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RESEARCH NOTE



AI-powered ChatGPT in the hospitality and tourism industry: benefits, challenges, theoretical framework, propositions and future research directions

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ABSTRACT

Generative artificial intelligence (AI) and smart/e-tourism provide imperative opportunities to service industries; however, the implementation of ChatGPT in the tourism and hospitality industry is limited, which extends different considerations/challenges that need vigilant reflection. Based on this significance and research gap, we thus develop a theoretical framework which suggests different sets of key research propositions in AI technology-powered ChatGPT. A widespread literature review and practices were conducted to investigate the conceptual advancements/developments on generative AI-powered technologies including ChatGPT, chatbot in marketing, tourism, hospitality and information management. The proposed framework suggests generative AI technology-powered ChatGPT develops customer's interaction-based conditions including experience, engagement/trust, attachment, satisfaction/service quality, attitude change and operational efficiency, which consequently affect their strategic outcomes including behaviours, subjective/psychological well-being, happiness and performance. Thus, this research note suggests theoretical/practical implications to provide an extensive future-research roadmap on AI technology-powered ChatGPT and also recommends transformative opportunities, challenges and benefits in tourism, hospitality and marketing management.

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Generative AI technology-powered ChatGPT; customer experience; customer engagement; strategic outcomes; hospitality and tourism; future research roadmap

Introduction

Digital technologies (e.g. artificial intelligence (AI)-based ChatGPT, chatbots, robots or metaverse), machine learning, e-tourism and smart tourism are important for the effectiveness of strategic marketing for grasping consumers' service experience, engagement, satisfaction, behaviour and brand performance in service industries including hospitality and tourism (Buhalis et al., 2019; Bulchand-Gidumal et al., 2023; Dogru et al., 2023; Koo et al., 2023). Various organizations adopt digital technologies to distinguish themselves from rivals to develop their operational efficiency and performance (Dwivedi, Kshetri, et al., 2023; Plangger et al., 2022). These vital strategic imperatives continuously raise the artificial intelligence market size/revenue to over 1.5 trillion USD by 2030 (Statista, 2023). Relatedly, the market size/revenue of ChatGPT is expected to attain about 200 million USD by 2023 and 1 billion USD by 2024 (Bankmycell, 2023). Thus, ChatGPT has generated a fresh wave of worldwide discussion across many scholastic domains including marketing, tourism and hospitality management (Dwivedi, Pandey, et al., 2023). ChatGPT acts as an all-purpose chatbot on the basis of *OpenAI* with the capability to 'generate human-like text' (Wong et al., 2023). ChatGPT also acts as a communicative user interface that is based on

the GPT large-language model, which encourages AI applications to generate images/texts due to *Open AI* (Mich & Garigliano, 2023).

Several firms/brands are finding ways to explore and exploit the potential of ChatGPT in their business (Kim et al., 2023). For example, Microsoft had integrated ChatGPT in its AI-powered *Bing* search engine with increased user experience and excellent results (Forbes, 2023). Top companies, including OpenAI, Meta, Microsoft, Google and Expedia, have adopted it by assessing its integration into consumer-based activities (Gursoy et al., 2023). The adoption of ChatGPT within the tourism and hospitality industry is still in the early stages (Revfine, 2023; Wong et al., 2023). The tourism and hospitality industry is anticipated to rise by 3% during 2022–2027 and tend to achieve about 9 trillion USD by 2027 (THMF, 2023). These investments accentuate the enormous capacity of AI technology-based ChatGPT for various companies, incorporating the tourism and hospitality industry (Carvalho & Ivanov, 2023; Dwivedi, Pandey, et al., 2023).

The hospitality and tourism industry has typically been conservative relating to the use of technology, considering the nature and characteristics of the particular industry (Wu & Cheng, 2018). Tourism and hospitality

Table 1. AI-powered ChatGPT in practice.

User's queries	Responses from AI-powered ChatGPT
What are the popular tourism destinations in London?	'London, being a vibrant and cosmopolitan city, offers an array of popular tourism destinations that cater to a wide range of interests. Here are some of the must-visit attractions in the city: Buckingham Palace, the British Museum, The Tower of London, The Houses of Parliament and Big Ben, The London Eye, The Tate Modern, The National Gallery, Covent Garden, The British Library. These are just a few of the many popular tourism destinations that London has to offer. The city is brimming with history, culture, and entertainment, making it a fascinating destination for travelers of all kinds'
What is the best time to visit London?	'The best time to visit London largely depends on your preferences and what you would like to experience during your trip. Here are some factors to consider: Weather: London has a temperate maritime climate, meaning it rarely experiences extreme temperatures. Summers (June to August) are generally mild and can be pleasant, with average temperatures ranging from 18–25 degrees Celsius. Events and Festivals: London hosts a variety of events and festivals throughout the year that may be of interest to you. For instance, the summer months see major events like Wimbledon (June-July). Ultimately, London offers attractions and activities year-round. Each season has its own charm and advantages, so it's important to consider your personal preferences when deciding on the best time to visit'
What are the top hotel brands in London?	'London is home to a wide range of hotel brands, catering to different preferences and budgets. Here are some of the top hotel brands you can find in London: The Ritz London, The Dorchester Collection, Four Seasons Hotels and Resorts, InterContinental Hotels & Resorts, The Shangri-La Hotel, The Langham, London, Hilton Hotels & Resorts, Marriott Hotels, Radisson Blu Edwardian. Remember, these are just some of the top hotel brands in London, and there are many more options available to suit different preferences, budgets, and locations within the city'

Source: Authors' conversation with AI-powered ChatGPT.

firms/brands (e.g. Expedia) are testing the integration of Chatbots in consumer service support and service delivery (Mich & Garigliano, 2023). AI-powered ChatGPT has direct applications within the tourism and hospitality sector to enhance consumer experience, engagement and employee efficiency (Carvalho & Ivanov, 2023; Wong et al., 2023). AI-powered ChatGPT offers perfect query-based results and might solve most general queries. This interface might offer tourists speedy resolutions to their (in)queries and, thereby, an improved tourist experience, engagement/trust, satisfaction/service quality and consequent behaviours. Table 1 indicates a sample of replies by the ChatGPT for diverse tourism and hospitality-linked inquiries. ChatGPT assists visitors in making informed alternatives about the places to be integrated into their schedule/decisions about popular destination selection, the best time to visit a destination, top hotel brands, routes, pricing, etc.

