels tailor environmental settings, dining suggestions, and wellness options to individual preferences (Gupta & Pareek, 2024; Kozak & Correia, 2025). Smart-room technologies extend this anticipatory service by adjusting lighting, temperature, and entertainment systems through voice or mobile controls (Aphisavadh, 2025). While these features can enhance guest comfort, their reliance on prediction over interaction raises broader questions about how hospitality expresses care when fulfilment becomes automated rather than relational. This reconfiguration of service also alters the nature of human work.

As routine tasks are delegated to AI, employees increasingly focus on emotional engagement, creative judgement, and complex problem-solving (Limna, 2023; Fazi et al., 2025). Many frameworks position this as human–AI complementarity, where technology supports frontline staff with real-time insights to enhance attentiveness and personal connection (Seyitoğlu, 2021; Turkle, 2007). Yet perceptions of authenticity vary considerably. Some guests welcome seamless automation; others interpret it as impersonal or culturally incongruent (Seyitoğlu, 2021). Generational and cultural differences further influence acceptance, highlighting the need to design service systems that respect diverse expectations and comfort levels (Fazi et al., 2025).

Underlying these preferences is the issue of trust, shaped by transparency, fairness, and perceived competence of AI systems (Du & Xie, 2021). Guests commonly experience a "privacy paradox"; they are willing to share data when benefits are clear but express concern when data practices appear opaque or unnecessarily intrusive (Salih et al., 2025; Nira, 2025). Ethical data stewardship is therefore fundamental. As personalisation increasingly depends on sensitive data, including biometrics and behavioural patterns, robust governance, regulatory compliance, and clear communication become essential safeguards (Bist, 2025; Bahangulu & Owusu-Berko, 2025). Beyond privacy, AI introduces risks of algorithmic bias. Models trained on incomplete or skewed data can produce unequal outcomes in pricing, recruitment, or service recommendations (Sharma et al., 2022; Lee & Sharma, 2025). These concerns require systematic bias audits, inclusive datasets, and ongoing human oversight to prevent discrimination and ensure equitable treatment (Bahangulu & Owusu-Berko, 2025). Transparency in algorithmic decision-making is equally critical, as opaque "black box" systems undermine user confidence, particularly in emotionally sensitive service contexts (Sharma et al., 2022; Du & Xie, 2021). Implementing explainable AI and assigning clear accountability for AI-driven decisions can help preserve trust and align practices with industry values (Binesh & Syah, 2025).

AI's implications extend to employee well-being. Automation can amplify anxieties around job security, workload intensification, and fairness in performance evaluation (Ersoy & Ehtiyar, 2023; Kang et al., 2024). Ethical deployment therefore involves using AI to support, not supplant, human labour. When accompanied by meaningful training, participatory involvement, and career development pathways, AI can reduce repetitive tasks and improve job satisfaction (Buhalis et al., 2019; Turkle, 2007; Abdulmawla et al., 2025). Adaptive learning tools offer additional opportunities to strengthen digital competencies and ensure staff remain confident participants in evolving service systems (Ersoy & Ehtiyar, 2023). At a broader cultural level, AI holds potential to enhance accessibility through multilingual interfaces or adaptive modes that assist neurodiverse guests (Nira, 2025). Yet the global spread of standardised algorithmic systems risks diminishing cultural specificity, especially when datasets embed Western normative assumptions (Reis, 2024). Balancing inclusivity with cultural nuance therefore becomes a central design challenge. Overall, the social, cultural, and ethical implications of AI in hospitality hinge on maintaining human values as technologies become more pervasive. Ensuring fairness, protecting privacy, cultivating transparency, and supporting staff are not only ethical responsibilities but essential to preserving the deeper aims of hospitality: fostering trust, respect, and genuine connection in an increasingly digital environment.

Environmental, regulatory, and contextual challenges of AI in hospitality

Although AI has become central to hospitality's pursuit of sustainability, efficiency, and competitive advantage; yet its environmental footprint, regulatory ambiguity, and organisational constraints reveal a more complex landscape than narratives of "smart" or "green" innovation often imply. The sector must therefore confront the dual challenge of

reducing its own ecological impact while navigating an evolving governance environment where ethical, legal, and infrastructural responsibilities are increasingly intertwined.

