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## **AI AND TRANSFORMATION OF SPA MANAGEMENT: KEY ETHICAL CONSIDERATIONS**

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### **Abstract**

*This paper reviews available scientific literature on how artificial intelligence (AI) is transforming spa management and highlights core ethical considerations for responsible adoption. AI enables personalized wellness recommendations, demand forecasting, dynamic pricing, energy optimization, predictive maintenance, and automation of scheduling and customer service, potentially improving service quality and operational efficiency. These benefits raise ethical AI issues including fairness in personalization and pricing, explainability of recommendations, bias in customer profiling, and accountability for harm when automated decisions affect access to services. Data privacy is critical because spa settings involve sensitive health, biometric, and behavioral data; key requirements include data minimization, purpose limitation, secure storage, informed consent, and careful governance of third-party vendors and cross-border data flows. Integration challenges include interoperability with legacy booking and facility systems, cybersecurity risks, staff training, and managing model drift over time. Findings of the review are consolidated into the SPA-ETHICS Governance Framework, which operationalizes eight ethical pillars (transparency, accuracy, data privacy, accountability, non-deception, fairness, human oversight, and responsibility) across the spa AI lifecycle by linking use cases to controls, decision rights, escalation pathways, and audit mechanisms. The review highlights the need for human oversight and continuous monitoring to preserve integrity, trust, and safety in AI-enabled spa operations.*

**Key Words:** *artificial intelligence, spa management, AI governance, ethical AI, data privacy, fairness, transparency, human oversight*

**JEL Classification:** /

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## **Introduction and literature review**

Artificial intelligence is increasingly embedded in service industries through automation, prediction, and personalization (Bhuiyan, 2024). In spa management, AI is rapidly moving beyond a supporting technology toward a decision-shaping infrastructure that affects how customers are acquired, scheduled, served, retained, and priced (Niederwolfsgruber, 2026). This transformation is publicly visible in customer facing functions and services, such as AI chatbots and recommendation engines. However, it extends to operational functions as well, through demand forecasting, energy management, and maintenance planning (Henriques & Pereira, 2024). These applications of AI can improve service availability, increase operational efficiency, and optimize resource allocation. At the same time, they increase the velocity and scale of decisions, intensify data collection, and create new modes of influence through AI-mediated communication (Buhalis & Moldavska, 2022).

From an AI governance perspective, spas represent a high-trust environment where customers may share intimate preferences and sensitive data. Even when spa data are not fully regulated as clinical medical records, they frequently include sensitive personal information that could cause harm if disclosed, misused, or interpreted incorrectly (Koranteng et al., 2025). Thus, ethical use of AI is an imperative for future technological integration in spa management. The AI ethics aims either to explain new concepts related to AI, or to explain ethically important acting of AI technology (Lambrecht & Moreno, 2024). Literature findings indicate that AI ethics considerations frequently converge around principles such as privacy, transparency, fairness, accountability, and human oversight (Verčič et al., 2025). UNESCO (2022) AI ethics recommendations consolidate core principles into a globally adopted set of recommendations that emphasize privacy and data protection, transparency and explainability, responsibility and accountability, and human oversight and determination. However, literature argues that ethical principles alone cannot guarantee ethical AI: governance must translate principles into clear processes and decision rights (Mittelstadt, 2019). In the spa context, AI-mediated communication with customers may include chatbot conversations about booking, treatment options, automated follow-ups, personalized offers, and generative marketing content. These functions can improve responsiveness but can also introduce risks of misinformation, exaggerated claims, or customer manipulation if the system of AI governance is not designed in a systemic manner.