Investigating the capability of ChatGPT, its benefits and challenges in the identification of suitable service experiences, creating/delivering service experiences and how the uses of ChatGPT impact the future directions of the tourism and hospitality industry could be the important tasks in this perspective. Responding to aforesaid gaps and capability/challenges, ChatGPT may be adopted as a future customer/user evaluation/experience tool (Dwivedi, Pandey, et al., 2023; Gursoy et al., 2023), theoretical frameworks, research propositions and future-research roadmap should be developed to render an integrated ChatGPT ecosystem by knowing the benefits of using ChatGPT in the tourism and hospitality industry (Mich & Garigliano, 2023; Wong et al., 2023).

AI-powered ChatGPT – a new disruptive technology in hospitality/tourism management

The development of AI-powered ChatGPT has unlocked the virtual Pandora's Box of the 'strong AI era' (Wong et al., 2023). This revolution of AI-powered ChatGPT is dependent on self-generated large-language-models (LLM), which is a machine-learning-system that learns independently from data to generate seemingly intelligent and complex writing once training on extensive textual data sets (Mich & Garigliano, 2023) that might tackle various faults of traditional-based artificial intelligence programmes. ChatGPT is set with excellent generative AI and NLP resources to help and is applicable in many scholastic areas, such as scientific research, educational training or medical care (Kim et al., 2023). It has also acquired substantial attention in the tourism/hospitality industry.

AI-powered ChatGPT: potential benefits and challenges/pitfalls

The adoption of AI-powered technologies (e.g. ChatGPT/chatbots), machine learning and e-tourism/smart tourism are expected to impact service-based experience creation and delivery in many important areas: super-personalization, hyper-connectivity and super-intelligence (Carvalho & Ivanov, 2023; Gretzel et al., 2015). The adoption of AI-powered ChatGPT tends to assist service firms/brands to deliver integrated and seamless service experiences during consumers' travel-related journeys from the pre-trip stage to en-route and finally post-trip stage (Wong et al., 2023). ChatGPT

also provides various benefits, including personalization, real-time information/updates, multilingual capability, NLP accessibility, accuracy and integration of additional travel-related services (Dogru et al., 2023; Gursoy et al., 2023). Despite its benefits, the adoption of AI-powered ChatGPT has various pitfalls/challenges, including issues of real-time data management/updates, replacement of human labour, deployment costs, security concerns and emotional programming complexity (Gursoy et al., 2023). Managing and resolving these challenges/constraints is important to ensure the long-standing advancement and adoption of ChatGPT in service-experience creation/delivery processes. To achieve this, the technological-led competencies should be enhanced, data security should be ensured, data should be managed efficiently, consumer experience, satisfaction and engagement should be significantly assessed and policies/practices should include societal implications (Dwivedi, Pandey, et al., 2023; Paul et al., 2023).

Towards the development of novel theoretical framework and research-propositions

In developing our proposed theoretical framework, the present study combines reviews and explores the pioneering, cutting-edge and contemporary research in the domains of generative AI, chatbots, machine learning and robots (Dogru et al., 2023; Jiang et al., 2022; Ozturk et al., 2023; Pizam et al., 2022), ChatGPT (Dwivedi, Kshetri, et al., 2023; Dwivedi, Pandey, et al., 2023; Gursoy et al., 2023; Kim et al., 2023; Wong et al., 2023) digital technologies (e.g. VR/AR/XR, metaverse, blockchain) (Plangger et al., 2022) and e-tourism/smart tourism (Buhalis, 2020; Bulchand-Gidumal et al., 2023; Casais & Ferreira, 2023; Gretzel et al., 2015; Yang & Zhang, 2022) in hospitality, tourism and marketing. For instance, generative AI technologies can produce substantial developments in the tourism/hospitality industries due to the range of creative aspects (Wong et al., 2023). However, researchers have expressed questions regarding the potential of generative AI (Dogru et al., 2023). ChatGPT can enhance consumer engagement/trust, experience, satisfaction or loyalty, modifying travel plans, optimizing the management of tourism/hospitality firms/brands and offering other advantages (Dwivedi, Kshetri, et al., 2023; Dwivedi, Pandey, et al., 2023; Gursoy et al., 2023). This article proposes a theoretical framework that suggests generative AI technology-powered ChatGPT develops visitor's experience, engagement/trust, satisfaction/service quality, attitude change, attachment and operational efficiency, which

consequently affects their behaviours (e.g. loyalty, feedback and recommendations), happiness, subjective/psychological well-being and performance (Figure 1).

Research propositions

Customer experience: a central association between AI-powered ChatGPT and strategic outcomes

Customer experience refers to 'non-deliberate, spontaneous responses and reactions to offering-related stimuli along the customer journey' (Becker & Jaakkola, 2020, p. 637) and it has recently garnered substantial interest in the hospitality, tourism, marketing and information technology literature (Rather, 2020; Yang & Zhang, 2022). Developments of AI, digital technologies, machine learning and smart/e-tourism have significantly received interest in theory and practice (Buhalis et al., 2019; Li & Wang, 2023). The integration of AI (e.g. ChatGPT, human-robot interactions) in consumer service enhancement and experience is one of the most exhilarating yet disruptive practices so far (Pizam et al., 2022; Koo et al., 2023). It is rapidly re-designing brand-based communications and consumer experiences with unparalleled skill and efficiency (Xu et al., 2023) while developing marketing transformations. Human-robot interactions and human-consumer service chatbot interactions increase user's experience with particular firms/brands (Ozturk et al., 2023; Xu et al., 2023). The use of ChatGPT is envisaged to result in significant transformations in the tourism and hospitality industry by disrupting how consumers seek information in making informed decisions, and how firms/brands create, produce and deliver tailored tourism/hospitality-based experiences and services (Gursoy et al., 2023).

