

Artificial intelligence in hospitality and tourism

Welcome to *The International Journal of Contemporary Hospitality Management's* special issue on artificial intelligence in hospitality and tourism. I would like to specially thank our guest editors, Carlos Flavián, Dan Wang and Luis V. Casalo, for putting together this very strong and timely special issue. The articles included in this special issue should be well received by scholars, students and practicing managers in our field.

Introduction

Artificial intelligence (AI) is motivating the automation of processes and services, being recently used as a way to interact directly with customers in frontline services (Belanche *et al.*, 2020a). AI constitutes a major source of innovation (Huang and Rust, 2018), with a potential for disruption particularly high in services (Bock *et al.*, 2020). As a result, there is an increasing interest in implementing automated forms of interaction in services (Paluch *et al.*, 2020; Flavián *et al.*, 2021), and this trend is not different in the tourism, leisure and hospitality industry. The use of AI and autonomous robots to perform different tasks in this context is continuously increasing (Ivanov and Webster, 2019; Tussyadiah, 2020; Belanche *et al.*, 2020b), which is reshaping the service and affecting experiences and relationships with customers. In addition, service automation may have a great impact on customer choices (Van Doorn *et al.*, 2017) and behaviors (Grewal *et al.*, 2017).

AI offers the possibility to exploit a wide range of new possibilities (the use of conversational systems such as chatbots and digital assistants; autonomous robots, drones and vehicles; machine learning, blockchain, etc.) and represents a clear opportunity to advance in the transformation of the tourism, leisure and hospitality industry by providing customers with greater value and increasing firms' revenues. For example, AI can be used for strategic decisions such as segmentation, targeting and positioning (Huang and Rust, 2021). As well, according to these authors, different AI levels may be used for standardization, personalization and relationalization purposes. However, in spite of the value that AI can provide to consumers, they can also experience some costs in their interactions with AI (Puntoni *et al.*, 2021).

As a result, this is an increasingly discussed and debated body of literature, even though there is still a lack of empirical research focused on this area (Belanche *et al.*, 2020a; Flavián and Casalo, 2021), and the potential applications to the tourism, leisure and hospitality industry remain unexplored. Therefore, the aim of this special issue is to deepen and broaden the current understanding of the use of AI in the management of hospitality and tourism businesses and its application in different activities.

The articles in this special issue

Broadly, this special issue, which contains 13 papers, offers unique perspectives around three themes: acceptance of AI in hospitality and tourism services, AI job replacement and specific applications of AI in hospitality and tourism (i.e. to improve hotel management and experience, to deal with the COVID-19 pandemic or the development of start-ups based on AI initiatives). Focusing on different tasks and hospitality contexts, the studies provide insights into specific AI-based technologies such as chatbots, service robots or voice assistants.



Acceptance of artificial intelligence in hospitality and tourism services. Six manuscripts are included in this theme. First, Loureiro *et al.* (2021), in the paper “Stand by me: analyzing the tourist–intelligent voice assistant relationship quality,” explore perceived value and attachment to intelligent voice assistants as antecedents of relationship quality in the hospitality domain. Using partial least squares structural equation modeling in two studies, authors find that perceived value is the main determinant of the quality of the relationship between tourists and voice assistants, as well as confirm the moderating role of self-esteem and technology expertise. These results serve to better comprehend the relationship building between tourists and voice assistants and suggest some strategies to successfully implement these services in the hospitality industry.

Second, in the study “‘Find a flight for me Oscar!’ Motivational Customer Experiences with Chatbots,” Jiménez-Barreto *et al.* (2021) develop a framework to understand motivational customer experiences with chatbots. Specifically, the authors analyze both qualitatively and quantitatively the influence of three elements of self-determined interaction with the chatbot (competence, autonomy and relatedness) and five elements of the customer–chatbot experience (sensory, intellectual, affective, behavioral and social) on attitude toward and satisfaction with the chatbot. Findings confirm the direct influence of self-determined interaction on customer experience, the direct effects of these two constructs on attitudes toward and satisfaction with the chatbot and the mediating roles of customer experience and attitude toward the chatbot. Therefore, this paper offers managers a more in-depth understanding of how to get successful customers–chatbots interactions in the hospitality industry.

