What drives the adoption of artificial intelligence among consumers in the hospitality sector: a systematic literature review and future agenda

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Abstract

Purpose – This study aims to identify, review and synthesize existing literature on key theories, drivers and barriers affecting consumer adoption or resistance to artificial intelligence (AI) in the hospitality sector.

Design/methodology/approach – This study aims to conduct a complete literature review of the accrued knowledge generated so far on AI in the hospitality sector. To attain the overall objectives of this study, we used the systematic literature review (SLR) method. This method systematically handles the diversity of knowledge in a specific topic to answer precise research questions. It also generates new visions through a synthesis of the literature, to identify the knowledge gaps, set the new directions for the future researcher and provide sufficient guidance to inform the policy and practice.

Findings – The findings of this study are presented in three sections, as follows: descriptive analysis, content analysis and synthesized framework. The findings highlighted the state-of-the-art mapping of the existing research in terms of publication frequency over time and across publication outlets, key theories, methods and geographies. In addition, literature on consumer adoption (or resistance) of AI in hospitality is content analyzed to highlight key drivers and barriers. Moreover, this review critically evaluates extant literature and sets future agendas by postulating specific research questions for further knowledge development in this field of study.

Research limitations/implications – The SLR focused on consumer adoption or resistance to use AI in hospitality literature. The future researcher may include additional streams to get better results.

Practical implications – The study findings will help multiple stakeholders to understand the underlying causes of customer resistance or barriers to the intention to use/adopt AI services in the hotel sector. Furthermore, study results will allow them to better analyze the relationship between customer barriers, intents or consumer decision behaviors.

Originality/value – First, this study provides a comprehensive synthesis of the literature on the consumer adoption or resistance of AI in hospitality. This study categorizes the existing diversified literature in two main themes – drivers and barriers – to present a simplistic picture of the existing literature. Second, the review highlights the gaps and limitations in existing research and provides guidance for future scholars. Third, the key contribution of this review is the development of a unified framework on the consumer adoption or resistance of AI in the hospitality sector. That is, this study puts forward the behavioral reasoning theory framework and suggests that future research

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using this lens will immensely contribute to existing literature. Finally, this study facilitates the practitioners to understand the key motivating and hindering factors affecting the adoption and resistance behavior.

Keywords Artificial intelligence, Robotics, Hospitality, Systematic review

Paper type Literature review

在酒店业中消费者采用人工智能的驱动因素：一项系统文献综述和未来研究议程

摘要

研究目的 – 本研究旨在识别、回顾和综合现有文献，以了解影响消费者在酒店业采用或抵制人工智能（AI）的关键理论、驱动因素和障碍。

研究方法 – 本研究采用系统文献综述（SLR）方法，从Web of Science和Scopus数据库中选择并审查了81篇已发表研究，涉及消费者在酒店业中采用（或抵制）AI的因素。

研究发现 – 本研究的发现分为三个部分，i）描述性分析，ii）内容分析，iii）综合框架。我们的研究突出了现有研究的最新发展，包括随时间和出版渠道的出版频率、关键理论、方法和地理位置。此外，对酒店业中消费者对AI采用（或抵制）的文献进行内容分析，以突出关键的驱动因素和障碍。此外，这项综述通过提出特定的研究问题，批判性评估了现有文献，并为该领域的知识发展设定了未来议程。

研究创新 – 本综述基于行为推理理论。一个关键的发现是为未来研究人员提供了一个全面的框架，以研究迄今为止在这个研究领域中尚不为人知的内容。

关键词 人工智能，机器人技术，酒店业，系统性综述。

文章类型 研究型论文

1. Introduction

Over the years, technology has become an important part of our lives, consequently improving our quality of life, health and welfare (Zhong *et al.*, 2020a, 2020b). Among other technological improvements, adopting artificial intelligence (AI) is becoming the new normal in this technological era (Özen and Özgül Katlav, 2023). AI technology has grown much faster than expected, already entered various fields (e.g. engineering, banking, medical treatment and hospitality) to cooperate with or entirely replace humans (Mingotto *et al.*, 2020). Notably, the application of AI in the services sector has developed rapidly with continuous developments in the labor-intensive hospitality sector (Ivanov *et al.*, 2018; Ivanov *et al.*, 2019; Zhong *et al.*, 2020a, 2020b).