AI-based chatbots are becoming ever more prevalent in various services industries (e.g. fashion, retailing, tourism, hospitality) because of their capability to offer tailored shopping experiences and develop their consequent behaviour and well-being (Aslam, 2023; Dwivedi, Kshetri, et al., 2023; Yang & Zhang, 2022). The purpose is to offer captivating and tailored experiences that stimulate consumer loyalty/retention and performance (Aslam, 2023; Mich & Garigliano, 2023). In other words, AI-based chatbot services can improve consumer's favourable responses, including enhanced experiences (Li & Wang, 2023) which, in turn, stimulates their behaviour/well-being (Kasilingam, 2020), happiness or performance (Plangger et al., 2022). Rooted in this advice, we theorize:

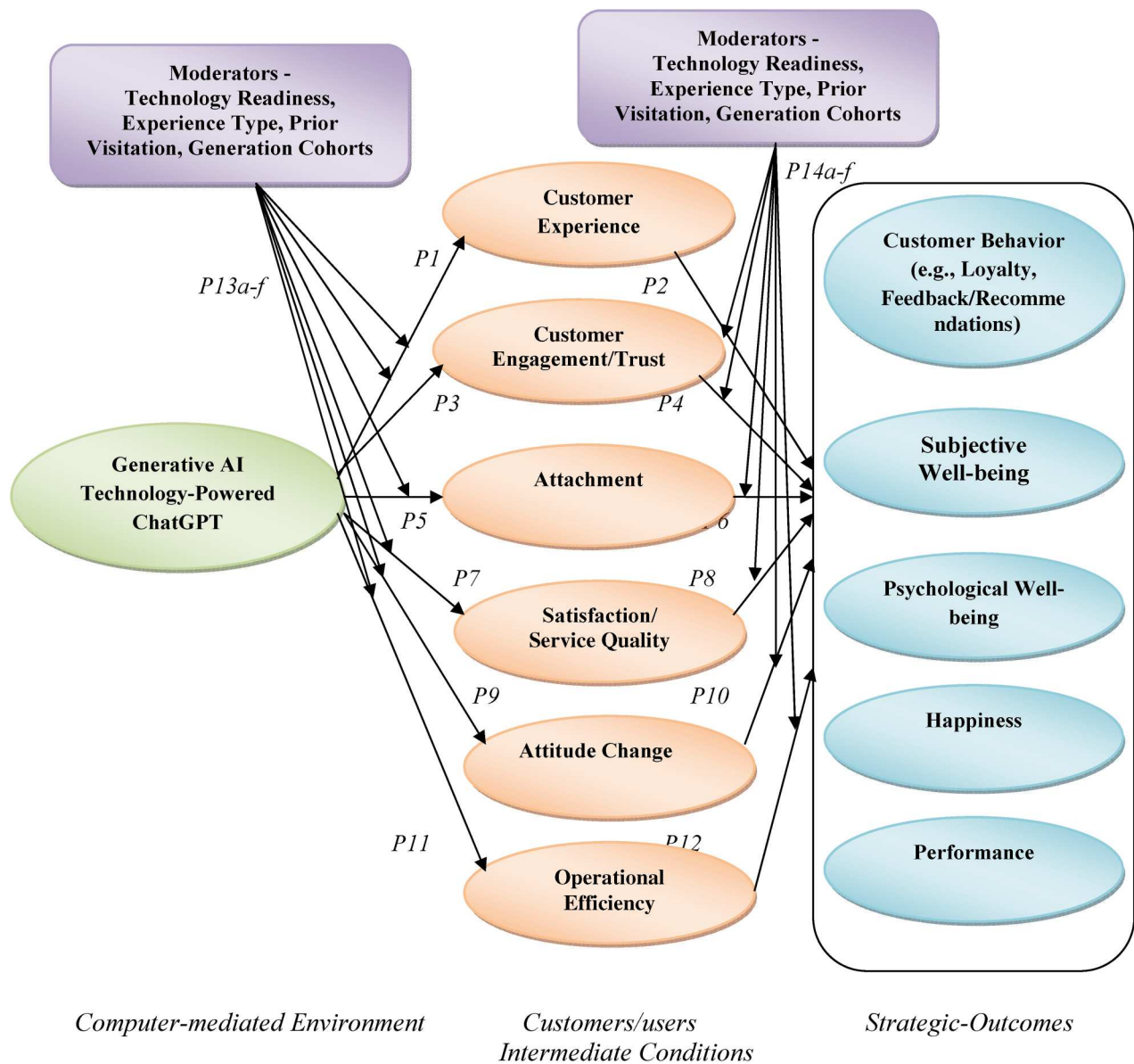


Figure 1. A theoretical framework integrating computer-mediated environments, intermediate conditions and strategic-based outcomes of AI technology-powered ChatGPT in hospitality/tourism marketing.

Proposition-1: Generative AI-powered ChatGPT would develop increased levels of experience.

Proposition-2: The higher the levels of consumers' experience, the higher the positive strategic outcomes.

Customer engagement/trust: a critical relation between AI-powered ChatGPT and strategic outcomes

Due to AI-technological advancements and smart/e-tourism, consumer engagement has gathered significant interest in tourism and marketing research to develop competitive advantage (e.g. Dwivedi, Kshetri, et al., 2023; Peng et al., 2023). Customer engagement takes place due to the interactive consumer experiences

towards a focal object (e.g. AI-based ChatGPT, VR/AR-experience with a tourism/hotel firm) (Flavián et al., 2020; Rather et al., 2021, 2023; Wong et al., 2023). Trust refers to a belief that AI-based technological responses/recommendations are credible and reliable (Baek & Kim, 2023). With reference to consumer engagement/trust, existing theoretical advancements have highlighted the role of AI technologies, VR devices/technologies, metaverse or blockchain to enhance their engagement and trust with tourism/hospitality firms (Dogru et al., 2023; Paul et al., 2023), and have called for exploration in the subject (Wong et al., 2023).

Customer engagement is strengthened with generative AI-based applications wherein tourism/hotel brands/companies might interact in the most

immersive means with users/customers (Rather, 2023; Wong et al., 2023). For example, ChatGPT-based conversational agents and chatbots might offer customers a more interactive/engaging experience compared to traditional types of communication, like phones/emails (Carvalho & Ivanov, 2023; Paul et al., 2023). Relatedly, Gursoy et al. (2023) and Paul et al. (2023) argued that conversational AI's humanness (e.g. listening/speaking) encourages the levels of customer trust. Likewise, AI-powered chatbot motivations (i.e. task efficiency, information seeking, personalization, playfulness and social interaction) have been established to positively impact perceived trust in AI chatbots (Baek & Kim, 2023). Fan et al. (2022) and Jiang et al. (2022) corroborated that digital technologies (e.g. VR/AR) and AI-based technologies (chatbot) induce consumer engagement/trust and generate their subsequent behaviours (e.g. loyalty/recommendations, feedback), happiness or performance (Fan et al., 2022). Anchored in this advice, we suggest:

Proposition-3: Generative AI-powered ChatGPT would develop elevated levels of customer engagement and trust.

Proposition-4: The higher the levels of consumers' engagement and trust, the higher the positive strategic outcomes.

