
Guest editorial: Marketing via smart technologies in hospitality and tourism

Introduction

Smart technologies are revolutionizing services across various sectors. Smartness creates an innovative substratum of technological advances that offer new ways for service optimization via capitalizing on intelligence capabilities to best serve consumer needs (Stylos *et al.*, 2021). Consequently, the design, operations management, organization of resources, marketing and communications and actual provision of services have a lot to benefit from adopting and disseminating smart technologies in the service organizations and across service partners, to ultimately influence wider service ecosystems (Priporas *et al.*, 2017). In this vein, value creation as influenced by sophisticated apps and other smart technologies is an area of interest for both marketing scholars and practitioners and requires further investigation to support marketing effectiveness in the Industry 4.0 era (Ekren *et al.*, 2023; Osadchaya *et al.*, 2024).

Notwithstanding the opportunities that have emerged from this new technological environment, various challenges also need to be addressed. These challenges span across service ecosystems and influence the roles and actions of all stakeholders involved. Thus, there are organizational challenges, ethical considerations, environmental concerns and technological challenges that may need to be tackled, mitigated or even avoided (Marder *et al.*, 2024).

Following this line of thinking, researchers and practitioners working in the interdisciplinary field of tourism, hospitality and marketing are particularly interested in not only gaining a better understanding of the “smart” advancements and the implications for this service industry, but also in shaping a balanced approach between the human factor and the technological agents (Christou *et al.*, 2023). Smart apps can support organizations achieve an advanced level of intelligence-enabled tourism and hospitality services, thus possibly leading to real-time data management irrespective of the location (Merican *et al.*, 2021). In this respect, smart technologies create new dynamics regarding stakeholders’ interactions in a tourism context (Jiang and Wen, 2020; Stylos *et al.*, 2021). In other words, various operations, interactions and communications between hospitality and tourism stakeholders can benefit from capitalizing on smart platforms’ information processing, which contributes to a positive spiral of improving and strengthening joint business and marketing actions (Stylos *et al.*, 2021).

Although marketing with smart apps has started becoming a very popular field of study and practice in the last few years (e.g. McCartney and McCartney, 2020; Tussyadiah, 2020), the impact of smartness on organizations’ operations and performance, tourists’ preferences, residents’ well-being and rest of stakeholders’ decision-making processes is limited (Au and Tsang, 2022; Balaji *et al.*, 2024; Wong *et al.*, 2024). Moreover, investigating and mapping various stakeholders’ interactions, and associated organizational opportunities and challenges emerging from the adoption of smart technologies, can prove crucial for rendering well-informed service blueprints in the tourism and hospitality services, to advance decision-making of all parties involved (Hu *et al.*, 2023; Jiang and Wen, 2020). As there is need to move from general conceptualizations of smartness to empirical research investigations of how tourism and hospitality may improve



through smart technology (Stylos and Vassiliadis, 2023), the behaviors and decision-making processes of customers, organizations and the local community may be investigated in a holistic manner to unravel key insights and generalize important trends (Huang *et al.*, 2022; Jeong and Shin, 2020). Therefore, the investigation of smart interactions among different stakeholders by considering how smart technologies can support different aspects and operations of the service provision can boost the efficiency of tourism and hospitality ecosystems (Buhalis *et al.*, 2023).

The aim of the special issue on “Marketing via Industry 4.0 smart technologies in hospitality and tourism” has been to provide new theoretical approaches and practical cases that offer new ways of marketing via smart technologies in tourism and hospitality. Much importance has been placed on the dynamic capabilities and increased assimilation of smart technologies to study the contemporary transformational business aspects in this service industry (Acikgoz *et al.*, 2024; Stylos and Zwiigelaar, 2019). Seeking to understand the influence of “smart” on tourism and hospitality businesses and individual decision-making processes, the current special issue provides key theoretical and empirical contributions, including models, theoretical and practical approaches, methods and case studies, to upgrade our knowledge into the relevant marketing management phenomena of this exciting Industry 4.0 era for this sector.

Overview of the papers included in the current special issue

The current publication includes 18 papers which provide key insights as well as theoretical and practical implications for scholars and practitioners interested in further advancing their knowledge in the influence of new technologies on tourism and hospitality marketing and tourist behavior.