The hospitality sector is the fastest-growing industry in the world (Webster and Ivanov, 2020). It generates approximately $8tn and creates 292 million jobs worldwide (Ruel and Njoku, 2020). The rise of AI application is transforming business models with new opportunities and benefits for hospitality sector (Wu *et al.*, 2021). For instance, it facilitates humans to complete their tasks efficiently by quickly going through self-check-in or out, room services, housekeeping, concierge services and chatbot interactions to collect the required information (Li *et al.*, 2021; Parvez, 2020; Wong *et al.*, 2023; Zhu *et al.*, 2023). Moreover, it reduces human costs and improves service efficiency. Ostensibly, recent studies have also cautioned that robots will replace human employment soon (Bowen and Morosan, 2018; Jiang and Wen, 2020; Webster and Ivanov, 2020).

Scholars have predominantly focused their investigations on the costs and benefits of using AI in the hospitality sector (Chi *et al.*, 2020). For instance, previous studies have reported several advantages of using AI for customers (e.g. reducing service costs, time-saving and efficient services), for employees (e.g. reduced workloads and enhanced productivity) and for organizations (e.g. operational efficiency, cost reduction and increased revenues) (Alma Çallı *et al.*, 2023; Buhalis and Moldavska, 2022; Çakar and Aykol, 2021). A distinct research stream in this realm is examining the acceptance and rejection of AI technology among consumers.

In this regard, some studies have reported that customers believe AI services as convenient and efficient (Mingotto *et al.*, 2020), while others have highlighted the low level of consumer acceptance due to the complexity and lack of knowledge (Kong *et al.*, 2021; Li *et al.*, 2021; Rasheed *et al.*, 2023).

Despite immense scholarly advancements in the consumer adoption of AI in hospitality, our understanding is somewhat limited. Moreover, given that literature reviews provide a comprehensive and simplistic picture of the existing scholarship and facilitate the advancements of future developments (Mukherjee *et al.*, 2022), the absence of a literature synthesis on this topic is surprising. Although there are literature review studies on this topic, our review is novel and distinct in several ways. Table 1 compares the current study against existing literature reviews to highlight the originality of this study. Against these backgrounds, this study aims to review the accrued knowledge on consumer adoption (or resistance) of AI in the hospitality sector for the following reasons. The constantly increasing number of empirical studies and the fragmentation of scholarly research in this field of study complicates our understanding of literature developments and progressions on this topic. A clear mapping of the existing literature is needed to highlight the overall research profile. Reviewing the prior literature on AI technology acceptance and rejection among consumers reports equivocal findings. Therefore, a literature synthesis of the factors influencing consumer adoption of AI in hospitality is required to provide a knowledge base of what is known on this topic. Critical reviews assist in evaluating extant knowledge to highlight key issues, knowledge gaps and limitations to provide directions for future knowledge development. Table 2 presents the development of this review's research questions and potential contributions. Previous studies on AI adoption have largely used behavioral models (e.g. theory of planned behavior [TPB], theory of reasoned action [TRA] and technology acceptance model [TAM]) and these theoretical frameworks borrowed from other academic disciplines. For further advancements and a nuanced understanding of the factors affecting consumer adoption of AI, a new theoretical lens is needed to investigate unknown factors (e.g. consumers resist new product or services).

2. Methodology

This study used the systematic literature review (SLR) technique to manage the diversity of knowledge production on this topic and answering the RQs of this review. SLRs generate new insights by synthesizing and evaluating current literature to identify the knowledge gaps, set new directions for future knowledge development and provide sufficient guidance to inform policy and practice (Khizar *et al.*, 2022; Tranfield *et al.*, 2003). SLRs are objective, systematic, replicable and comprehensive; however, the data collection and analysis methods in an SLR study are the same as those reporting the empirical studies.