Attachment: an imperative link between AI-powered ChatGPT and strategic outcomes

Attachment is a fundamental human need (e.g. Maslow, 1944) and has a decisive impact on customer's destination choices and decision-making (Wu & Cheng, 2018) and customer behaviour (Pentina et al., 2023). Attachment is defined as the tendency of a customer to stimulate robust emotional bonds with a focal object (Pentina et al., 2023; Rather et al., 2022; Wu & Cheng, 2018). Attachment theory (Bowlby, 1969) has been employed to recognize long-term and deep emotional connections between humans and objects. Human-identity-cue, like being a conversational and responsive dialogue cohort, is important as it increases social presence from chatbot consumers, which is established to stimulate emotional attachment (Jiang et al., 2022; Paul et al., 2023). Supporting this, Pentina et al. (2023) documented that AI social interaction with chatbots develops a positive relationship with attachment. Consumers who are more emotionally attached to AI chatbots tend to increase strategic-based outcomes, such as behaviour, well-being or performance with tourism and hospitality firms/brands (Pentina et al., 2023). Following these ideas, we propose:

Proposition-5: Generative AI-powered ChatGPT would develop increased levels of attachment.

Proposition-6: The higher the levels of consumers' attachment, the higher the positive strategic outcomes.

Satisfaction/service quality: a crucial link between AI-powered ChatGPT and strategic outcomes

Satisfaction refers to an ex-post assessment of a customer's early (trial-) experience with a service and is encapsulated as positive- or (negative) feelings (Jiang et al., 2022). Service quality refers to customers' perception and overall subjective assessment of service in an interactive process of service delivery (Parasuraman et al., 1988). Satisfaction acts as a key self-regulating emotional-based response (e.g. Bagozzi, 1991), and it might induce willingness-to-use services (Fan et al., 2022). AI and natural-language-processing (NLP) chatbots have enhanced the influence of customer marketing and the efficiency of consumer service (Paul et al., 2023). Customers articulate satisfaction with AI-based digital assistants (Pizzi et al., 2021). Researchers established that competent, accurate, credible and customized communication through chatbot services/human agents might diminish ambiguity and positively stimulate consumers' satisfaction levels (Chung et al., 2020). As stated by Hsu and Lin (2023) and Jiang et al. (2022) dialogic communication might significantly develop the association between the firm and its consumers to foster their satisfaction levels towards chatbot services.

The association between AI-powered chatbots and consumers' satisfaction/service quality can be elucidated by social-exchange theory, which theorizes that consumer satisfaction/service quality is based upon their cost-benefit-analysis (Emerson, 1977). Put differentially, if consumers perceive that the benefits of ChatGPT/chatbot interaction are more than its costs they are expected to be more satisfied while utilizing ChatGPT/chatbot services (Xu et al., 2023). AI-powered technologies may produce developments in productivity and service quality (Chen et al., 2022) and might be employed to increase human service staff (Paul et al., 2023). Authors such as Chung et al. (2020) and Jiang et al. (2022) further substantiated that AI-powered technologies (chatbot) and digital media platforms (e.g. social media) stimulate consumers' satisfaction with service quality and consequently develop their subjective/psychological well-being (Paul et al., 2023), behaviours (e.g. price premium/purchase intention, recommendations, feedback for improvement), happiness (Schnebelen & Bruhn, 2018) or performance with

tourism/hotel brands/firms (Plangger et al., 2022). Following these opinions, we propose:

Proposition-7: Generative AI-powered ChatGPT would develop increased levels of satisfaction and service quality.

Proposition-8: The higher the levels of consumers' satisfaction and service quality, the higher the positive strategic outcomes.

Attitude change: a key link between AI-powered ChatGPT and strategic outcomes

Attitude is an important notion in consumer behaviour and psychology literature since it is typically acknowledged that attitude envisages behaviour, though the level of attitude-behaviour might fluctuate in many conditions (Ajzen, 1991; Maar et al., 2023; Rather, 2022). Attitude to AI devices/technology is reliant upon consumers' subjective evaluations of the overall AI experience. Attitude with AI is defined as 'a predisposition to respond in a favourable [or unfavourable] manner to stimulus' in an AI environment (Li & Wang, 2023; Lutz, 1985, p. 46). Within marketing research, greater levels of sense-of-presence of AI-based chatbot services have been established to develop user recognition and recall (Maar et al., 2023), leading to a higher positive attitude towards the chatbot services (Jiang et al., 2022). Likewise, Kasilingam (2020) identified the role of smartphone chatbots in developing users' attitudes and intentions for shopping purposes. The interactivity of chatbots was empirically explored to have a positive impact on consumer attitudes, purchase intention and willingness to use (Chung et al., 2020).

Theory-of-planned behaviour suggests the significance of intentions, which leads to actual behaviours (Ajzen, 1991). Existing digital technologies/AI literature documented how AI-based chatbot experiences can improve consumer's positive/favourable responses, including positive attitudes (Li & Wang, 2023) which, in turn, stimulates their behaviour (Jiang et al., 2022; Kasilingam, 2020), subjective well-being (Paul et al., 2023), happiness (Schnebelen & Bruhn, 2018) and/or performance (Plangger et al., 2022). Following these arguments, we posit:

Proposition-9: Generative AI-powered ChatGPT would develop the increased levels of attitude.

Proposition-10: The higher the levels of consumers' attitude, the higher the positive strategic outcomes.

Operational efficiency: a key link between AI-powered ChatGPT and strategic outcomes

Undoubtedly, due to the advancement of AI-powered technologies (e.g. ChatGPT, chatbots) and smart/e-

tourism is affecting tourism and hospitality operations, revenue management, human resources (e.g. employee augmentation and workflow optimization) and other operational-led strategies (e.g. resource allocation, scheduling, supply-chain-management (SCM) or reservation management) in a significant means and might continually to do in future (Carvalho & Ivanov, 2023; Dogru et al., 2023; Dwivedi, Kshetri, et al., 2023). Adopting AI-powered technologies induces problem-solving with elevated speed, higher accuracy and a larger quantity of inputs (Dogru et al., 2023; Prentice et al., 2020). In light of this, various firms/brands are shifting from remote monitoring to control optimization and higher autonomous AI-powered systems to improve their functionality, incorporating SCM (Toorajipour et al., 2021). Hospitality and tourism firms/brands might build long-standing and strategic investment decisions while adopting AI-powered technologies and leverage their capabilities to develop other existing capabilities/resources (Prentice et al., 2020). The insights produced by AI-powered technologies might be employed to create staff augmentation, inventory management, strategic sales, SCM and other cost-led decisions to enhance overall business efficiency and consequent profitability (Dogru et al., 2023; Dwivedi, Kshetri, et al., 2023). These AI-powered technologies have also pervaded to tourism and hospitality industries in enhancing business operational efficiency, performance and consequent consumer behaviour (e.g. loyalty, recommendations and feedback) or psychological well-being (Hsu & Lin, 2023; Koo et al., 2023; Ozturk et al., 2023).