Data privacy is consistently identified in the literature as especially important ethical challenge in AI systems, particularly when AI depends on profiling and collecting personal data and user experiences (Martin & Zimmermann, 2024). Spa operations can involve myriads of data that can be critical from privacy perspective: payment data, scheduling patterns, customer preferences, medical records, and notes that may imply health status or sensitive personal circumstances. AI-driven personalization and customer analytics can also be sensitive, and additional data security measures might be required to protect personal data of the users (Bhuiyan, 2024). UNESCO (2022) AI ethics recommendations emphasize the right to privacy and data protection. In this context, ethical AI governance for spas should address both privacy concerns and third-party data management. Effective privacy governance requires data minimization, purpose limitation, secure storage, access controls, retention schedules, and customer rights processes (Purohit et al., 2024). Governance should also address third-party vendors and cross-border data flows. This is relevant as many booking, CRM, and AI tools are hosted internationally and without direct control of spa management. Transparency and explainability are increasingly framed as requirements that connect ethical commitments to practical accountability (Balasubramaniam et al., 2023). In spa management, transparency is specifically relevant both in organizational context and in terms of communication with customers. At the same time, AI transparency also has an organizational component. Explainability should be proportionate and comprehensible, focusing on practical drivers and ability to interpret and explain. Spa and wellness customers need to get accurate guidance and, in case of material mistakes, may misinterpret AI-generated outputs. Inaccurate recommendations, misleading claims, or hallucinated content can cause operational and/or reputational harm through inappropriate service selection, operational challenges, financial losses, or erosion of trust (Okonkwo et al., 2025). AI governance for accuracy therefore needs content checks, approved and factually true sources, and reviewed processes, especially in the domain of high-risk communications. This aligns with ethical AI guidance in public relations emphasizing accuracy and safeguards against falsehood when AI generates or amplifies content (Verčič et al., 2025). Moreover, UNESCO (2022) treats fairness and non-discrimination as core ethical AI concerns. In spa management, fairness risks may arise when AI systems are used to segment customers for offers, prioritize appointments, determine membership benefits, or apply dynamic pricing. Governance mechanisms should include fairness testing on outcomes and ongoing monitoring to detect possible discriminatory or

unfair patterns of AI systems. Although human oversight is widely endorsed, research shows that it can be ineffective if it is purely procedural or if staff assigned does not have time, authority, or understanding to challenge AI outputs. In spa settings, meaningful oversight requires clear criteria for when human review is mandatory. Thus, human oversight should assign the employees the ability to override AI decisions and include training to identify errors and escalate issues (Frenette, 2023). Professional guidance also frames human oversight and responsibility as central safeguards in AI-mediated stakeholder communication (Verčič et al., 2025).

### **Methodology**

This study uses a structured review of scientific literature, published between 2020 and 2025, with the inclusion of available public sources relevant to AI ethics and governance. The review focuses on the research addressing key AI ethics issues, such as transparency and explainability, data privacy and protection, accountability and governance mechanisms, fairness and non-discrimination, non-deception risks from generative AI, and human oversight effectiveness. Given the limited volume of spa-specific research, the review adopts a cross-disciplinary perspective and draws on literature from AI ethics, AI governance, hospitality management, tourism management, service automation, data privacy, and AI-mediated communication. The approach is aligned with systematic review practices used in AI-related management research (Ljepava, 2022). The review is performed between January and March 2026.

Academic literature was searched in Scopus, Web of Science Core Collection, Google Scholar, ScienceDirect, SpringerLink, and IEEE Xplore databases. Search logic combined AI-related terms (artificial intelligence, AI, Generative AI, machine learning, chatbot), sector and application terms (spa management, wellness services, hospitality, personalization, dynamic pricing, predictive maintenance), and governance-related terms (AI ethics, AI governance, transparency, fairness, accountability, privacy, human oversight, non-deception).

Sources were included in the review if they were published in English; fell within the defined time frame; were peer-reviewed journal articles, conference papers, scholarly book chapters, doctoral dissertations, or eligible public-source documents; and addressed AI ethics, AI governance, privacy, transparency, fairness, accountability, human

oversight, or AI applications relevant to spa and hospitality management contexts. Sources were excluded if they were duplicates, non-English, purely technical without governance relevance, unrelated to the research topic, or lacking sufficient relevance or credibility.