Third, Zhang *et al.* (2021), in their paper “Impact of anthropomorphic features of artificially intelligent service robots on consumer acceptance: Moderating role of sense of humor,” investigate the impact of both physical and personality-related anthropomorphic features of an AI service robot on consumer cognitive and affective appraisals and their willingness to accept them. Specifically, the authors show the different effects of human-like appearance, mascot-like appearance and machine-like appearance, as well as the moderating role of sense of humor. As a result, this study contributes to previous literature by comparing traditional and mascot-like appearances of service robots and identifies sense of humor as a key anthropomorphized personality trait of service robots. This research thus provides relevant managerial implications for designers of service robots related to anthropomorphic appearance and personality traits in the hospitality context.

Fourth, Tuomi *et al.* (2021), in their manuscript “Spicing Up Hospitality Service Encounters: The Case of PepperTM,” use a multi-method qualitative approach to evaluate two service prototypes with hospitality and tourism experts and frontline hospitality employees. Specifically, the service robot PepperTM is evaluated in two tasks: to provide information and to facilitate order-taking. The authors find that the adoption of these humanoid service robots in hospitality is influenced by four set of factors (contextual, social, interactional and psychological) as well as by extrinsic and intrinsic drivers of adoption, which serve to confirm and extend previous conceptualizations of human–robot interaction in hospitality services. These results offer not only implications for service robots design but also important social and psychological implications.

Fifth, the manuscript “Willingness-to-pay for robot-delivered tourism and hospitality services – an exploratory study,” written by Ivanov and Webster (2021), focuses on consumers’ willingness to pay for robot-delivered services in travel, tourism and hospitality services and investigate the determinants of their willingness to pay. Data from an online survey, which yielded a sample of 1,573 respondents from 99 countries, serve to identify two clusters of customers: those willing to pay nearly the same price for robotic services and

those that expect deep discounts for robotic services. In addition, some demographic characteristics (sex, age, education and income) as well as attitude, expectations or travel frequency are found to be key determinants of willingness to pay. Therefore, results suggest interesting implications for the tourism and hospitality industry, helping to identify those customers more interested in service robots and suggesting some directions in which companies need to work to successfully implement service robots.

Finally, the study “Customers’ Evaluation of mechanical Artificial Intelligence in Hospitality Services: A Study using Online Reviews Analytics,” by [Mariani and Borghi \(2021\)](#), analyzes if the presence of mechanical AI-related text in online reviews influences customers’ online review valence across 19 leading international hotels that have integrated mechanical AI. In this way, authors evaluate to what extent mechanical AI influences customers’ evaluation of AI-enabled hotel service interactions. Almost 50,000 online reviews hosted in Tripadvisor suggest that hotel guests that explicitly mention their interactions with the service robots are more likely to associate high online ratings to their online reviews. In addition, the presence of the robot’s name in the online review reinforces the positive effect of mechanical AI-related text on online reviews ratings. These results offer important implications for hotel managers aiming to introduce service robots into their operations.

Artificial intelligence job replacement

Two manuscripts are included in this theme. On the one hand, the article “A Comparison Between Chatbot and Human Service: Customer Perception and Reuse Intention,” written by [Lei et al. \(2021\)](#), performs a comparison between chatbot users’ communication experience with conversational agents and instant messaging users’ communication experience with human conversational agents. This way, authors aim to identify any difference in users’ perceptions between the two options, as well as the main determinants of intention to reuse the service. Partial least squares structural equation modeling helps confirm that media richness, and social presence positively influence task attraction and social attraction, which in turn affect trust and, subsequently, reuse intention. In addition, differences between instant messaging users (higher scores in terms of communication experience, perceived attractiveness of the conversational agent and trust) and chatbot users (trust in conversational agents is mainly determined by perceived task attraction) are identified. Based on these results, the authors suggest that consumers in general still prefer to interact with human conversational agents. Therefore, rather than replacing, combining chatbot and human resources may be a better option.

On the other hand, the study of [Byrd et al. \(2021\)](#) in their paper “Robot vs. Human: Expectations, Performance, and Gaps in Off-Premise Restaurant Service Modes” takes the increasing use of robots to transport food out of the restaurant as a starting point. In this research, the authors use a mixed-methods approach combining observation with surveys. The purpose is to evaluate the performance of three methods used by restaurants to deliver their services outside the restaurant’s own facilities (delivery by robots, delivery by people or carry-out). Results show that the different methods used to provide this service condition users’ expectations and perceptions of the service itself. For example, human-delivered services were found to be more convenient, whereas robot-delivered services were perceived as more sustainable.

Specific artificial intelligence applications in hospitality and tourism

This theme includes two articles related to AI applications to improve hotel management and experience, two articles dealing with the role of AI to help the hospitality industry overcome the COVID-19 pandemic and one article focused on tourism AI start-ups.