Hotels have long struggled with energy-intensive operations, water consumption, and waste generation. AI-supported systems now offer tangible opportunities to address these challenges through more precise, anticipatory, and data-driven environmental management (Jose et al., 2020). Energy Management Systems (EMS) use real-time analytics to optimise heating, cooling, and lighting based on occupancy and external conditions, reducing consumption by up to 20% in some cases (Bakshi & Singh, 2024; Ning, 2024). Predictive maintenance identifies inefficiencies before they escalate (Talón-Ballestero et al., 2022), while large hotel groups such as Hilton have demonstrated the scale of potential savings, with LightStay reporting over $1 billion in combined energy, water, and waste reductions (Zientara et al., 2020). Similar gains are emerging in water conservation, where AI-enabled leak detection systems and behavioural insights improve demand forecasting (Egbemhenghe et al., 2023).

Food waste reduction has also benefited from AI integration. Intelligent monitoring tools help commercial kitchens analyse discarded items, adapt procurement, and align menus more closely with actual consumption (Clark et al., 2025; Aphisavadh, 2025). Generative AI forecasting models refine ordering and inventory management, reducing spoilage and supporting circularity initiatives (Seyitoğlu, 2021; Talón-Ballestero et al., 2022). Hotels are increasingly using AI to track material flows, guide recycling, and strengthen local sourcing, embedding sustainability across routine purchasing decisions (Jose et al., 2020).

However, these localised gains sit uneasily alongside the environmental burdens of AI itself. Training and operating advanced models require energy-hungry data centres whose electricity consumption reached an estimated 415 TWh in 2024, with projections of substantial growth by 2030 (Van Wynsberghe, 2021). Water dependence is equally significant: cooling processes may require up to two litres of water per kilowatt-hour consumed (Berthelot et al., 2025). The sector therefore risks outsourcing part of its carbon and water footprint to external infrastructures, complicating the sustainability claims attached to digital transformation. Transparency around these indirect impacts remains weak. Reporting standards are inconsistent, lifecycle assessments of hardware or model training are rarely disclosed, and emissions associated with data transmission and cloud computation often remain invisible (Van Wynsberghe, 2021). Without clearer environmental accounting, hotels cannot reliably assess the trade-offs inherent in adopting AI technologies.

Alongside environmental concerns, AI in hospitality is unfolding within a regulatory landscape that is fragmented, uneven, and not fully aligned with sector-specific needs. Privacy frameworks such as the GDPR and CCPA provide essential safeguards through requirements on consent, transparency, and protections against harmful automated decisions (Bist, 2025; Voigt & Von dem Bussche, 2017; Bahangulu & Owusu-Berko, 2025). These are especially relevant in a sector reliant on profiling, personalisation, and behavioural prediction.

Yet beyond privacy, regulatory guidance on algorithmic fairness, accountability, and environmental responsibility remains underdeveloped (Binesh & Syah, 2025). This creates a dual risk: under-regulation may enable discriminatory or opaque practices, while over-regulation may stifle innovation or impose disproportionate burdens on smaller operators (Fang et al., 2026). Clearer technical standards, sector-specific guidelines, and collaborative governance models are increasingly needed. Industry consortia and voluntary codes of practice have begun filling this gap, promoting fairness audits, explainability, and sustainable

data governance (Bahangulu & Owusu-Berko, 2025).

Environmental regulation lags even further behind. Despite the growing carbon footprint of AI infrastructures, few jurisdictions require disclosure of the energy or water use associated with cloud services. As hotels outsource computation to large technology firms, the absence of environmental reporting from providers makes it difficult to align digital strategies with sustainability commitments.

The effectiveness of AI in hospitality is also shaped by organisational readiness, cultural attitudes, and infrastructural capacity. Many firms still hold limited or superficial knowledge of AI capabilities, leading either to inflated expectations or hesitation about adoption (Nam et al., 2021). Legacy systems, often non-interoperable PMS, POS, or booking platforms, remain major obstacles to integration (Garcia & Adams, 2022). Financial constraints and uneven digital literacy at management level further slow progress.

