




Employee Perceptions of BI and AI Tools for Service Transformation: Evidence from the Serbian Airline and Hotel Industries

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References

- [1] M. D. Petrović, T. Gajić, I. D. Turgel, M. M. Radovanović, and E. D. Bugrova, "Fostering sustainable urban tourism in predominantly industrial small-sized cities (SSCs) – Focusing on two selected locations," *Sustainability*, vol. 16, no. 14, p. 6086, 2024, doi: 10.3390/su16146086.
- [2] D. Buhalis, "Technology in tourism—from information communication technologies to eTourism and smart tourism towards ambient intelligence tourism: A perspective article," *Tourism Review*, vol. 75, no. 1, pp. 267–272, 2020, doi: 10.1108/TR-06-2019-0258.
- [3] M. Li, D. Yin, H. Qiu, and B. Bai, "A systematic review of AI technology-based service encounters: Implications for hospitality and tourism operations," *International Journal of Hospitality Management*, vol. 95, p. 102930, 2021, doi: 10.1016/j.ijhm.2021.102930.
- [4] X. Zhai, C. S. Chai, M. S. Y. Jong, A. Istenic, M. Spector, J. B. Liu, J. Yuan, and Y. Li, "A review of artificial intelligence (AI) in education from 2010 to 2020," *Complexity*, vol. 2021, pp. 1–18, 2021, doi: 10.1155/2021/8812542.
- [5] T. Gajić, A. Ranjbaran, D. Vukolić, J. Bugarčić, A. Spasojević, J. Đorđević, et al., "Tourists' willingness to adopt AI in hospitality—Assumption of sustainability in developing countries," *Sustainability*, vol. 16, no. 9, p. 3663, 2024, doi: 10.3390/su16093663.
- [6] T. Gajić, D. Vukolić, J. Bugarčić, F. Đoković, A. Spasojević, S. Knežević, et al., "The adoption of artificial intelligence in Serbian hospitality: A potential path to sustainable practice," *Sustainability*, vol. 16, no. 8, p. 3172, 2024, doi: 10.3390/su16083172.
- [7] K. Kim, K. K. F. So, and J. Wirtz, "Service robots: Applying social exchange theory to better understand human-robot interactions," *Tourism Management*, vol. 92, p. 104537, 2022, doi: 10.1016/j.tourman.2022.104537.
- [8] L. P. P. Loe and S. Nagalingham, "Visualization of business intelligence insights into aviation accidents," *International Journal of Advanced Computer Science and Applications*, vol. 14, no. 1, 2023, doi: 10.14569/IJACSA.2023.0140194.
- [9] A. Tuomi, I. P. Tussyadiah, and J. Stienmetz, "Applications and implications of service robots in hospitality," *Cornell Hospitality Quarterly*, vol. 62, no. 2, pp. 232–247, 2021, doi: 10.1177/193896552092396.
- [10] N. Rezaee, S. M. Zanjirchi, N. Jalilian, and S. M. Hosseini Bamakan, "Internet of things empowering operations management: A systematic review based on bibliometric and content analysis," *Telematics and Informatics Reports*, pp. 1–11, 2023, doi: 10.1016/j.teler.2023.100096.
- [11] M. Cardoso, E. Ares, L. Pinto Ferreira, and G. Pelaez, "Using Index Function and Artificial Intelligence to assess Sustainability: A Bibliometric analysis", *International Journal of Industrial Engineering and Management*, vol. 14, no. 4, pp. 311–325, 2023, doi: 10.24867/IJIEM-2023-4-341.
- [12] T. R. Wanasinghe, R. G. Gosine, L. A. James, G. K. I. Mann, O. de Silva, and P. J. Warrian, "The Internet of Things in the Oil and Gas Industry: A Systematic Review," *IEEE Internet of Things Journal*, vol. 7, pp. 8654–8673, 2020, doi: 10.1109/JIOT.2020.2995617.