Proposition-11: Generative AI-powered ChatGPT would develop increased levels of operational efficiency.

Proposition-12: The higher the levels of operational efficiency, the higher the positive strategic outcomes.

Technology readiness, experience type, prior visitation, generation cohorts: important moderating factors between AI-powered ChatGPT, intermediate conditions and outcomes

Technology readiness refers to the consumers' "propensity to embrace and use new technologies [e.g. tourism/hospitality AI-powered ChatGPT] to accomplish [their] goals" (Parasuraman, 2000, p. 308) and has been documented as an important driver of consumers' experience, engagement, attitudes and behaviour towards and the use of particular (e.g. tourism/hotel-based) AI/digital technologies (Rather et al., 2021). With regard to experience type, for visitors' experiences in tourism marketing (hotels, restaurants, destinations), AI

technologies offer rich information and a realistic/reliable preview experience (Aslam, 2023; Dwivedi, Kshetri, et al., 2023; Fan et al., 2022). Such aspects decrease the risk perceptions and provide a try once one can purchase experience (e.g. Flavián et al., 2020).

Regarding prior visitation, individuals perceive tourism-destination images/texts differently, depending upon whether they have been there in precedent times or currently (Rather et al., 2021). Furthermore, Gen-X consumers (1965–1980) expected to be risk-avoiding and pragmatic, while younger generations (i.e. Gen-Z, 1997–2012) utilized to switch between many digital-devices and feel their use naturally (Maar et al., 2023). As per García-Carrión et al. (2023) older generations usually invest maximum efforts to utilize technological applications/devices, while younger generations perceive the use of novel technologies as effortless. Following these advice, technology readiness, experience type, prior visitation and generation cohorts strongly moderate the relation between AI-powered ChatGPT and intermediate conditions (experience, engagement, attachment, satisfaction, attitude and operational efficiency) on the one hand and strategic outcomes (behaviour, subjective/psychological well-being, happiness and performance) on the other hand, thus, leads to following propositions:

Proposition-13a–f: Technology readiness, experience type, prior visitation and generation cohorts strongly moderate the relationship relating to AI-powered ChatGPT and intermediate conditions of the anticipated framework.

Proposition-14a–f: Technology readiness, experience type, prior visitation and generation cohorts strongly moderate the relationship relating to intermediate conditions and strategic outcomes of the anticipated framework.

Discussion, implications and future research roadmap

Digital transformation through AI-powered tools, (e.g. ChatGPT, chatbots, metaverse, VR/AR or internet-of-things), machine learning and e-tourism/smart tourism can revolutionise consumer research field (Bulchand-Gidumal et al., 2023; Dogru et al., 2023; Dwivedi, Pandey, et al., Dwivedi, Pandey, et al., 2023; Koo et al., 2023). The present study aims to advance academic discussion with reference to AI-powered ChatGPT in tourism, hospitality and marketing, and its potential benefits, challenges, and impacts on the tourism/hospitality industry. This article contributed to extant research across various fields to broaden the generative AI-powered ChatGPT, intermediate-conditions (e.g.

customer experience, customer engagement/trust, attachment, satisfaction/service quality, attitude change and operational efficiency) and strategic outcomes (e.g. behaviours, subjective/psychological well-being, happiness and performance) within a novel conceptual-framework. We develop a proposed framework from a combination of research linking generative AI technology-powered ChatGPT, chatbots, digital technologies (e.g. VR/AR/XR, metaverse), machine learning, smart/e-tourism, consumer experience, consumer behaviour, engagement, satisfaction, attitude, happiness or well-being from the subjects of information technology, psychology, hospitality, tourism and marketing management to impart strong theoretical-fundamentals for upcoming AI-powered ChatGPT research.

This article proposed/developed a novel conceptual framework for the effects of AI-powered ChatGPT on important interactions and strategic outcomes with different sets of research propositions. The study offers important theoretical manifestations to impart significant future research directions and a roadmap for the implementation of AI-powered ChatGPT that integrates a computer-mediated environment, intermediate conditions, strategic outcomes, mediating variables and moderating factors within the tourism and hospitality industry. The paper analyzes the benefits of ChatGPT while addressing the impending practices, pitfalls, or challenges linked with AI technology in tourism, hospitality, destination or marketing settings for arketing scientists, psychologists, statisticians, sociologists and economists to explore the domain of AI-powered ChatGPT.

Future-research roadmap

Various strategic research domains, research questions and streams regarding the AI-powered ChatGPT, tourism/hospitality marketing and consumer research, consumer experience, engagement and behaviours comprise: (1) How hospitality/tourism firms/brands collaborate in AI-powered ChatGPT/chatbot to promote customer's experience, engagement/trust, attachment, satisfaction/service quality, attitude change and operational efficiency? (2) What impels consumer experience, engagement/trust, attachment, satisfaction/service quality, attitude change and operational efficiency in AI-powered ChatGPT? (3) Can AI-powered ChatGPT build the efficiency of customer's behaviour (loyalty, feedback/recommendations), subjective well-being, psychological well-being, happiness and brand performance? (4) To what extent does AI-powered ChatGPT improve customer service enhancement (e.g. customer satisfaction, loyalty, service quality, consumer service

Table 2. Future research roadmap/directions on generative AI technology-based ChatGPT in tourism, hospitality and marketing management.

Research domains/research stream/research questions

Consumer research, psychology, behaviours, attitudes

1. How are consumer behaviours, subjective/psychological well-being and happiness affected in AI-powered ChatGPT?
2. To what degree does customer behaviour data from AI-powered ChatGPT link with customer behaviour data from the physical or real world?
3. How would marketing scientists, psychologists, statisticians, sociologists and economists adopt/use AI-powered ChatGPT to evaluate consumer behaviour?
4. How do customers react to AI-powered ChatGPT marketing offers, promotions or sales contrasted with physical offerings?
5. What are the most recent and innovative methods that might be used in AI-powered ChatGPT to conduct market research?

Consumers' pre-, during- and post-trip planning

6. How AI-powered ChatGPT will affect the users' (e.g. consumers/visitors) decision-making processes and willingness to stay in a hotel brand or travel to a destination before the trip?
7. How does AI-powered ChatGPT operate industry value to tourist destinations/sites and/or hospitality brands/companies?
8. What inspires (de-motivates) tourism businesses to adopt AI-powered ChatGPT in trip planning?
9. To what level does the adoption of AI-powered ChatGPT impact consumers' information search, decision-making and purchase behaviour in pre-, during and post-trip stages?