Workforce dynamics present an additional layer of complexity. Employee concerns about surveillance, job insecurity, and loss of autonomy may undermine morale and obstruct system uptake (Ersoy & Ehtiyar, 2023). Without participatory governance, clear communication, and reskilling opportunities, AI implementation risks reinforcing workplace inequalities or fostering resistance. A phased, experimental approach is increasingly recommended. Pilot projects, whether in demand forecasting, maintenance, or personalisation, allow organisations to test systems at manageable scale, refine algorithms, and generate internal legitimacy before investing in full deployment (Nam et al., 2021). Such incremental adoption supports staff engagement, reduces operational risk, and builds organisational confidence.

Looking ahead, hospitality is likely to witness deeper integration of AI systems as models learn from expanding data flows and accelerate feedback cycles, amplifying “exponential learning” effects (Garcia & Adams, 2022). Integrated technological ecosystems linking CRM, PMS, POS, IoT networks, and revenue systems will intensify real-time decision-making and personalise services with greater granularity (Limna, 2023; Banerjee, 2024). Yet such integration risks widening the divide between early adopters and technologically constrained firms, potentially reshaping competitive structures. Realising the environmental, operational, or economic benefits of AI requires governance architectures capable of managing its evolving risks. Robust data governance, regular bias audits, explainability standards, and explicit accountability models are fundamental to ensuring fairness and trust (Binesh & Syah, 2025). At the environmental level, the sector must demand clearer reporting from technology providers and prioritise energy-efficient algorithms, renewable-powered data centres, and responsible lifecycle design (Berthelot et al., 2024). Sustainable and ethical AI in hospitality depends on combining technological innovation with organisational maturity and regulatory foresight. By pairing operational benefits with transparency, inclusivity, and ecological responsibility, the industry can move towards more resilient and genuinely sustainable digital futures.

Conclusion

The accelerating incorporation of Artificial Intelligence into hospitality signifies a structural transformation whose implications extend far beyond operational innovation. AI is now entangled with questions of economic justice, labour restructuring, surveillance, environmental degradation, and the shifting cultural meaning of hospitality itself. This makes AI not merely a technological upgrade but a significant socio-technical intervention whose benefits and harms require continuous scrutiny rather than celebratory acceptance.

Economically, AI promises sharper forecasting, streamlined operations, and improved

revenue management, reinforcing its status as a valuable competitive asset. Yet these efficiencies risk entrenching inequality within the sector. Firms with advanced digital infrastructures are accumulating disproportionate data advantages, enabling them to refine flexible pricing, personalise marketing, and optimise labour scheduling in ways that smaller operators cannot match. This "data-driven stratification" (Couldry & Mejias, 2019) raises uncomfortable questions about market concentration and the long-term viability of digitally disadvantaged businesses. The pursuit of efficiency must therefore be tempered by consideration of how technological asymmetries reshape competition and power across the industry.

Socially and culturally, AI-mediated personalisation is redefining guest expectations, creating an illusion of intimacy built on pattern recognition rather than genuine relational engagement. While such precision may enhance convenience, it risks diluting the ethos of hospitality as a domain of spontaneity, empathy, and human presence. An over-reliance on automated service routines can encourage a hollow form of "performative warmth" in which staff are reduced to overseers of algorithmic systems rather than active co-creators of the guest experience. The challenge is not simply to preserve "human touch" in a symbolic sense, but to safeguard the interpretive, emotional, and ethical labour that humans uniquely contribute within complex service encounters (Bolton & Houlihan, 2009).

Ethically, the adoption of AI exposes the sector to forms of algorithmic opacity and digital surveillance that directly affect both workers and guests. Systems used for pricing, security screening, performance monitoring, or recruitment can reproduce hidden biases or make decisions that are difficult to contest (O'Neil, 2017). Without robust oversight mechanisms, these systems risk becoming instruments of unaccountable corporate power. Labour concerns are equally pressing; while automation is often framed as a neutral efficiency tool, yet in practice it redistributes work, intensifies monitoring, and places employees under algorithmic management regimes that may erode autonomy and professional identity (Duggan et al., 2020). Ethical AI in hospitality therefore requires more than compliance, it demands a critical interrogation of how power is exercised through datafied systems.