- [13] M. H. Huang and R. T. Rust, "A strategic framework for artificial intelligence in marketing," *Journal of the Academy of Marketing Science*, vol. 49, no. 1, pp. 30–50, 2021, doi: 10.1007/s11747-020-00749-9.
- [14] Y. Duan, J. S. Edwards, and Y. K. Dwivedi, "Artificial intelligence for decision making in the era of Big Data—evolution, challenges and research agenda," *International Journal of Information Management*, vol. 48, pp. 63–71, 2019, doi: 10.1016/j.ijinfomgt.2019.01.021.
- [15] M. Mutuku and S. Muathe, "Nexus Analysis: Internet of Things and Business Performance," *International Journal of Research in Business and Social Science*, vol. 9, no. 4, pp. 175–181, 2020, doi: 10.20525/ijrbs.v9i4.726.
- [16] G. McCartney and A. McCartney, "Rise of the machines: Towards a conceptual service-robot research framework for the hospitality and tourism industry," *International Journal of Contemporary Hospitality Management*, vol. 32, no. 12, pp. 3835–3851, 2020, doi: 10.1108/IJCHM-05-2020-0450.
- [17] D. E. Bock, J. S. Wolter, and O. C. Ferrell, "Artificial intelligence: Disrupting what we know about services," *Journal of Services Marketing*, vol. 34, no. 3, pp. 317–334, 2020, doi: 10.1108/JSM-01-2019-0047.
- [18] M. B. Saydam, H. E. Arici, and M. A. Koseoglu, "How does the tourism and hospitality industry use artificial intelligence? A review of empirical studies and future research agenda," *Journal of Hospitality Marketing & Management*, vol. 31, no. 8, pp. 908–936, 2022, doi: 10.1080/19368623.2022.2118923.
- [19] R. Praba, T. T. Nisha, S. S. Yazhini, and M. S. Keerthana, "Customer satisfaction analysis in hotels using Power BI," *International Journal of Scientific Research in Computer Science Engineering and Information Technology*, vol. 10, no. 2, pp. 242–248, 2024, doi: 10.32628/CSEIT2410216.
- [20] M. Mariani, R. Baggio, M. Fuchs, and W. Höpken, "Business intelligence and big data in hospitality and tourism: a systematic literature review," *International Journal of Contemporary Hospitality Management*, vol. 30, no. 12, pp. 3514–3554, 2018, doi: 10.1108/IJCHM-07-2017-0461.
- [21] D. K. Priatna, W. Roswinna, N. Limakrisna, A. Khalikov, D. Abdullaev, and L. Hussein, "Optimizing Smart Manufacturing Processes and Human Resource Management through Machine Learning Algorithms," *International Journal of Industrial Engineering and Management*, p. article in press, 2025, doi: 10.24867/IJIEEM-382.
- [22] S. Ivanov and C. Webster, "The impact of automation on employment: Just the usual structural change?" *Sustainability*, vol. 10, no. 5, p. 1661, 2017, doi: 10.3390/su10051661.
- [23] S. Y. Yang and M. F. Zhang, "Blockchain-driven optimization in intelligent manufacturing," *International Journal of Simulation Modelling*, vol. 22, no. 2, pp. 350–361, 2023, doi: 10.2507/IJSIMM22-2-CO10.
- [24] W. Höpken and M. Fuchs, "Business intelligence in tourism," in *Handbook of e-Tourism*, 2021, doi: 10.1007/978-3-030-05324-6_3-1.
- [25] B. Z. Filipiak, M. Dylewski, and M. Kalinowski, "Economic development trends in the EU tourism industry: Towards the digitalization process and sustainability," *Quality & Quantity*, pp. 1–26, 2020, doi: 10.1007/s11135-020-01056-9.
- [26] J. A. Guerra-Montenegro, J. S. Medina, I. Laña, D. Sánchez-Rodríguez, I. G. Alonso-González, and J. Ser, "Computational intelligence in the hospitality industry: A systematic literature review and a prospect of challenges," *Applied Soft Computing*, vol. 102, p. 107082, 2021, doi: 10.1016/j.asoc.2021.107082.
- [27] S. Siau and W. Wang, "Artificial intelligence (AI) ethics: Ethics of AI and ethical AI," *Journal of Database Management*, vol. 31, no. 2, pp. 74–87, 2020, doi: 10.4018/JDM.2020040105.
- [28] K. A. Chernyshev, I. N. Alov, Y. Li, and T. Gajić, "How real is migration's contribution to the population change in major urban agglomerations?" *Journal of the Geographical Institute "Jovan Cvijić" SASA*, vol. 73, no. 3, pp. 371–378, 2023, doi: 10.2298/IJGI2303371C.
- [29] K. K. F. So, H. Kim, Y. He, and X. Li, "Mapping service innovation research in hospitality and tourism: An integrative bibliometric analysis and research agenda," *Cornell Hospitality Quarterly*, vol. 64, no. 2, pp. 143–160, 2022, doi: 10.1177/19389655221102392.
- [30] J. Bulchand-Gidumal, E. W. Secin, P. O'Connor, and D. Buhalis, "Artificial intelligence's impact on hospitality and tourism marketing: Exploring key themes and addressing challenges," *Current Issues in Tourism*, vol. 27, no. 14, pp. 2345–2362, 2023, doi: 10.1080/13683500.2023.2229480.
- [31] O. H. Chi, G. Denton, and D. Gursoy, "Artificially intelligent device use in service delivery: A systematic review, synthesis, and research agenda," *Journal of Hospitality Marketing & Management*, vol. 29, no. 7, pp. 757–786, 2020, doi: 10.1080/19368623.2020.1721394.
- [32] R. Nagy, F. Horvát, and S. Fischer, "Innovative approaches in railway management: Leveraging big data and artificial intelligence for predictive maintenance of track geometry," *Tehnički Vjesnik – Technical Gazette*, vol. 31, no. 4, pp. 1245–1259, 2024, doi: 10.17559/TV-20240420001479.
- [33] M. Andronie, "Airline applications of business intelligence systems," *INCAS Bulletin*, vol. 7, no. 3, pp. 153–160, 2015, doi: 10.13111/2066-8201.2015.7.3.14.
- [34] G. Casado Salguero, M. Gámez, I. Aldeanueva Fernández, and D. Ruiz Palomo, "Competitive intelligence and sustainable competitive advantage in the hotel industry," *Sustainability*, vol. 11, no. 6, p. 1597, 2019, doi: 10.3390/su11061597.
- [35] Y. Hu and H. Min, "The dark side of artificial intelligence in service: The 'watching-eye' effect and privacy concerns," *International Journal of Hospitality Management*, vol. 110, 2023, doi: 10.1016/j.ijhm.2023.103437.
- [36] H. Patil, V. Mahandule, J. Fakir, and O. Ajgaonkar, "Balancing data privacy and ethics in the age of big data: Challenges and solutions," *Journal of Innovations in Business and Industry*, vol. 3, no. 1, pp. 1–6, 2025, doi: 10.61552/JIBI.2025.01.001.
- [37] L. N. Cain, J. H. Thomas, and M. Alonso Jr., "From sci-fi to sci-fact: The state of robotics and AI in the hospitality industry," *Journal of Hospitality and Tourism Technology*, vol. 10, no. 4, pp. 624–650, 2019, doi: 10.1108/JHTT-07-2018-0066.
- [38] A. Trota, M. Ziosi, and V. Lomonaco, "The future of ethics in AI: Challenges and opportunities," *AI & Society*, vol. 38, pp. 439–441, 2023, doi: 10.1007/s00146-023-01644-x.
- [39] C. H. Li and Y. T. Chow, "A multi-group analysis of car-hailing and taxi on loyalty intention in Hong Kong," *International Journal of Industrial Engineering and Management*, vol. 15, no. 3, pp. 196–212, 2024, doi: 10.24867/IJIEEM-2024-3-357.
- [40] R. Hastuti and S. Syafruddin, "Ethical considerations in the age of artificial intelligence: Balancing innovation and social values," *West Science Social and Humanities Studies*, vol. 1, no. 02, pp. 76–87, 2023, doi: 10.58812/wsshs.v1i02.191.
- [41] P. Pourhejazy, K.-C. Ying, and C.-Y. Cheng, "An algorithmic review of the technological progress and milestones in resource-constrained project planning," *Advances in Production Engineering and Management*, vol. 19, no. 4, pp. 489–511, 2024, doi: 10.14743/apem2024.4.520.