2.1 Data collection

2.1.1 Search strategy. In agreement with the recent SLR studies (Khizar *et al.*, 2022), we used a systematic search approach to identify and select potentially relevant articles. After scoping review on this topic and consultation with the scholars, we finalized the following search string: **(**Artificial Intelligence" OR Artificial-Intelligence OR AI OR Robot*) AND (Hotel* OR Restaurant* OR Hospitality) AND (Customer* OR Consumer*). The Web of Science and Scopus databases were used for articles search because of their recognition and comprehensive coverage of academic literature in business management fields (Goodell *et al.*, 2021; Kumar *et al.*, 2022).

2.1.2 Criteria for the inclusion and exclusion of studies. Given the specificity of the RQs, we developed the following inclusion criteria:

- include both empirical and nonempirical studies;
- relevant to AI in the hospitality sector;

Sources/ author(s)	Method(s)	Study focus and key findings
Cain *et al.* (2019)	Systematic review 12 articles published in tourism, leisure, and hospitality journals in SCIMAGO	• Review of hospitality literature on the state of AI/robots • Highlights existing knowledge and recommends future application and research opportunities
Reis *et al.* (2020)	Systematic review 397 papers selected from Scopus	• Discovers pros and cons of using robots in hospitality • Indicate that service robot overtake humans when performing uniform tasks in high customer contact settings because of their analytical nature
Samara *et al.* (2020)	Systematic review 102 papers selected from multiple databases	• Discusses the role and benefits of big data and AI in tourism • Suggests that adopting AI and big data strategies increases productivity, efficiency and profitability
Doborjeh *et al.* (2021)	Systematic review 146 articles from tourism and hospitality literature in A* and A category journals	• Evaluates AI methods and applications in hospitality (e.g. data modeling for forecasting) • AI methods for building multimodal data sets in tourism and hospitality
Shin (2022)	Critical review 38 articles from tourism and hospitality literature from multiple databases	• The associations among robots and each of the four multilevel participants of the service ecosystem – management, customer, employee and society – were analyzed • Proposed topics: robotics–employee, robotics–management, robotics–customer and robotics–society relationships
Present study	Systematic literature review 81 articles were identified from the tourism, hospitality, marketing, management and business journals listed in ABDC rankings (A*, A, and B)	• A review and synthesis approach to delineating existing literature into key theories, drivers (i.e. functional, social, psychological and contextual) and barriers (i.e. usage, value and risks) • Critical analysis of the existing scholarship to highlight key issues, limitations and emerging topics and suggests future agenda (RQs) • A novel theoretical lens of BRT is proposed for further knowledge advancements

Table 1.
Comparison of the present study with previous literature reviews

Source: Authors' own creation

Research gaps	RQs of this review	Contributions of this review
– Constantly increasing number of empirical studies and literature fragmentation on consumer adoption of AI in hospitality – Limited understanding regarding the evolution, development and progression of literature; therefore, a clear mapping of the existing research profile is required – Prior literature on consumer acceptance/resistance of AI reports equivocal findings – A comprehensive literature synthesis of the factors influencing consumer adoption of AI in hospitality is required to provide a knowledge base of what is known on this topic – Previous studies on AI adoption have largely used behavioral models (e.g. TRA, TPB and TAM) and theoretical frameworks borrowed from other academic disciplines. However, a new theoretical lens is needed to investigate unknown factors – A critical review is missing to evaluate extant research, highlight knowledge gaps, and limitations to provide directions for future knowledge development	1. What is the current status of research on consumer adoption (or resistance) of AI services in hospitality? 2. What factors affect consumer adoption (or resistance) to AI in hospitality? 3. Which theoretical framework can be used to develop further knowledge on consumer adoption (or resistance) of AI in hospitality? 4. What are the knowledge gaps and limitations in existing literature? And what are the promising future research directions?	– This review presents a holistic picture of the existing research profile regarding publication frequency, key publication outlets, methods, theories and countries – This review comprehensively synthesizes the existing literature on the driving and impeding factors of AI adoption (or resistance) to present a simplistic picture of the existing literature. We also delineate the subthemes of drivers (i.e. functional, social and psychological) and barriers (i.e. usage, risk and value) – This review suggests a unified framework of BRT to extend the debate on the consumer adoption or resistance of AI in the hospitality sector. BRT is a novel theory that can be used to explore underlying reasons and motivations of consumers – This review highlights knowledge gaps and limitations in extant scholarship and discusses the future research agenda by postulating specific RQs for future developments on this topic – Overall, the insights obtained from this review facilitate the practitioners and policymakers to understand the critical motivating and hindering factors affecting the adoption behavior and design adaptive policies

Source: Authors' own creation

Table 2. Research gaps, research questions and research contributions

- which focus on the consumer adoption (or resistance) of AI/robotics; and
- published in the English language.