Environmentally, AI's dual role as both sustainability enabler and environmental burden forces a recalibration of prevailing techno-optimism. While AI-driven optimisation can reduce on-site consumption, these gains are counterbalanced by the escalating energy and water demands of global data infrastructures. The environmental footprint of large-scale model training and the lifecycle impacts of electronic hardware are frequently omitted from sustainability reporting, creating a misleading narrative about AI as inherently "green." Unless the sector adopts principles of "sustainable computation" (Oyewole & Joseph, 2025), including transparent reporting, low-impact design, and renewable-powered data centres, the ecological contradictions of AI will remain unresolved.

Furthermore, fragmented regulatory frameworks and uneven organisational readiness continue to shape the trajectory of AI adoption. Compliance-focused approaches alone are insufficient. What is needed is a governance architecture that questions underlying assumptions about technological inevitability, prioritises fairness and accountability, and acknowledges that AI systems shape, not merely support, organisational culture and decision-making. Building digital capacity must therefore be accompanied by cultivating ethical reflexivity, participatory implementation, and cross-level dialogue that recognises employees and guests as stakeholders rather than data points. Taken together, these tensions indicate that AI's impact on hospitality cannot be reduced to narratives of innovation or threat. AI is reconfiguring what it means to host, to serve, and to relate within an increasingly automated service environment. The sector's future depends on its willingness to interrogate what AI can

do and what it ought to do, and for whom. Organisations that adopt AI critically, transparently, and with an ethic of care will be far better equipped to forge a hospitality model that is technologically sophisticated yet socially just, environmentally responsible, and meaningfully human-centred.

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References

Abdulmawla, M., Menesey, R. M., & Khalaf, S. N. (2025). How Human-centric leadership catalyses employee voice behaviour and employee empowerment in the hospitality industry: The mediating role of job crafting. *Journal of the Faculty of Tourism and Hotels-University of Sadat City, 9*(2/2), 1-28.

Aphisavadh, S. (2025). The impact of artificial intelligence in the global hospitality industry by 2030. *World, 25*(1), 1691-1701.

Bahangulu, J. K., & Owusu-Berko, L. (2025). Algorithmic bias, data ethics, and governance: Ensuring fairness, transparency and compliance in AI-powered business analytics applications. *World J Adv Res Rev, 25*(2), 1746-63.

Bakshi, N., & Singh, A. K. (2024). AI-enabled smart buildings reducing the carbon footprint and enhancing guest experiences in eco-friendly hotels. In *Hotel and Travel Management in the AI Era* (pp. 79-98). IGI Global Scientific Publishing.

Banerjee, S. (2024). Intelligent cloud systems: AI-driven enhancements in scalability and predictive resource management. *International Journal of Advanced Research in Science, Communication and Technology*, 266-276.

Berthelot, A., Caron, E., Jay, M., & Lefèvre, L. (2024). Estimating the environmental impact of Generative-AI services using an LCA-based methodology. *Procedia CIRP, 122*, 707-712.

Berthelot, A., Caron, E., Jay, M., & Lefevre, L. (2025). Understanding the environmental impact of generative AI services. *Communications of the ACM, 68*(7), 46-53.

Binesh, N., & Syah, A. M. (2025). *AI ethics in hospitality and tourism: Theoretical perspectives, ethical beliefs, and actionable outcomes*. OSF Preprints, (akf4z_v1).

Bist, Y. (2025). Data Privacy, Ethics, and the Role of Al in Demystifying Emotion AI, Robotics AI, and Sentiment Analysis in *Customer Relationship Management*, 283.

Bolton, S., & Houlihan, M. (2009). *Work matters: Critical Reflections on Contemporary Work*. Bloomsbury Publishing.