Nguyen *et al.* (2024) analyze customer emotions, revealing the levels of positive or negative emotions. Their goal was to use machine learning methods to build a model to identify customer emotions. In doing so, a customer emotion detection model and data mining methods have been employed, resulting in the collection of 80,593 online reviews on [agoda.com](https://www.agoda.com) and [booking.com](https://www.booking.com) from 2009 to 2022. The model outcomes, pertaining to the detection and classification of customer emotions based on ratings and reviews into four distinct emotional states, offer a means to address the challenge of determining customer satisfaction regarding their actual service experiences. The findings hold substantial value for businesses operating in this domain, as they enable the evaluation and formulation of improvement strategies within their business models. The proposed models enable the identification of customers' emotions, the discovery of customer demand, the enhancement of service and the overall customer experience. The established models can be used by various service sectors, assisting them in learning more about customer satisfaction through customer reviews related to offered products and services.

Phang and Kong (2024) examine both the technical and sensory factors influencing Malaysians' intention to adopt virtual tours (IA) and their subsequent intention to visit an actual heritage site (IV) in the heritage travel decision-making process. In this vein, they adopted the unified theory of the acceptance and use of technology 2 (UTAUT2) and the theory of substitutability. They gathered a total of 278 valid survey responses via purposive sampling, which were analyzed using SPSS26 and SmartPLS4 software. The findings support the significant positive effect of IA on IV, which supplements evidence to subdue misapprehensions that virtual tours (VTs) are competitors or substitutes for in-person visitations. Perceived substitutability was found to have an indirect impact on IV through IA, further proving the mediating role of IA in influencing IV. Technical and sensory factors, namely performance expectancy, hedonic motivation, habit and perceived substitutability of IA, were shown to be critical in influencing IA. However, effort expectancy, social influence

and facilitating conditions were not influential. This study offers practical implications to the tourism industry and potential visitors, who can utilize VTs to determine whether targeted tourism destinations are worthy of investing their resources. The findings suggest that the virtual tour experience contributes to tourists' IV by successfully piquing their interest to physically visit heritage sites in the future. The virtual tour could be utilized to generate demand in times of temporary replacement or closure. Destination marketing organizations and destination management companies should consider the technical and sensory aspects of VTs, specifically prioritizing the hedonic motivation factor.

Strickland and Williams (2024) examine how wine stakeholders adopted innovative advancements in smart industry 4.0 application technology (SI4.0AT) coupled with electronic word-of-mouth (e-WOM) techniques to increase winery visitation and wine sales, prior to and during a global pandemic. A qualitative interpretivist geographical bounded case study approach was employed to collect data from fifteen Victorian (Australian) wine stakeholders' prior to and during the global COVID-19 pandemic. A thematic analysis was applied to interpret participant responses and how they viewed, reacted to and harnessed SI4.0AT and e-WOM to continue and increase wine sales. The findings suggest that few wine stakeholders were actively implementing SI4.0AT prior to the global COVID-19 pandemic. With the forced closure of wineries to visitors across Australia, most small to medium-sized wineries immediately changed their business models to concentrate on domestic e-commerce wine sales and home delivery. To support these new business models, e-WOM techniques were quickly adopted or increased, while other SI4.0AT technologies were not embraced due to financial restraints.

Raza *et al.* (2024) propose that brand selfies have the capability to help brands thrive through crises. Such selfies spark a self-inferential process that makes customers feel connected to the brand and makes them biased toward a specific brand in uncertain situations. A sample of 166 questionnaires were analyzed through partial-least squares (Smart PLS) and a niche group of young millennials was selected based on their use of luxury items, frequency of visits to leisure spas and hotels, high-end car showrooms, branded jewelry stores and luxury watch shops. The study highlights the emergence of brand selfies during crisis and the priority customers attribute to them when compared with brand-generated content or promotional campaigns. The results indicated a positive influence of brand selfies on brand preferences directly and through the mediation of brand signature. The research classifies the impacts of brand selfies in Thailand's luxury, leisure and tourism market and their role in enabling brands to thrive through crises. The study is among the few that position brand selfies as a hassle-free promotional tool for brand signature and a game-changing strategy to deal with crises.

Gani *et al.* (2024) show how smart tourism technologies increase tourists' psychological well-being by capitalizing on the theory of Tourism 4.0. The study investigates the associations between STT factors and perceived benefit, as well as between perceived benefit and the psychological well-being of tourists. Findings show that automation, security/privacy concerns, information accuracy and personalization are significantly related to the PB of tourists. The proposed notion of tourism 4.0 is a new paradigm that seeks to unlock the psychological well-being of visitors through the hyper-interconnectedness of humans and technologies.