Business domains/areas

10. How does AI-powered ChatGPT affect the efficiency of personalized marketing contents in the tourism and hospitality industry (e.g. increasing booking experiences, marketing communications and offering personalized experiences, services and products)?
11. Which functional areas (marketing, operations, human resource, strategic management, finance, etc.) in tourism and hospitality are AI-powered ChatGPT expected to influence the most?
12. To what extent does AI-powered ChatGPT influence the nexus between the real-time-response performance of online reviews, sentiment analysis and key performance indicators?
13. How do employees, consumers and other stakeholders perceive privacy, legal and ethical issues related to the use of AI-powered ChatGPT?
14. How can AI-powered ChatGPT be employed as a tool for cross-selling within the tourism and hospitality industry?

Societal perspective

15. What are the roles tourism/hotel firms/brands should allow to play regarding AI-powered ChatGPT?
16. What security mechanisms may protect consumers/users of AI-powered ChatGPT?
17. Can AI-powered ChatGPT decrease social isolation and assist in connecting visitors?
18. What are the key challenges/dark sides of AI-powered ChatGPT and the role of social marketing?
19. How could the tourism and hospitality industry ensure that its adoption of AI-powered ChatGPT is ethical and practical, while also safeguarding the privacy and rights of its consumers?
20. How can AI-powered ChatGPT assist tourism and hospitality companies/brands become more sustainable in the business process?

Mediating variables• *Theorized-mediators*

21. What impels consumer experience, engagement/trust, attachment, satisfaction/service quality, attitude change and operational efficiency in AI-powered ChatGPT?

Moderating factors• *Technology, experience type, prior visitation and generation cohorts*

22. To what level does technology readiness moderate/regulate the relationship between AI-powered ChatGPT and intermediate conditions?
23. How does experience type and prior visitation affect the value co-created in AI-powered ChatGPT?
24. To what level do generation cohorts (i.e. Gen Z and Gen Y) moderate/regulate the relationship between AI-powered ChatGPT and intermediate conditions?

Tourism/hospitality management and marketing strategies/practices

25. To what extent are existing hospitality, tourism and marketing management strategies or practices appropriate in AI-powered ChatGPT?
26. How do hospitality/tourism firms/brands collaborate in AI-powered ChatGPT/chatbot to promote customer's experience, engagement/trust, attachment, satisfaction/service quality, attitude change and operational efficiency?
27. Can AI-powered ChatGPT build the efficiency of customers' behaviour (loyalty, feedback/recommendations), subjective well-being, psychological well-being, happiness and brand performance?
28. To what extent does AI-powered ChatGPT improve customer service enhancement (e.g. customer satisfaction, loyalty, service quality, consumer service processes), customer engagement (e.g. brand perception, customer trust, personalized marketing) and operational efficiency (e.g. resource allocation, scheduling, supply-chain-management, reservation management, employee augmentation, workflow optimization) in the hospitality and tourism industry?
29. Which important organizational-led outcomes (e.g. performance, engagement, price premium purchase intention, etc.) of AI-powered ChatGPT from the employee standpoint?
30. How in AI-powered ChatGPT would build the competitiveness of the tourism/hospitality business?
31. What tourism/marketing strategies and practices can be adopted to develop and satisfy psychological-led identity differences in the AI-powered ChatGPT context?
32. How does AI-powered ChatGPT meet consumers' wants and needs, specifically for challenging markets that need accessibility?
33. What inspires (de-motivates) tourism and hotel businesses to adopt AI-powered ChatGPT in marketing and management?
34. To what extent does AI-powered ChatGPT assist in enhancing the accessibility of tourism sites/destinations?
35. To what extent does AI-powered ChatGPT augment the development of transformative tourism-/hospitality-based service experiences?

processes), customer engagement (e.g. brand perception, customer trust, personalized marketing) and operational efficiency (e.g. resource allocation, scheduling, supply-chain-management, reservation management, employee augmentation, workflow optimization) in the hospitality and tourism industry? (5) To what level does technology readiness, moderate/regulate the relationship between AI-powered ChatGPT and

intermediate conditions? (6) To what extent does AI-powered ChatGPT augment the development of transformative tourism/hospitality-based service experiences? (7) To what extent does existing hospitality, tourism and marketing management strategies or practices are appropriate in AI-powered ChatGPT? (8) What are the most recent and innovative methods that might be used in AI-powered ChatGPT to conduct

market research? The anticipated future research roadmap/directions must inspire other explorations, as presented in Table 2.