Brougham, D., & Haar, J. (2018). Smart technology, artificial intelligence, robotics, and algorithms (STARA): Employees' perceptions of our future workplace. *Journal of Management & Organisation, 24*(2), 239-257.

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.

Buhalis, D., & Moldavska, I. (2022). Voice assistants in hospitality: using artificial intelligence for customer service. *Journal of Hospitality and Tourism Technology, 13*(3), 386-403.

Bulchand-Gidumal, J. (2022). Impact of artificial intelligence in travel, tourism, and hospitality. In *Handbook of e-Tourism* (pp. 1943-1962). Cham: Springer International Publishing.

Chen, A., Koegel, S., Hannon, O., & Ciriello, R. (2023). Feels like empathy: How "emotional" AI challenges human essence. In *Australasian Conference on Information Systems*.

Clark, Q. M., Kanavikar, D. B., Clark, J., & Donnelly, P. J. (2025). Exploring the potential of AI-driven food waste management strategies used in the hospitality industry for application in household settings. *Frontiers in Artificial Intelligence, 7*, 1429477.

Couldry, N., & Mejias, U. A. (2019). The costs of connection: How data is colonizing human life and appropriating it for capitalism. In *The Costs of Connection*. Stanford University Press.

Crawford, K. (2021). *Atlas of AI: Power, Politics, and the Planetary Costs of Artificial Intelligence*. Yale University Press.

Davenport, T., & Ronanki, R. (2018). Artificial intelligence for the real world. *Harvard Business Review, 96*(1), 108–116.

Doborjeh, Z., Hemmington, N., Doborjeh, M., & Kasabov, N. (2022). Artificial intelligence: a systematic review of methods and applications in hospitality and tourism. International *Journal Of Contemporary Hospitality Management, 34*(3), 1154-1176.

Du, S., & Xie, C. (2021). Paradoxes of artificial intelligence in consumer markets: Ethical challenges and opportunities. *Journal of Business Research, 129*, 961-974.

Dwivedi, Y. K., Helal, M. Y. I., Elgendy, I. A., Albashrawi, M. A., Hughes, L., Shawosh, M., ... & Jeon, I. (2025). Artificial intelligence agents and agentic systems in hospitality and tourism: challenges, opportunities and research agenda. *International Journal of Contemporary Hospitality Management*.

https://doi.org/10.1108/IJCHM-02-2025-0287

Duggan, J., Sherman, U., Carbery, R., & McDonnell, A. (2020). Algorithmic management and app-work in the gig economy: A research agenda for employment relations and HRM. *Human Resource Management Journal, 30*(1), 114-132.

Egbemhenghe, A. U., Ojeyemi, T., Iwuozor, K. O., Emenike, E. C., Ogunsanya, T. I., Anidiobi, S. U., & Adeniyi, A. G. (2023). Revolutionizing water treatment, conservation, and management: Harnessing the power of AI-driven ChatGPT solutions. *Environmental Challenges, 13*, 100782.

Enholm, I. M., Papagiannidis, E., Mikalef, P., & Krogstie, J. (2022). Artificial intelligence and business value: A literature review. *Information systems frontiers, 24*(5), 1709-1734.

Ersoy, A., & Ehtiyar, R. (2023). The impact of artificial intelligence on hospitality employees' work outcomes. *Advances in Hospitality and Tourism Research (AHTR), 11*(4), 505-526.

Ezzaouia, I., & Bulchand-Gidumal, J. (2023). The impact of information technology adoption on hotel performance: Evidence from a developing country. *Journal of Quality*

Assurance in Hospitality & Tourism, 24(5), 688-710.

Fang, M., Le Minh, T., Louie, J., Pham, L. N., & Hewson, C. (2026). Leadership networks: Shaping AI innovations through responsible practices in Vietnamese tourism and hospitality firms. *Tourism Management, 113*, 105317.

Fazi, L., Zaniboni, S., & Wang, M. (2025). Age differences in the adoption of technology at work: a review and recommendations for managerial practice. *Journal of Organisational Change Management, 38*(8), 138-175.

Garcia, A., & Adams, J. (2022). Data-driven decision making: Leveraging analytics and AI for strategic advantage. *Research Studies of Business, 1*(02), 77-85.