Screening procedure consisted of four stages: identification, deduplication, title and abstract screening, and full-text review. The final sample included 48 academic articles and 15 public-source documents. Public sources were included only when issued by authoritative institutions, such as intergovernmental organizations, regulatory bodies, standards-setting institutions, or recognized professional associations, and when they provided relevant guidance on AI ethics.

The thematic synthesis has been used to identify recurring AI governance pillars and map them to key spa management elements. This process resulted in the identification of eight core pillars: transparency, accuracy, data privacy, accountability, non-deception, fairness, human oversight, and responsibility. The final output is a synthesized set of ethical pillars and a proposed governance framework tailored to the spa sector AI use cases.

**Findings: AI transformation in spas and key governance requirements**

The reviewed literature supports the thesis that AI enabled a structural shift in service management by scaling decision-making and communication. Findings of the review indicate that possibilities for AI adoption in spa management are particularly visible in six application areas as shown in the Table 1:

Table 1: *Areas of possible AI-powered advancements in spa management*

| Area of improvement                            |
|------------------------------------------------|
| Personalization of wellness recommendations    |
| Demand forecasting                             |
| Dynamic pricing and offer optimization         |
| Energy consumption optimization                |
| Predictive maintenance                         |
| Automation of scheduling and customer services |

Source: *Author’s own work*

Personalized wellness recommendations are used to suggest treatments, packages, and products based on customer preferences, history, and

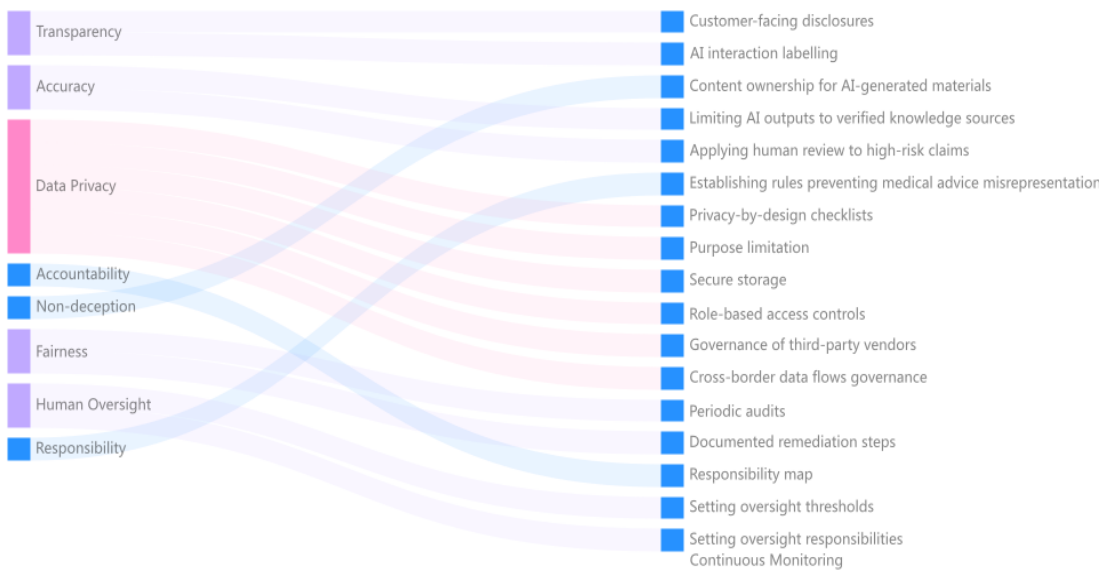
sometimes inferred needs. This can increase relevance and customer satisfaction, but needs to be handled carefully, as it has the potential of increasing privacy risks (Gkintoni et al., 2023). Thus, further AI-powered personalization of wellness recommendations requires clearly defined governance boundaries on sensitive data and confidential health advice. AI-powered demand forecasting is used to predict booking volumes by season, day, and hour, supporting staffing, inventory, and facility planning. While primarily operational, forecasting affects customer access indirectly through staffing levels and scheduling availability, and it can also impact dynamic pricing (Marcus, 2025). Dynamic pricing and offer optimization aim to match demand with capacity and optimize revenue generation. This application of AI is ethically sensitive as well from fairness and accuracy perspectives (Verčič et al., 2025). Therefore, AI governance mechanisms must prioritize fairness testing, explainability of pricing strategies where applicable, and human oversight for significant price shifts or customer-level targeting. Energy consumption optimization can reduce costs and support sustainability goals with the help of artificial intelligence (Johnson, 2025). Therefore, AI governance should predominantly focus on cybersecurity and safety, as possible failures or attacks can negatively impact operations, and consequently affect comfort and safety of the customers. AI-powered predictive maintenance can enhance service continuity and safety (Shaik, 2025). Governance needs to ensure secure handling of operational data and clear accountability when automated alerts are missed, misinterpreted, or not addressed promptly or properly. Automation of scheduling and customer service through chatbots and workflow tools can improve responsiveness and reduce staff workload, but it shifts customer interactions into AI-mediated channels (Marcus, 2025). Thus, AI governance mechanisms need to include clear transparency, non-deception, and escalation pathways to a human when needed. Obviously, transformative role of AI is twofold: is both managerial and technical. It changes the way spa services are delivered, how operations are executed, how customers are profiled, impacts customer experience, and how decisions are made and justified. Governance must therefore be comprehensive and address both customer-facing and operational / back-office / third-party managed AI systems. Based on the review of available literature and public sources, and synthesizing UNESCO's ethical principles (UNESCO, 2022) with AI governance pillars elaborated and developed in related fields (Balasubramaniam et al., 2023; Cheong, 2024; Mittelstadt, 2019), eight AI ethics principles emerge as central for spa management AI