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References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Aslam, U. (2023). Understanding the usability of retail fashion brand chatbots: Evidence from customer expectations and experiences. *Journal of Retailing and Consumer Services*, 74, 103377. <https://doi.org/10.1016/j.jretconser.2023.103377>
- Baek, T. H., & Kim, M. (2023). Is ChatGPT scary good? How user motivations affect creepiness and trust in generative artificial intelligence. *Telematics and Informatics*, 83, 102030. <https://doi.org/10.1016/j.tele.2023.102030>
- Bagozzi, R. P. (1991). The self-regulation of attitudes, intentions, and behavior. *Social Psychology Quarterly*, 55(2), 178–204. <https://doi.org/10.2307/2786945>
- Bankmycell. (2023). ChatGPT number of users & market size statistics, Aug 2023. <https://www.bankmycell.com/blog/chatgpt-number-of-users>
- Becker, L., & Jaakkola, E. (2020). Customer experience: Fundamental premises and implications for research. *Journal of the Academy of Marketing Science*, 48(4), 630–648. <https://doi.org/10.1007/s11747-019-00718-x>
- Bowlby, J. (1969). *Attachment and loss: Attachment* (Vol. 1). Basic Books.
- Buhalis, D. (2020). Technology in tourism-from information communication technologies to eTourism and smart tourism towards ambient intelligence tourism: A perspective article. *Tourism Review*, 75(1), 267–272. <https://doi.org/10.1108/TR-06-2019-0258>
- 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. <https://doi.org/10.1108/JOSM-12-2018-0398>
- Bulchand-Gidumal, J., William Secin, E., O'Connor, P., & Buhalis, D. (2023). Artificial intelligence's impact on hospitality and tourism marketing: Exploring key themes and addressing challenges. *Current Issues in Tourism*, 1–18. <https://doi.org/10.1080/13683500.2023.2229480>
- Carvalho, I., & Ivanov, S. (2023). ChatGPT for tourism: Applications, benefits and risks. *Tourism Review*. <https://doi.org/10.1108/TR-02-2023-0088>
- Casais, B., & Ferreira, L. (2023). Smart and sustainable hotels: Tourism agenda 2030 perspective article. *Tourism Review*, 78(2), 344–351. <https://doi.org/10.1108/TR-12-2022-0619>
- Chen, Q., Gong, Y., Lu, Y., & Tang, J. (2022). Classifying and measuring the service quality of AI chatbot in frontline service. *Journal of Business Research*, 145, 552–568. <https://doi.org/10.1016/j.jbusres.2022.02.088>
- Chung, M., Ko, E., Joung, H., & Kim, S. J. (2020). Chatbot e-service and customer satisfaction regarding luxury brands. *Journal of Business Research*, 117, 587–595. <https://doi.org/10.1016/j.jbusres.2018.10.004>
- Dogru, T., Line, N., Mody, M., Hanks, L., Abbott, J. A., Acikgoz, F., Assaf, A., Bakir, S., Berbekova, A., Bilgihan, A., Dalton, A., Erkmen, E., Geronasso, M., Gomez, D., Graves, S., Iskender, A., Ivanov, S., Kizildag, M., Lee, M., & Zhang, T. (2023). Generative artificial intelligence in the hospitality and tourism industry: Developing a framework for future research. *Journal of Hospitality & Tourism Research*. <https://doi.org/10.1177/1096348023118866>
- Dwivedi, Y. K., Kshetri, N., Hughes, L., Slade, E. L., Jeyaraj, A., Kar, A. K., ... Wright, R. (2023). So what if ChatGPT wrote it?" Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy. *International Journal of Information Management*, 71, 102642. <https://doi.org/10.1016/j.ijinfomgt.2023.102642>
- Dwivedi, Y. K., Pandey, N., Currie, W., & Micu, A. (2023). Leveraging ChatGPT and other generative artificial intelligence (AI)-based applications in the hospitality and tourism industry: Practices, challenges and research agenda. *International Journal of Contemporary Hospitality Management*. Online first.
- Emerson, R. M. (1977). Social exchange theory. *Annual Review of Sociology*, 2(1), 335–362. <https://doi.org/10.1146/annurev.so.02.080176.002003>
- Fan, X., Jiang, X., & Deng, N. (2022). Immersive technology: A meta-analysis of augmented/virtual reality applications and their impact on tourism experience. *Tourism Management*, 91, 104534. <https://doi.org/10.1016/j.tourman.2022.104534>
- Flavián, C., Ibáñez-Sánchez, S., & Orús, C. (2020). Integrating virtual reality devices into the body: Effects of technological embodiment on customer engagement and behavioral intentions toward the destination. *Journal of Travel & Tourism Marketing*, 36(7), 847–863. <https://doi.org/10.1080/10548408.2019.1618781>
- Forbes. (2023). Microsoft's plan to infuse AI and chatgpt into everything, March 6, 2023. <https://www.forbes.com/sites/bernardmarr/2023/03/06/microsofts-plan-to-infuse-ai-and-chatgpt-into-everything/?sh=52545f9653fc>
- García-Carrión, B., Del Barrio-García, S., Muñoz-Leiva, F., & Porcu, L. (2023). Effect of social-media message congruence and generational cohort on visual attention and information-processing in culinary tourism: An eye-tracking study. *Journal of Hospitality and Tourism Management*, 55, 78–90. <https://doi.org/10.1016/j.jhtm.2023.03.006>
- Gretzel, U., Sigala, M., Xiang, Z., & Koo, C. (2015). Smart tourism: Foundations and developments. *Electronic Markets*, 25(3), 179–188. <https://doi.org/10.1007/s12525-015-0196-8>