First, [Battiti et al. \(2021\)](#), in the manuscript “Room Tetris in Room Committing: Why the Role of Minimum-length-of-Stay Requirements Should Be Revisited,” analyze different room committing practices and their influence on the occupancy and profitability of hotels. Specifically, authors find that smart committing algorithms diminish the role of minimum-length-of-stay requirements, so that more demand can be accepted without sacrificing late-arriving long reservations. This way, authors contribute to previous literature by proposing proper solutions that diminish the need for minimum-length-of-stay rules and avoid overbooking and customer relocations, especially in hotels working in high-season and high-occupancy situations. According to the authors, the algorithms can be implemented with the support of software and may require a reconfiguration of some automated connections with online travel agencies.

[Pelet et al. \(2021\)](#), in the article “The internet of things in upscale hotels: its impact on guests’ sensory experiences and behavior,” also focus on the application of new technologies in hotels by investigating how the use of Internet of Things may stimulate guests’ senses in upscale hotels and their effects on guests’ emotions, affective experiences, eudaimonism and behavior. The combination of interviews with hotel managers and an online confirmatory survey among hotel guests suggest that guests’ emotions, affective experiences, eudaimonism and behavior are impacted by different senses. Gender exerts a moderating role, being the effect of the sense of smell on both eudaimonism and behavioral intentions, greater for women compared to men. This manuscript thus contributes to sensory marketing literature and suggests that Internet of Things can be applied to create customized multi-sensory hotel experiences.

Turning to the use of AI to address the pandemic, the study “Service robots and COVID-19: exploring perceptions of prevention efficacy at hotels in generation Z,” developed by [Romero and Lado \(2021\)](#), focuses on whether service robots may serve to reduce contagion risk at hotels. Specifically, the authors analyze guests’ perceptions about the use of service robots to prevent COVID-19 and their impact on booking intentions. Focusing on Generation Z individuals, partial least squares structural equation modeling confirms that robot anthropomorphism increases perceived COVID-19 prevention efficacy, which subsequently provokes better attitudes and higher booking intentions. In sum, the use of human-like robots as a COVID-19 prevention measure by hospitality managers may serve to enhance demand.

Similarly, [Gaur et al. \(2021\)](#), in their paper “Role of artificial intelligence and robotics to foster the touchless travel during a pandemic: A review and research agenda,” propose a research agenda with three dimensions (AI and robotics, cleanliness and sanitation and health care and wellness) to advance knowledge regarding the challenges caused by the COVID-19 pandemic. Specifically, the authors propose that AI and robotics may bring out research directions to help the hospitality industry retrieve the COVID-19 crisis, connecting the health crisis and hospitality management. The manuscript thus helps understand the guest’s transformed behavior during the current crisis and may explain customers’ intention to adopt AI and robotics as a protective measure in reaction to COVID-19.

Finally, [Fileri et al. \(2021\)](#), in their article “Artificial Intelligence (AI) for Tourism: A European-based study on successful AI tourism start-ups,” focus on how travel and tourism industry could benefit from the application of AI, trying to gain knowledge about how AI is reshaping this sector. Specifically, authors develop and analyze a database of European AI start-ups operating in the travel and tourism industry and founded between 2005 and 2020. Among others, findings show that: European tourism AI start-ups are mainly created by male STEM graduates between 2015 and 2017 and are concentrated in the capital town of major destinations (France, UK and Spain), and venture capitalists mainly fund AI

technological domains such as learning, communication and services (i.e. chatbot, big data, intelligent systems and digital platforms). These results suggest that there is a high demand for AI solutions that allow marketing automation, segmentation and customization, so that AI solutions should focus more on the pre-trip and post-trip stages.

Conclusion

The articles included in this special issue offer important insights to hospitality and tourism managers by identifying some of the key drivers of customer acceptance of AI services in this context, whether customers are ready to interact with AI instead of human employees or not and how AI may help in specific situations to improve hotel management and experience, address the current COVID-19 pandemic or develop tourism start-ups. The guest editors of this special issue hope that these manuscripts have taken a step toward recognizing the potential of AI services in hospitality and tourism, will inspire and motivate future studies and will encourage more researchers to join this exciting and emerging research area. The future evolution of the tourism and hospitality sector will depend, among others, on the appropriate implementation of initiatives based on AI and other 4.0 technologies. The opportunities offered by these technologies should be considered not only from the business perspective but also from the end user point of view, as they must be willing to use these innovations to guarantee a successful implementation.