governance: transparency, accuracy, data privacy, accountability, non-deception, fairness, human oversight, and responsibility.

In spa management, transparency means customers should be aware when AI is involved in recommendations, conversations, or content creation, and managers should maintain traceability and evidence record of AI-driven decisions (Żywiołek, 2024). Accuracy requires controls to prevent misleading claims and to reduce the risk of errors from generative AI systems (Thorne, 2024). Data privacy requires minimizing sensitive data collection, clearly defining purpose and retention, securing storage and access, and governing third-party and cross-border actions (Ali, 2024). Accountability requires clear assignment of responsibility for AI configuration, monitoring, and impact on customer interaction and services, as well as mechanisms to rectify errors and manage risks and possible harms (Verčič et al., 2025). Non-deception requires that AI not be used to mislead customers about content authenticity, expected outcomes, or whether they are interacting with a human or an automated system (Sarkadi et al., 2023). Fairness requires monitoring for discriminatory outcomes in personalization, segmentation, access, and pricing. Human oversight requires meaningful human intervention capability, especially for high-impact decisions (Frenette, 2023).

To convert the pillars into implementable practice, this paper proposes the SPA-ETHICS Governance Framework, a lifecycle governance framework linking spa AI use cases to pillar-based controls and decision rights. The framework is based on the review of literature described within this research. It is grouping spa AI deployments into governance domains: customer engagement automation, personalization and recommendation systems, pricing and revenue optimization, operational optimization including energy systems, predictive maintenance and facility reliability, and generative AI for marketing and customer communication. Each domain is evaluated against the eight ethical AI pillars identified in this research, and the evaluation is translated into clear control mechanisms that are auditable and assignable. Continuous monitoring is integrated to detect framework performance, possible issues, and emerging harms over time. SPA-ETHICS governance framework is shown in the Graph 1.

Figure 1: SPA-ETHICS governance framework



Source: *Author's own work*

The framework's governance contribution is that it organizes spa AI as a structured system of decisions and communications that must be traceable, contestable, and correctable. AI is observed from governance perspective as a comprehensive construct with multiple dimensions, not as a standalone tool.