Afterward, to ensure a high-quality source, articles were published in journals ranked as B and above in the Australian Business Deans Council (ABDC) journals ranking.

2.1.3 Initial search. We executed a keywords search in databases (i.e. Scopus and Web of Science) on 27-12-2022, and 1,406 initial records were identified. Next, we refined our sample based on language and document type and removed duplicates. Moreover, the articles were further screened to establish their general relevance to the RQs and the scope of this study. This process reduced our sample to 267 potentially relevant articles for this review.

2.1.4 Quality criteria. Following previous SLR studies in hospitality and tourism research (Goel *et al.*, 2022; Gupta *et al.*, 2022), we referred to the (ABDC) A*, A and B category journals of hospitality, tourism and marketing, management and business to ensure that articles selected in our review are directly relevant to the focus of this study and published in top quality journals. This procedure reduced the list of relevant papers to 137 after excluding 130.

2.1.5 Final sample. Two authors separately assessed the titles and abstracts of the selected publications and then discussed their differences to reach a consensus. This procedure reduced the list of relevant papers to 93 after excluding nonrelevant articles ($n = 44$). In the second stage, three researchers were invited to perform an independent review of the full texts of the remaining 93 articles to determine their relevancy. This limited our sample to 74 that meet the inclusion criteria and the scope of this study. Finally, we performed a forward and backward search through references and found seven additional relevant articles, which increased the final study sample to 81 (see Figure 1 below the PRISMA flow diagram).