- Gursoy, D., Li, Y., & Song, H. (2023). ChatGPT and the hospitality and tourism industry: An overview of current trends and future research directions. *Journal of Hospitality Marketing & Management*, 32(5), 579–592. <https://doi.org/10.1080/19368623.2023.2211993>
- Hsu, C. L., & Lin, J. C. C. (2023). Understanding the user satisfaction and loyalty of customer service chatbots. *Journal of Retailing and Consumer Services*, 71, 103211. <https://doi.org/10.1016/j.jretconser.2022.103211>
- Jiang, H., Cheng, Y., Yang, J., & Gao, S. (2022). AI-powered chatbot communication with customers: Dialogic interactions, satisfaction, engagement, and customer behavior. *Computers in Human Behavior*, 134, 107329. <https://doi.org/10.1016/j.chb.2022.107329>
- Kasilingam, D. L. (2020). Understanding the attitude and intention to use smartphone chatbots for shopping. *Technology in Society*, 62, 101280. <https://doi.org/10.1016/j.techsoc.2020.101280>
- Kim, J., Kim, J. H., Kim, C., & Park, J. (2023). Decisions with ChatGPT: Reexamining choice overload in ChatGPT recommendations. *Journal of Retailing and Consumer Services*, 75, 103494. <https://doi.org/10.1016/j.jretconser.2023.103494>
- Koo, C., Kwon, J., Chung, N., & Kim, J. (2023). Metaverse tourism: conceptual framework and research propositions. *Current Issues in Tourism*, 26(20), 3268–3274.
- Li, M., & Wang, R. (2023). Chatbots in e-commerce: The effect of chatbot language style on customers' continuance usage intention and attitude toward brand. *Journal of Retailing and Consumer Services*, 71, 103209. <https://doi.org/10.1016/j.jretconser.2022.103209>
- Lutz, R. J. (1985). Affective and cognitive antecedents of attitude toward the Ad: A conceptual framework. In L. F. Alwitt & A. A. Mitchell (Eds.) *Psychological Processes and Advertising Effects: Theory, Research and Application* (Pp. 45–63). Lawrence Erlbaum Associates.
- Maar, D., Besson, E., & Kefi, H. (2023). Fostering positive customer attitudes and usage intentions for scheduling services via chatbots. *Journal of Service Management*, 34(2), 208–230. <https://doi.org/10.1108/JOSM-06-2021-0237>
- Maslow, A. H. (1944). A theory of human motivation. *Psychological Review*, 50(4), 370. <https://doi.org/10.1037/h0054346>
- Mich, L., & Garigiano, R. (2023). ChatGPT for e-Tourism: A technological perspective. *Information Technology & Tourism*, 25, 1–12. <https://doi.org/10.1007/s40558-023-00248-x>
- Ozturk, A. B., Pizam, A., Hacikara, A., An, Q., Chaulagain, S., Balderas-Cejudo, A., ... State, O. (2023). Hotel customers' behavioral intentions toward service robots: The role of utilitarian and hedonic values. *Journal of Hospitality and Tourism Technology*, 14(5), 780–801. <https://doi.org/10.1108/JHTT-07-2022-0223>
- Parasuraman, A. (2000). Technology readiness index (TRI): A multiple-item scale to measure readiness to embrace new technologies. *Journal of Service Research*, 2(4), 307–320. <https://doi.org/10.1177/109467050024001>
- Parasuraman, A. B. L. L., Zeithaml, V. A., & Berry, L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, 64(1), 12–40.
- Paul, J., Ueno, A., & Dennis, C. (2023). ChatGPT and consumers: Benefits, pitfalls and future research agenda. *International Journal of Consumer Studies*, 47(4), 1213–1225. <https://doi.org/10.1111/ijcs.12928>
- Peng, J., Yang, X., Fu, S., & Huan, T. C. T. (2023). Exploring the influence of tourists' happiness on revisit intention in the context of traditional Chinese medicine cultural tourism. *Tourism Management*, 94, 104647. <https://doi.org/10.1016/j.tourman.2022.104647>
- Pentina, I., Hancock, T., & Xie, T. (2023). Exploring relationship development with social chatbots: A mixed-method study of replika. *Computers in Human Behavior*, 140, 107600. <https://doi.org/10.1016/j.chb.2022.107600>
- Pizam, A., Ozturk, A. B., Balderas-Cejudo, A., Buhalis, D., Fuchs, G., Hara, T., ... Chaulagain, S. (2022). Factors affecting hotel managers' intentions to adopt robotic technologies: A global study. *International Journal of Hospitality Management*, 102, 103139. <https://doi.org/10.1016/j.ijhm.2022.103139>
- Pizzi, G., Scarpi, D., & Pantano, E. (2021). Artificial intelligence and the new forms of interaction: Who has the control when interacting with a chatbot? *Journal of Business Research*, 129, 878–890. <https://doi.org/10.1016/j.jbusres.2020.11.006>
- Plangger, K., Grewal, D., de Ruyter, K., & Tucker, C. (2022). The future of digital technologies in marketing: A conceptual framework and an overview. *Journal of the Academy of Marketing Science*, 50(6), 1125–1134. <https://doi.org/10.1007/s11747-022-00906-2>
- Prentice, C., Dominique Lopes, S., & Wang, X. (2020). The impact of artificial intelligence and employee service quality on customer satisfaction and loyalty. *Journal of Hospitality Marketing & Management*, 29(7), 739–756. <https://doi.org/10.1080/19368623.2020.1722304>
- Rather, R. (2020). Customer experience and engagement in tourism destinations: The experiential marketing perspective. *Journal of Travel & Tourism Marketing*, 37(1), 15–32. <https://doi.org/10.1080/10548408.2019.1686101>
- Rather, R. (2023). Metaverse marketing and consumer research: Theoretical framework and future research agenda in tourism and hospitality industry. *Tourism Recreation Research*, 1–9. <https://doi.org/10.1080/02508281.2023.2216525>
- Rather, R. A. (2022). Monitoring the impacts of tourism-based social media, risk perception and fear on tourist's attitude and revisiting behaviour in the wake of COVID-19 pandemic. *Current Issues in Tourism*, 24(23), 3275–3283. <https://doi.org/10.1080/13683500.2021.1884666>
- Rather, R., Hollebeek, L. D., Loureiro, S. M. C., Khan, I., & Hasan, R. (2023). Exploring tourists' virtual reality-based brand engagement: A uses-and-gratifications perspective. *Journal of Travel Research*, 00472875231166598. Online First.
- Rather, R., Hollebeek, L. D., & Rasoolimanesh, S. M. (2021). First-time versus repeat tourism customer engagement, experience, and value cocreation: An empirical investigation. *Journal of Travel Research*, 61(3), 549–564. <https://doi.org/10.1177/0047287521997572>
- Rather, R., Hollebeek, L. D., Vo-Thanh, T., Ramkissoon, H., Leppiman, A., & Smith, D. (2022). Shaping customer brand loyalty during the pandemic: The role of brand credibility, value congruence, experience, identification, and engagement. *Journal of Consumer Behaviour*, 21(5), 1175–1189. <https://doi.org/10.1002/cb.2070>
- Revfine. (2023). ChatGPT hospitality guide: How chatgpt can help the hospitality industry. <https://www.revfine.com/chatgpt-hospitality/>

- Schnebelen, S., & Bruhn, M. (2018). An appraisal framework of the determinants and consequences of brand happiness. *Psychology and Marketing*, 35(2), 101–119. <https://doi.org/10.1002/mar.21073>
- Statista. (2023). Artificial Intelligence (AI) market size/revenue comparisons 2018-2030. Retrieved June 26, 2023, from <https://www.statista.com/statistics/941835/artificial-intelligence-market-size-revenue-comparisons/>.
- Tourism and Hospitality Market Forecast. (THMF). (2023). Tourism and hospitality market size (2022-2027). Retrieved April 20, 2023, from www.marketdataforecast.com/market-reports/tourism-and-hospitalitymarket.
- Toorajipour, R., Sohrabpour, V., Nazarpour, A., Oghazi, P., & Fischl, M. (2021). Artificial intelligence in supply chain management: A systematic literature review. *Journal of Business Research*, 122, 502–517. <https://doi.org/10.1016/j.jbusres.2020.09.009>
- Wong, I. A., Lian, Q. L., & Sun, D. (2023). Autonomous travel decision-making: An early glimpse into ChatGPT and generative AI. *Journal of Hospitality and Tourism Management*, 56, 253–263. <https://doi.org/10.1016/j.jhtm.2023.06.022>
- Wu, H. C., & Cheng, C. C. (2018). Relationships between technology attachment, experiential relationship quality, experiential risk and experiential sharing intentions in a smart hotel. *Journal of Hospitality and Tourism Management*, 37, 42–58. <https://doi.org/10.1016/j.jhtm.2018.09.003>
- Yang, X., & Zhang, L. (2022). Smart tourism technologies towards memorable experiences for museum visitors. *Tourism Review*, 77(4), 1009-1023.
- Xu, Y., Niu, N., & Zhao, Z. (2023). Dissecting the mixed effects of human-customer service chatbot interaction on customer satisfaction: An explanation from temporal and conversational cues. *Journal of Retailing and Consumer Services*, 74, 103417. <https://doi.org/10.1016/j.jretconser.2023.103417>