### Conclusions, limitations, and recommendations for future research

AI is transforming spa management by enabling personalization, automating customer interactions, and optimizing operations including demand, pricing, energy use, and maintenance. These transformations can improve service quality and efficiency but introduce governance risks related to privacy, fairness, explainability, deception, and accountability. Because spas operate as high-trust environments and can involve sensitive health, biometric, and behavioral data, responsible adoption depends on rigorous data governance, customer-facing transparency, and meaningful human oversight. The paper synthesizes eight ethical pillars for spa AI governance: transparency, accuracy, data privacy, accountability, non-deception, fairness, human oversight, and responsibility, and proposes the SPA-ETHICS Governance Framework to operationalize these pillars across the spa AI lifecycle.

This study has several limitations. First, the literature specifically addressing AI governance in spa management is still limited, which required the inclusion of the sources from other fields such as hospitality, tourism, service management, and AI ethics, potentially reducing sector-specific accuracy. Second, the review is based on a structured but non-meta-analytic synthesis of heterogeneous academic and public sources: therefore, findings should be interpreted as conceptually integrative rather than statistically generalizable. Third, the fast pace of AI development means that new technologies, regulatory changes, and industry practices may render some observations described in this paper outdated. Finally, the proposed SPA-ETHICS framework has not yet been empirically validated in real spa organizations, so its practical effectiveness remains to be tested through future case studies and applied assessments. Future research should validate the framework through empirical case studies of spa organizations, including audits of various elements, such as dynamic pricing fairness, privacy issues management, and the effectiveness of oversight and escalation pathways in real-life, real-time customer interactions. Specific attention should be given to testing fairness in dynamic pricing and personalization systems, privacy governance for sensitive customer data, and the effectiveness of human oversight and escalation mechanisms in live customer interactions. Further studies could also examine customer perceptions of AI transparency and trust in spa management, employee readiness to supervise AI-supported processes, and the governance implications of third-party vendor dependence and cross-border data flows. Longitudinal research would be especially valuable for assessing how AI risks, controls, and governance needs evolve over time as spa organizations adopt more advanced AI applications.

### **Notes**

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### **References**

1. Ali, A. (2024). Artificial intelligence and data privacy: balancing innovation with security. *Frontiers in Artificial Intelligence Research*, 1(2), 289–328. <https://doi.org/10.71465/fair44>

2. Balasubramaniam, N., Kauppinen, M., Rannisto, A., Hiekkänen, K., & Kujala, S. (2023). Transparency and explainability of AI systems: From ethical guidelines to requirements. *Information and Software Technology*, 159(1), 107197. <https://doi.org/10.1016/j.infsof.2023.107197>
3. Bhuiyan, M. S. (2024). The role of AI-enhanced personalization in customer experiences. *Journal of Computer Science and Technology Studies*, 6(1), 162–169. <https://doi.org/10.32996/jcsts.2024.6.1.17>
4. 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. <https://doi.org/10.1108/JHTT-03-2021-0104>
5. Cheong, B. C. (2024). Transparency and accountability in AI systems: safeguarding wellbeing in the age of algorithmic decision-making. *Frontiers in Human Dynamics*, 6(1), 1421273. <https://doi.org/10.3389/fhumd.2024.1421273>
6. Frenette, J. (2023). Ensuring human oversight in high-performance AI systems: A framework for control and accountability. *World Journal of Advanced Research and Reviews*, 20(2), 1507–1516. <https://doi.org/10.30574/wjarr.2023.20.2.2194>
7. Gkintoni, E., Telonis, G., Tsimakis, A., Halkiopoulos, C., & Boutsinas, B. (2024). Integrating AI-powered personalization via neurobiologically informed DBT in smart wellness resorts. In *International conference of the international association of cultural and digital tourism* (pp. 923–953). Springer Nature. [https://doi.org/10.1007/978-3-031-78471-2\\_40](https://doi.org/10.1007/978-3-031-78471-2_40)
8. 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. <https://doi.org/10.18089/tms.20240304>
9. Johnson, J. (2025). *The Impact of AI-Powered Technologies on Customer Satisfaction and Operational Efficiency in the Hospitality Industry* [Doctoral dissertation, National College of Ireland].
10. Koranteng, A., Adongo, C. A., Osei, C. A., & Dayour, F. (2025). What happens at Trinity Spa stays at Trinity Spa: spa-goers' privacy

expectations. *International Journal of Spa and Wellness*, 8(3), 576–598. <https://doi.org/10.1080/24721735.2025.2543690>