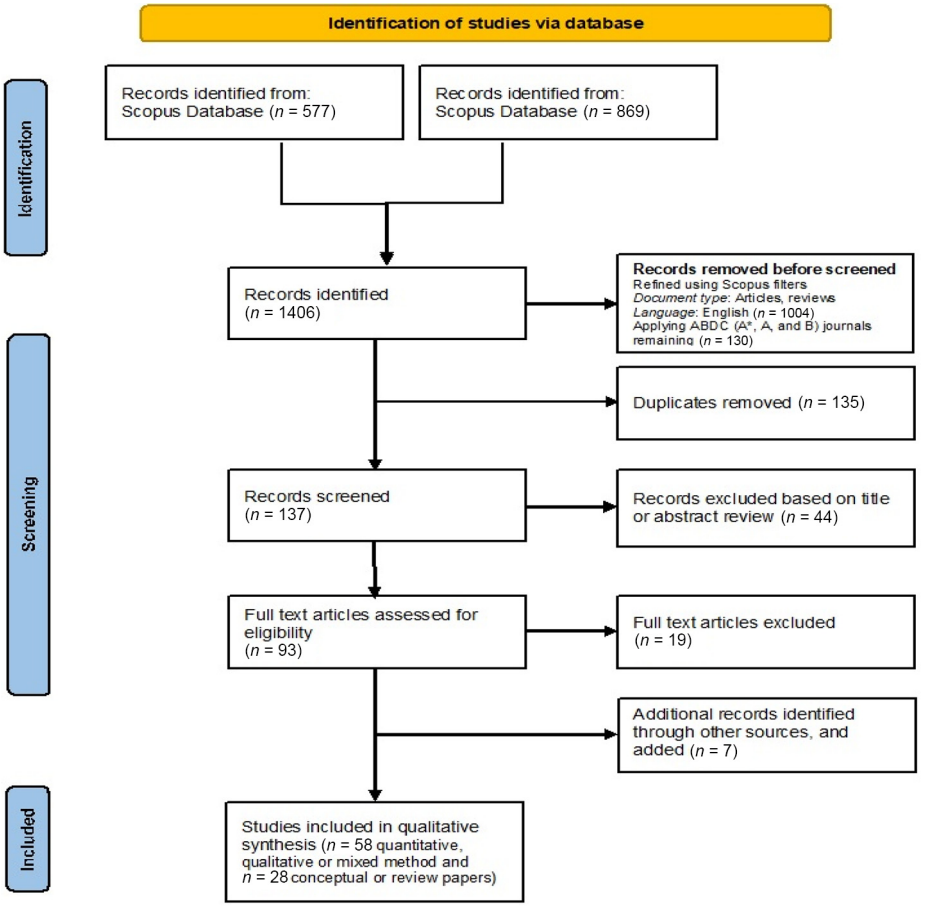

Figure 1.
PRISMA flow diagram

Source: Authors' own creation

2.2 Data extraction and analysis

We extracted relevant data from the 81 selected articles regarding publication year, journals, theoretical framework, research method, country of study, sample characteristics and key drivers and barriers. Afterward, we performed three analysis techniques, as follows:

(1) descriptive quantitative analysis to highlight the current research profile;

(2) thematic content analysis to synthesize existing literature on the drivers and barriers; and

(3) critical analysis of existing literature to suggest a future agenda.

3. Results

3.1 Descriptive analysis (answering RQ1)

Figure 2 below presents the journal-wise publication frequency of the selected articles. Most of the research studies on consumer adoption (or resistance) of AI services in the hospitality sector are published in the *International Journal of Contemporary Hospitality Management* ($n = 15$) and the *International Journal of Hospitality Management* ($n = 10$). Regarding the

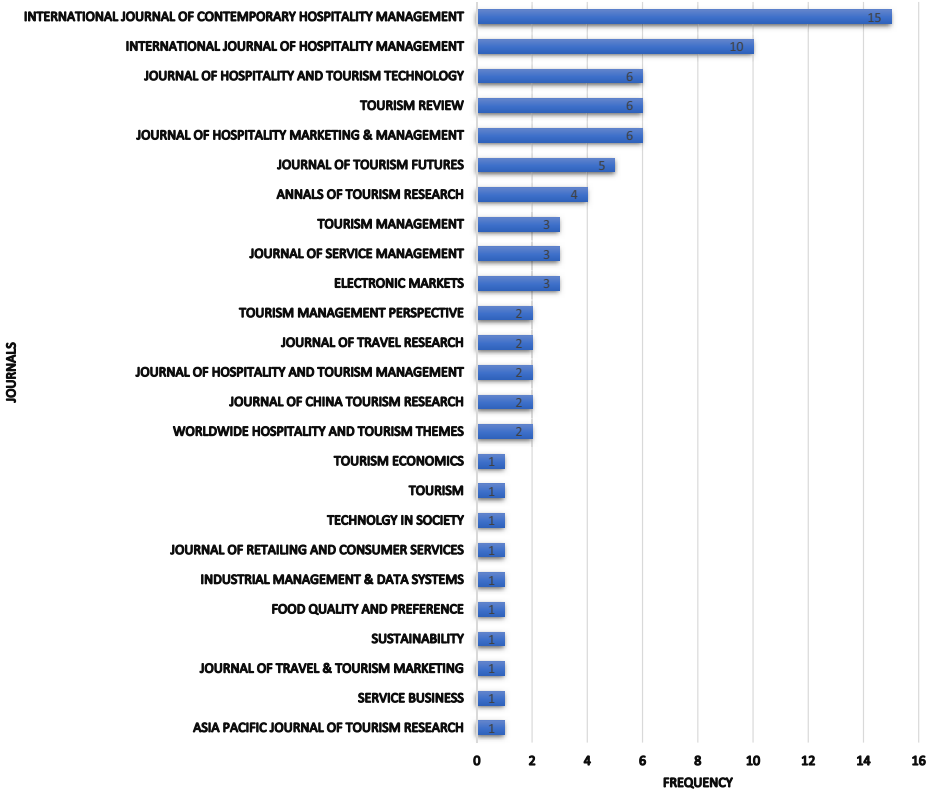

Figure 2.
Journals selected in this review

Source: Authors' own creation

type and methodological aspects, 53 articles are empirical, and 28 are nonempirical (Figure 3). Moreover, Figure 4 highlights that scholars have mostly used quantitative methods ($n = 43$), followed by conceptual and LRs ($n = 28$), mix-methods ($n = 6$) and qualitative methods ($n = 4$). Finally, Figure 5, regarding the geographical contexts, highlights the dominance of China ($n = 17$) and the USA ($n = 13$).