Putra and Law (2024) examine the critical success factors of a virtual hotel operator in establishing hotel management system partnerships with small- and medium-sized hotels. Adopting a qualitative approach, 25 semi-structured interviews were conducted with hotel owners and virtual hotel operator management. Thematic analysis was used to determine themes to evaluate hotel owners and operators' perceptions. Critical success factors for partnerships with virtual hotel operators in the assumed hotel size category include marketing and promotion strategies, client relationships, training and human resources development, hotel operations management, innovation strategies, capital expenditures and property management systems. Virtual hotel operators also symbolically contribute to mutualistic relationships with small- and medium-sized hotels by enhancing service, product

competitiveness and profitability. The paper adds to the literature on critical success factors in the context of digital technology implementation with the ultimate goal of measuring the business performance of the companies and increasing resilience in the accommodation sector.

[Sujood *et al.* \(2024\)](#) examine the primary factors that influence consumers' intention to use smart technologies in the tourism and hospitality industry by integrating the technology acceptance model (TAM), theory of planned behavior (TPB) and trust in the context of Smart 4.0 technologies. A convenience sampling approach was employed in this study. Data were collected online using a survey instrument by posting the questionnaire link on the social network web pages of travel agencies. The findings show that conjoining TAM and TPB with trust results in a robust model for predicting customers' intention to use smart technologies in the tourism and hospitality industry.

[Le *et al.* \(2024\)](#) use the voice of the customer strategic approach to collect user-generated content and compare customer expectations with reality, to make the necessary improvements for the business and create personalized strategies for each customer to ultimately maximize the revenue of hospitality business units. Methodologically, a combination of three models took place: the net promoter score (NPS), graph model and latent Dirichlet allocation (LDA). These models were based on natural language processing (NLP) to explore the multidimensional aspects of the customer's voice. A dashboard system was implemented to visualize the analysis results and provide recommendations on marketing strategies to improve product and service quality by accurately and effectively listening to customers.

[Khan and Mehmood \(2024\)](#) use a conceptual model based on innovation resistance theory to investigate fast-food employees' use of service robots. To do so, an explorative research approach was followed and data from 247 valid respondents were analyzed via Smart-PLS. The findings demonstrated that drivers of robot adaptation significantly influenced image barriers, risk barriers, traditional barriers, usage barriers and value barriers. The results also revealed that usage, image and traditional barriers significantly affect usage intention. These insights contribute to successful business reopening strategies following the COVID-19 crisis.

[Çolakoğlu *et al.* \(2024\)](#) explore tourists' virtual reality experiences during the transition toward the Metaverse. A qualitative approach was employed to capture tourists' virtual reality experiences and their knowledge of the Metaverse at two five-star hotels based in Turkey. The research design focused on data collection via structured interviews and the collected data were analyzed through content analysis to produce themes. The findings show that most participants have never experienced a virtual reality application. Hotels and travel agencies should be aware of this new futuristic technology before the Metaverse transition. Metaverse may be more attractive to Generations Y and Z rather than Baby Boomers and Generation X. These findings advance the work currently under development in this emerging field and provide insights into customers who may or may not have previous experience with virtual reality applications, and who may or may not be familiar with the concept and digital environment of the Metaverse.

[Yağmur *et al.* \(2024\)](#) focus on revealing hotel managers' perspectives, strategies and predictions regarding smart technologies, along with their expectations for current and future employees. A qualitative research approach was used to reveal managers' viewpoints on smart tourism. With a snowball sampling method, face-to-face interviews were conducted with 16 senior hotel managers working in a 5-star hotel located in Antalya, Turkey. Among the most important findings, rapidity/quickness, managing/holistic assessment, standardization, harmony/integration-coordination and experience-memory emerged as significant themes, thus adding to previous research by [Stylos *et al.* \(2021a, b\)](#). Regarding the use of smart technology, its internalization and openness provide important benefits to hotels, such as increasing revisits and guest satisfaction, thus contributing to increased loyalty and reduced costs to strengthen hotels' competitive strategies.

Moreno Brito *et al.* (2024) apply text mining with big data exploration, semantic network analysis, EFA and linear regressions to analyze customer satisfaction associated with experiences from 14 ecological hotels in Ecuador by exploring online guest reviews and classifying the most influential factors. A total of 22,629 online reviews from Google/travel were analyzed, leading to the extraction of 100 words with the highest frequency. In addition, CONCOR analysis built a comprehensive structural model that gathers essential keywords. CONCOR analysis displayed four categories associated with satisfaction: tangibles, experience, location and empathy. Then, EFA restructured and revealed facility features, assurance, reliability, location and experience as key factors. Lastly, the regression disclosed location, assurance and facility features as the most significant factors for customer satisfaction in the selected ecological hotels. This paper provides empirical evidence by employing big data mining and analysis for hoteliers to understand what guests perceive as green practices and how they perceive them.