Gupta, P., & Pareek, R. (2024). AI-enabled guest experience: disrupting hospitality through next-generation ai technologies. In *Technology and Luxury Hospitality* (pp. 165-181). Routledge.

Henriques, H., & Pereira, L. N. (2024). Hotel demand forecasting models and methods using artificial intelligence: A systematic literature review. *Tourism & Management Studies, 20*(3), 39-51.

Ivanov, S., & Webster, C. (2021). Willingness-to-pay for robot-delivered tourism and hospitality services–an exploratory study. *International Journal of Contemporary Hospitality Management, 33*(11), 3926-3955.

Jose, R., Panigrahi, S. K., Patil, R. A., Fernando, Y., & Ramakrishna, S. (2020). Artificial intelligence-driven circular economy as a key enabler for sustainable energy management. *Materials Circular Economy, 2*(1), 8.

Kang, J., Shin, H., & Kang, C. (2024). Hospitality labour leakage and dynamic turnover behaviours in the age of artificial intelligence and robotics. *Journal of Hospitality and Tourism Technology, 15*(5), 916-933.

Khoa, D. T., Gip, H. Q., Guchait, P., & Wang, C. Y. (2023). Competition or collabouration for human–robot relationship: a critical reflection on future cobotics in hospitality. *International Journal of Contemporary Hospitality Management, 35*(6), 2202-2215.

Kozak, M., & Correia, A. (2025). From mass marketing to personalised digital marketing in tourism: a 2050 horizon paper. *Tourism Review, 80*(1), 373-391.

Ladeira, W., Perin, M. G., & Santini, F. (2023). Acceptance of service robots: A meta-analysis in the hospitality and tourism industry. *Journal of Hospitality Marketing & Management, 32*(6), 694-716.

Lee, S. W., & Sharma, A. (2025). AI versus human-generated hotel pricing: Unpacking consumer perceptions of trustworthiness and fairness. *Tourism Economics*, 13548166251391486.

Limna, P. (2023). Artificial Intelligence (AI) in the hospitality industry: A review article. *International Journal of Computing Sciences Research, 7*, 1306-1317.

Liu, J., Qian, Y., Yang, Y., & Yang, Z. (2022). Can artificial intelligence improve the energy efficiency of manufacturing companies? Evidence from China. *International Journal of Environmental Research and Public Health, 19*(4), 2091.

Mariani, M. (2020). Big data and analytics in tourism and hospitality: a perspective article. *Tourism Review, 75*(1), 299-303.

Martin, K., & Nissenbaum, H. (2020). What is it about location? *Berkeley Technology Law Journal, 35*(1), 251-326.

Nam, K., Dutt, C. S., Chathoth, P., Daghfous, A., & Khan, M. S. (2021). The adoption of artificial intelligence and robotics in the hotel industry: prospects and challenges. *Electronic Markets, 31*(3), 553-574.

Ning, M. A. (2024). Artificial intelligence-driven decision support systems for sustainable energy management in smart cities. *International Journal of Advanced Computer Science & Applications, 15*(9).

Nira, R. A. (2025). AI-driven hyper-personalisation in hospitality: application, present and future opportunities, challenges, and guest trust issues. *International Journal of Research and Innovation in Social Science, 9*(4), 5562-5573.

O'Connor, P., & Murphy, J. (2004). Research on information technology in the hospitality industry. *International Journal of Hospitality Management, 23*(5), 473-484.

O'neil, C. (2017). *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy*. Crown.

Orlikowski, W. J., & Iacono, C. S. (2001). Research commentary: Desperately seeking the "IT" in IT research-A call to theorizing the IT artifact. *Information systems research, 12*(2), 121-134.

Onyeaka, H., Tamasiga, P., Nwauzoma, U. M., Miri, T., Juliet, U. C., Nwaiwu, O., & Akinsemolu, A. A. (2023). Using artificial intelligence to tackle food waste and enhance the circular economy: Maximising resource efficiency and minimising environmental impact: A review. *Sustainability, 15*(13), 10482.