Last, but not least, we would like to thank many recognized professionals for their efforts on this issue. First, we would like to thank Professor Fevzi Okumus, Editor-in-Chief of *The International Journal of Contemporary Hospitality Management*, for the opportunity to host this special issue in the journal, which today constitutes an international reference point in specialized research in hospitality and tourism. Second, we would like to thank all the researchers who participated in AIRSI2020. This conference, which was initially going to be held at the University of Zaragoza (Spain), was finally held virtually as a consequence of the pandemic generated by COVID-19 and was the precursor of this special issue. At the conference, authors had the opportunity to interact directly with renowned keynote speakers such as Russell Belk (York University, Canada), Ko de Ruyter (King's College, UK), Debbie Killing (University of Sussex, UK) and Dan Wang (The Hong Kong Polytechnic University, Hong Kong, China), as well as with other specialized researchers, helping to improve the revised versions of their interesting conference papers. Thirdly, we would like to thank all the authors who responded to the call for papers and, particularly, to the authors of the articles included in the special issue. Finally, we would like to thank the anonymous reviewers for providing constructive as well as timely feedback during the review process, which was highly appreciated by the authors and the special issue guest editors.

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References

- Battiti, R., Brunato, M. and Battiti, F. (2021), "RoomTetris in room committing: why the role of minimum-length-of-stay requirements should be revisited", *International Journal of Contemporary Hospitality Management*, doi: [10.1108/IJCHM-11-2020-1364](https://doi.org/10.1108/IJCHM-11-2020-1364).

- Belanche, D., Casaló, L.V., Flavián, C. and Schepers, J. (2020a), "Service robot implementation: a theoretical framework and research agenda", *The Service Industries Journal*, Vol. 40 Nos 3/4, pp. 203-225.
- Belanche, D., Casaló, L.V., Flavián, C. and Schepers, J. (2020b), "Robots or frontline employees? Exploring customers' attributions of responsibility and stability after service failure or success", *Journal of Service Management*, Vol. 31 No. 2, pp. 267-289.
- Bock, D.E., Wolter, J.S. and Ferrell, O.C. (2020), "Artificial intelligence: disrupting what we know about services", *Journal of Services Marketing*, Vol. 34 No. 3, pp. 317-334.
- Byrd, K., Fan, A., Her, E., Liu, Y., Almanza, B. and Leitch, S. (2021), "Robot vs human: expectations, performances and gaps in off-premise restaurant service modes", *International Journal of Contemporary Hospitality Management*, doi: [10.1108/IJCHM-07-2020-0721](https://doi.org/10.1108/IJCHM-07-2020-0721).
- Filieri, R., D'Amico, E., Destefanis, A., Paolucci, E. and Raguseo, E. (2021), "Artificial intelligence (AI) for tourism: a european-based study on successful AI tourism start-ups", *International Journal of Contemporary Hospitality Management*, doi: [10.1108/IJCHM-02-2021-0220](https://doi.org/10.1108/IJCHM-02-2021-0220).
- Flavián, C. and Casaló, L.V. (2021), "Artificial intelligence in services: current trends, benefits and challenges", *The Service Industries Journal*, doi: [10.1080/02642069.2021.1989177](https://doi.org/10.1080/02642069.2021.1989177).
- Flavián, C., Pérez-Rueda, A., Belanche, D. and Casaló, L.V. (2021), "Intention to use analytical artificial intelligence (AI) in services – the effect of technology readiness and awareness", *Journal of Service Management*, doi: [10.1108/JOSM-10-2020-0378](https://doi.org/10.1108/JOSM-10-2020-0378).
- Gaur, L., Afaq, A., Singh, G. and Dwivedi, Y.K. (2021), "Role of artificial intelligence and robotics to foster the touchless travel during a pandemic: a review and research agenda", *International Journal of Contemporary Hospitality Management*, doi: [10.1108/IJCHM-11-2020-1246](https://doi.org/10.1108/IJCHM-11-2020-1246).
- Grewal, D., Roggeveen, A.L. and Nordfält, J. (2017), "The future of retailing", *Journal of Retailing*, Vol. 93 No. 1, pp. 1-6.
- Huang, M.H. and Rust, R.T. (2018), "Artificial intelligence in service", *Journal of Service Research*, Vol. 21 No. 2, pp. 155-172.
- Huang, M.H. and Rust, R.T. (2021), "A strategic framework for artificial intelligence in marketing", *Journal of the Academy of Marketing Science*, Vol. 49 No. 1, pp. 30-50.
- Ivanov, S. and Webster, C. (2019), "Conceptual framework of the use of robots, artificial intelligence and service automation in travel, tourism, and hospitality companies", in Ivanov, S. and Webster, C. (Eds), *Robots, Artificial Intelligence, and Service Automation in Travel, Tourism and Hospitality*, Emerald Publishing, Bingley, pp. 7-37.
- Ivanov, S. and Webster, C. (2021), "Willingness-to-pay for robot-delivered tourism and hospitality services – an exploratory study", *International Journal of Contemporary Hospitality Management*, doi: [10.1108/IJCHM-09-2020-1078](https://doi.org/10.1108/IJCHM-09-2020-1078).
- Jiménez-Barreto, J., Rubio, N. and Molinillo, S. (2021), "'Find a flight for me, Oscar!' Motivational customer experiences with chatbots", *International Journal of Contemporary Hospitality Management*, doi: doi.org/10.1108/IJCHM-10-2020-1244.
- Lei, S.I., Shen, H. and Ye, S. (2021), "A comparison between chatbot and human service: customer perception and reuse intention", *International Journal of Contemporary Hospitality Management*, doi: [10.1108/IJCHM-12-2020-1399](https://doi.org/10.1108/IJCHM-12-2020-1399).
- Loureiro, S.M.C., Japutra, A., Molinillo, S. and Bilro, R.G. (2021), "Stand by me: analyzing the tourist-intelligent voice assistant relationship quality", *International Journal of Contemporary Hospitality Management*, doi: [10.1108/IJCHM-09-2020-1032](https://doi.org/10.1108/IJCHM-09-2020-1032).
- Mariani, M. and Borghi, M. (2021), "Customers' evaluation of mechanical artificial intelligence in hospitality services: a study using online reviews analytics", *International Journal of Contemporary Hospitality Management*, doi: [10.1108/IJCHM-06-2020-0622](https://doi.org/10.1108/IJCHM-06-2020-0622).
- Paluch, S., Wirtz, J. and Kunz, W.H. (2020), "Service robots and the future of service", in Bruhn, M., Kirchgeorg, M. and Burmann, C. (Eds), *Marketing Weiterdenken – Zukunftspfade Für Eine*