Kumar *et al.* (2024) study the evolution of research on digital transformation in the tourism sector and classify the research based on publication, author, journal and country productivity. The research employed VOSviewer software to analyze the structure of publications and citations of 61 articles, incorporating bibliometric variables like co-authorship, co-citation network, keywords co-occurrence network and bibliographic coupling. The study yielded valuable insights from top-cited articles, revealing their contributions to digital transformation in tourism research. Additionally, the study uncovers new areas of digitization in the tourism sector, further enhancing its value and relevance.

Mojoodi *et al.* (2024) focus on determining the ideal fare for various aircraft itineraries by modeling prices using a neural network method, as early demand forecasting on a specific route can assist an airline in strategically planning flights and determining optimal pricing strategies. A feedforward neural network was employed in this study for a dataset consisting of 16,585 records of Iranian airlines' flight data. The findings indicate that the proposed model achieves a high level of accuracy in approximating the actual data and can effectively predict the optimal ticket price for various flight routes with minimal error. The neural network algorithm utilized in this study offers a valuable opportunity for companies to enhance their decision-making processes. By leveraging the neural network algorithm's features, companies can analyze past data effectively and predict future prices, thereby improving effectiveness and timeliness of their decision-making.

Rafdinal *et al.* (2024) investigate the adoption of virtual reality (VR) applications in the hospitality sector by integrating the value-based adoption model (VAM) and VR quality. Data were collected via surveying 500 subjects and were analyzed with PLS-SEM and importance-performance map analysis (IPMA). The findings revealed that VR quality and perceived value are vital antecedents of the adoption of VR applications in the hospitality industry. Hospitality managers, marketers, guests and other stakeholders interested in improving service provision and contributing to the overall development of the hospitality industry, can benefit from this proposed customer-centric VR approach.

Asif and Fazel (2024) explore transformative trends and emerging research patterns at the intersection of digital technology and tourism through a bibliometric analysis of 575 articles from 2022 to 2023. The goal was to provide insights into the evolving landscape, identify key themes, influential authors and prominent journals, thus contributing to a nuanced understanding of this dynamic field. This bibliometric analysis reveals a significant growth in annual scientific production on digital technology and tourism. It also emphasizes the centrality of smart tourism and the interconnectedness of technology, hospitality and management in shaping future research directions.

Fang and Liou (2024) develop an indicator framework for assessing workforce employability at upscale hotels, taking into account the improvement of their competence by utilizing artificial intelligence applications. The Delphi method was employed for data collection, and a hybrid fuzzy approach was applied to quantify the information originated

from expert judgments. The workforce employability at an upscale hotel was assessed from the perspective of hotel executives, taking into account the capability of the workforce to adopt advanced technologies, including familiarity with artificial intelligence. These may possibly help managers avoid labor shortage problems and improve the efficiency of hotel operations, services and management practices.

[Khan \(2024\)](#) determines how the attitudes of religious tourists affect their AI self-efficacy and their engagement in AI. The study also investigates the mediating role of AI self-efficacy, as well as the moderating role of AI assistant use in the relationship between attitudes toward AI and AI self-efficacy. A sample of 282 religious tourists was surveyed via purposive sampling, and the data were analyzed through multiple regression analysis. The findings demonstrate that attitudes toward AI had a significant impact on AI self-efficacy, which in turn exert a positive impact on engagement with AI. Furthermore, the use of AI agents positively moderates the link between attitudes toward AI and AI engagement.

In conclusion, the current special issue on Marketing via Industry 4.0 smart technologies offers a contemporary perspective on how smart technologies transform tourism and hospitality, by creating new dynamics in the tourism business ecosystem. Collectively, the papers in this special issue showcase a great diversity of innovative methods, advance theory, provide practical insights, map research in the field and chart future research opportunities. We envisage that this issue opens new avenues of inquiry for further advancing research in the fast-changing area of marketing innovation and decision-making as influenced by smart technologies. We sincerely hope readers will find this special issue useful for their academic or industrial studies, projects and reports. We would like to thank all authors for their valuable contributions to the field by entrusting us with their original work for publication in this special issue. We additionally want to acknowledge the service provided by the esteemed reviewers, as they have played a key role in advancing the quality of submitted manuscripts through their constructive feedback to the authors. Finally, we wholeheartedly thank Prof. Dr Fevzi Okumus, Editor-in-Chief of the *Journal of Hospitality & Tourism Insights (JHTI)*, for his thoughtful leadership and his invaluable support for the realization of this special issue.

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