Oyewole, O. O., & Joseph, J. F. (2025). Sustainable AI and green computing: Reducing the environmental impact of large-scale models with energy-efficient techniques. International *Journal of Scientific Research in Network Security and Communication, 13*(3), 19-26.

Reis, J. (2024). Customer service through AI-powered human-robot relationships: Where are we now? The case of Henn na cafe, Japan. Technology in Society, 77, 102570.

Salih, L., Tarhini, A., & Acikgoz, F. (2025). AI-Enabled service continuance: roles of trust and privacy risk. *Journal of Computer Information Systems*, 1-16.

Shaik, M. (2023). Predictive maintenance in hospitality using ai and aws bedrock. *International Journal of Leading Research Publication, 4*(2), 1-10.

Seyitoğlu, F. (2021). Automation vs authenticity in services. *ROBONOMICS: The Journal of the Automated Economy, 2*, 20-20.

Sharma, S., Rawal, Y. S., Pal, S., & Dani, R. (2022). Fairness, accountability, sustainability, transparency (FAST) of artificial intelligence in terms of hospitality industry. In *ICT Analysis and Applications* (pp. 495-504). Singapore: Springer Nature Singapore.

Shestakofsky, B. (2017). Working algorithms: Software automation and the future of work. *Work and Occupations, 44*(4), 376-423.

Shi, X., Hao, F., & Yuan, Y. (2025). Long-term effects of AI-powered robots on employee creativity in the hospitality industry: psychological mechanisms of human–AI collabouration. *Journal of Hospitality Marketing & Management*, 1-23.

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines.

Journal of Business Research, 104, 333–339.

Solnet, D., Subramony, M., Ford, R. C., Golubovskaya, M., Kang, H. J., & Hancer, M. (2019). Leveraging human touch in service interactions: Lessons from hospitality. *Journal of Service Management, 30*(3), 392-409.

Stankov, U., Gretzel, U., Vujičić, M. D., Pavluković, V., Jovanović, T., Solarević, M., & Cimbaljević, M. (2022). The pandemic of loneliness: designing smart tourism for combating loneliness. *Information Technology & Tourism, 24*(4), 439-455.

Turkle, S. (2007). Authenticity in the age of digital companions. *Interaction studies, 8*(3), 501-517.

Talón-Ballestero, P., Nieto-García, M., & González-Serrano, L. (2022). The wheel of dynamic pricing: Towards open pricing and one to one pricing in hotel revenue management. *International journal of hospitality management, 102*, 103184.

Thomas, J., & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Medical Research Methodology, 8*(1), 45.

Torraco, R. J. (2016). Writing integrative literature reviews: Using the past and present to explore the future. *Human Resource Development Review, 15*(4), 404-428.

Tussyadiah, I. (2020). A review of research into automation in tourism and hospitality. *Annals of Tourism Research, 81*, 102883.

Van Wynsberghe, A. (2021). Sustainable AI: AI for sustainability and the sustainability of AI. *AI and Ethics, 1*(3), 213-218.

Voigt, P., & Von dem Bussche, A. (2017). *The EU General Data Protection Regulation (Gdpr). A Practical Guide, 1st ed.*, Cham: Springer International Publishing, 10(3152676), 10-5555.

Wang, Q., Li, Y., & Li, R. (2024). Ecological footprints, carbon emissions, and energy transitions: the impact of artificial intelligence (AI). *Humanities and Social Sciences Communications, 11*(1), 1-18.

Whittemore, R., & Knafl, K. (2005). The integrative review: updated methodology. *Journal of Advanced Nursing, 52*(5), 546-553.

Zientara, P., Bohdanowicz-Godfrey, P., Whitely, C., & Maciejewski, G. (2020). A case study of LightStay (2010–2017)—Hilton's corporate responsibility management system. *Energies, 13*(9), 2303.

Zhang, B., Pu, Y., Wang, Y., & Li, J. (2019). Forecasting hotel accommodation demand based on LSTM model incorporating internet search index. *Sustainability, 11*(17), 4708.

Zuboff, S. (2019). *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*. PublicAffairs, New York.