11. Lambrecht, F., & Moreno, M. (2024). What is AI ethics?. *American Philosophical Quarterly*, 61(4), 387–401. <https://doi.org/10.5406/21521123.61.4.07>

12. Ljepava, N. (2022). AI-enabled marketing solutions in marketing decision making: AI application in different stages of marketing process. *Tem Journal*, 11(3), 1308–1315. <https://doi.org/10.18421/TEM113-40>

13. Marcus, A. (2025). Artificial intelligence in hospitality service delivery. *Journal of Hospitality*, 7(1), 13–31.

14. Martin, K. D., & Zimmermann, J. (2024). Artificial intelligence and its implications for data privacy. *Current Opinion in Psychology*, 58(1), 101829. <https://doi.org/10.1016/j.copsyc.2024.101829>

15. Mittelstadt, B. (2019). Principles alone cannot guarantee ethical AI. *Nature machine intelligence*, 1(11), 501–507. <https://doi.org/10.1038/s42256-019-0114-4>

16. Niederwolfsgruber, F. (2026). *AI Process Automation in Customer Service in the Tourism Industry* [Doctoral dissertation, Libera Università di Bolzano].

17. Okonkwo, R., Folorunso, A., Ogundipe, F., & Tettey, C. Y. (2025). Explainable Artificial Intelligence (AI) through human-AI collaborative frameworks: Quantifying trust and interpretability in high-stakes decisions. *Comput. Sci. IT Res. j*, 6(5), 333–354. <https://doi.org/10.51594/csitjr.v6i5.1934>

18. Osei-Mensah, B., Asiamah, E. O., & Sackey, R. (2023). Strategic communication and artificial intelligence: Reviewing emerging innovations and future directions. *Archives of Business Research*, 11(1), 85–102. <https://doi.org/10.14738/abr.111.13616>

19. Purohit, P., Al Nuaimi, F., & Nakkolakkal, S. (2024, May). Data Governance, Privacy, Data Sharing Challenges. In *SPE Gas & Oil Technology Showcase and Conference* (p. D021S031R001). SPE. <https://doi.org/10.2118/219172-MS>

20. Sarkadi, S., Mei, P., & Awad, E. (2023, May). Should my agent lie for me? public moral perspectives on deceptive AI. In *International Conference on Autonomous Agents and Multiagent Systems* (pp. 151–179). Cham: Springer Nature Switzerland. [https://doi.org/10.1007/978-3-031-56255-6\\_9](https://doi.org/10.1007/978-3-031-56255-6_9)
21. Shaik, M. (2023). Predictive maintenance in hospitality using ai and aws bedrock. *IJLRP-International Journal of Leading Research Publication*, 4(2), 1–10.
22. Thorne, S. (2024). Understanding the interplay between trust, reliability, and human factors in the age of generative AI. *International Journal of Simulation--Systems, Science & Technology*, 25(1). <https://doi.org/10.5013/IJSSST.a.25.01.10>
23. UNESCO. (2022). *Recommendation on the ethics of artificial intelligence*. Retrieved April 2, 2026, from: <https://www.unesco.org/en/articles/recommendation-ethics-artificial-intelligence>
24. Verčič, D., Selaković, M., Hung-Baesecke, F., Cheng, Y., Verčič, A. T., Ljepava, N., & Stavreva, S. (2025). *Ethical Standards and Guidelines For the Use of Artificial Intelligence in Public Relations*. IPRA.
25. Żywiołek, J. (2024). Empirical examination of ai-powered decision support systems: ensuring trust and transparency in information and knowledge security. *Zeszyty Naukowe. Organizacja i Zarządzanie/Politechnika Śląska*, 197(1), 679–695. <https://doi.org/10.29119/1641-3466.2024.197.37>