- [42] M. A. Köseoglu, F. Mehraliyev, M. Altin, and F. Okumus, "Competitor intelligence and analysis (CIA) model and online reviews: Integrating big data text mining with network analysis for strategic analysis," *Tourism Review*, vol. 76, no. 3, pp. 529–552, 2021, doi: 10.1108/TR-10-2019-0406.
- [43] K. A. Bollen, *Structural Equations with Latent Variables*. New York: John Wiley & Sons, Inc., 1989, doi: 10.1002/9781118619179.
- [44] J. Henseler, C. M. Ringle, and M. Sarstedt, "A new criterion for assessing discriminant validity in variance-based structural equation modeling," *Journal of the Academy of Marketing Science*, vol. 43, no. 1, pp. 115–135, 2015, doi: 10.1007/s11747-014-0403-8.
- [45] L. T. Hu and P. M. Bentler, "Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives," *Structural Equation Modeling*, vol. 6, pp. 1–55, 1999, doi: 10.1080/10705519909540118.
- [46] R. B. Kline, *Principles and Practice of Structural Equation Modeling*. New York: Guilford Press, 2015.
- [47] T. Raykov and G. Marcoulides, *A First Course in Structural Equation Modeling*. Mahwah: Lawrence Erlbaum Associates, 2006, doi: 10.4324/9780203930687.
- [48] N. J. Morris, R. C. Elston, and C. M. Stein, "A framework for structural equation models in general pedigrees," *Human Heredity*, vol. 70, pp. 278–286, 2011, doi: 10.1159/000322885.
- [49] R. P. McDonald and M. H. Ho, "Principles and practice in reporting structural equation analyses," *Psychological Methods*, vol. 7, pp. 64–82, 2002, doi: 10.1037/1082-989X.7.1.64.
- [50] P. A. Christou, "Artificial intelligence overdependence in tourism," *Current Issues in Tourism*, pp. 1–4, 2024, doi: 10.1080/136883500.2024.2369192.
- [51] R. Law, K. J. Lin, H. Ye, and D. K. C. Fong, "Artificial intelligence research in hospitality: A state-of-the-art review and future directions," *International Journal of Contemporary Hospitality Management*, vol. 36, no. 6, pp. 2049–2068, 2023, doi: 10.1108/IJCHM-02-2023-0189.
- [52] F. Jabeen, S. Al Zaidi, and M. H. Al Dhaheri, "Automation and artificial intelligence in hospitality and tourism," *Tourism Review*, vol. 77, no. 4, pp. 1043–1061, 2022, doi: 10.1108/TR-09-2019-0360.
- [53] T. Gajić, A. Ivanišević, S. Knežević, and M. Bolesnikov, "Exploring the utility of business intelligence and artificial intelligence implementation," in *Proceedings of the Future Business Management and Economics Engineering Conference (FUTURE-BME 2024)*, Novi Sad, Serbia, Dec. 2024, pp. 327–342, doi: 10.24867/FUTURE-BME-2024-037.