- Pelet, J.-É., Lick, E. and Taieb, B. (2021), "The internet of things in upscale hotels: its impact on guests' sensory experiences and behavior", *International Journal of Contemporary Hospitality Management*, doi: [10.1108/IJCHM-02-2021-0226](https://doi.org/10.1108/IJCHM-02-2021-0226).
- Puntoni, S., Reczek, R.W., Giesler, M. and Botti, S. (2021), "Consumers and artificial intelligence: an experiential perspective", *Journal of Marketing*, Vol. 85 No. 1, pp. 131-151.
- Romero, J. and Lado, N. (2021), "Service robots and COVID-19: exploring perceptions of prevention efficacy at hotels in generation Z", *International Journal of Contemporary Hospitality Management*, doi: [10.1108/IJCHM-10-2020-1214](https://doi.org/10.1108/IJCHM-10-2020-1214).
- Tuomi, A., Tussyadiah, I.P. and Hanna, P. (2021), "Spicing up hospitality service encounters: the case of pepperTM", *International Journal of Contemporary Hospitality Management*, doi: [10.1108/IJCHM-07-2020-0739](https://doi.org/10.1108/IJCHM-07-2020-0739).
- Tussyadiah, I. (2020), "A review of research into automation in tourism: launching the annals of tourism research curated collection on artificial intelligence and robotics in tourism", *Annals of Tourism Research*, Vol. 81, p. 102883, doi: [10.1016/j.annals.2020.102883](https://doi.org/10.1016/j.annals.2020.102883).
- Van Doorn, J., Mende, M., Noble, S.M., Hulland, J., Ostrom, A.L., Grewal, D. and Petersen, J.A. (2017), "Domo arigato Mr Roboto: emergence of automated social presence in organizational frontlines and customers' service experiences", *Journal of Service Research*, Vol. 20 No. 1, pp. 43-58.
- Zhang, M., Gursoy, D., Zhu, Z. and Shi, S. (2021), "Impact of anthropomorphic features of artificially intelligent service robots on consumer acceptance: moderating role of sense of humor", *International Journal of Contemporary Hospitality Management*, doi: [10.1108/IJCHM-11-2020-1256](https://doi.org/10.1108/IJCHM-11-2020-1256).