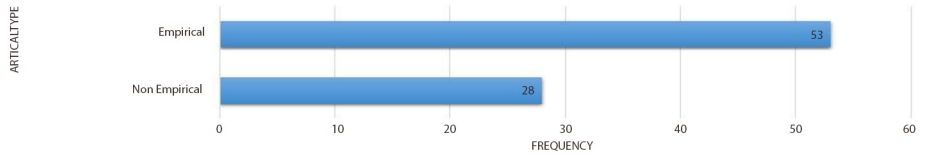

Figure 3.
Empirical and non-empirical articles

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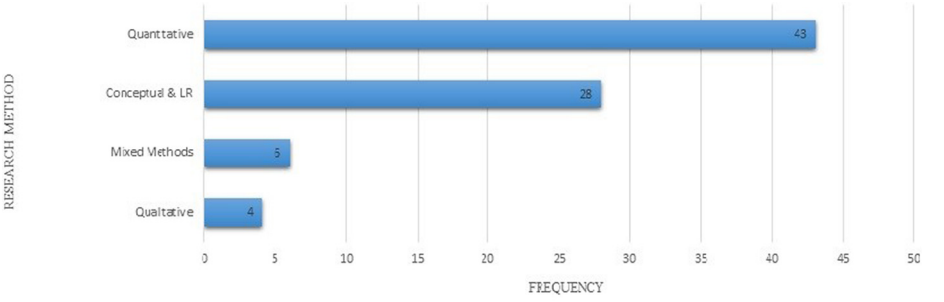

Figure 4.
Research methods

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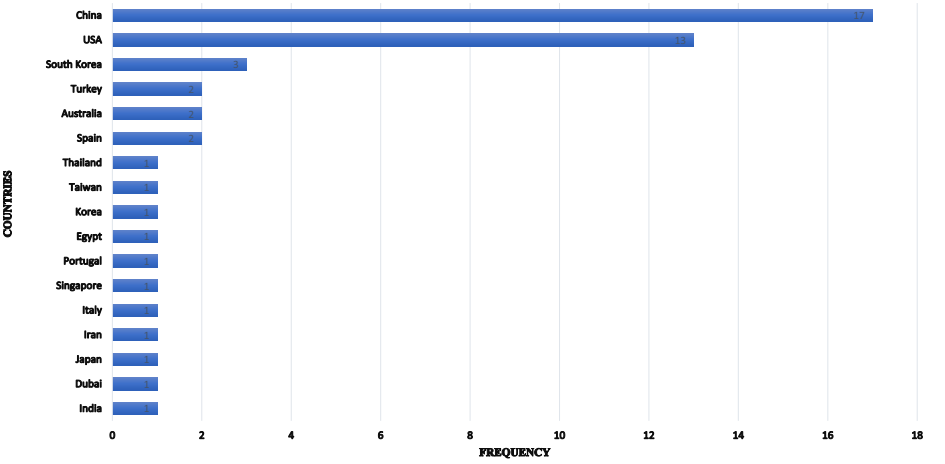

Figure 5.
Geographical contexts in empirical studies

Source: Authors' own creation

3.2 Thematic content analysis (answering RQ2 and RQ3)

The studies included in this review (n = 81) investigated various factors affecting consumers' adoption of AI in the hospitality sector. In consonance with the recent SLR studies, we performed a thematic content analysis to present an unbiased synthesis of existing literature (Tranfield *et al.*, 2003). After careful review and analysis, we discuss our findings into three main categories as follows: theoretical underpinnings, drivers and barriers.

3.2.1 Theories. Previous studies have predominantly used behavioral theories, including TAM, TPB and the unified theory of acceptance and use of technology. Originated from a TRA, TPB predicts an individual's intention to engage in a specific behavior. The TAM is one of the widely recognized models related to technology acceptance. Two main factors influence a person's intention to use new technologies (i.e. usefulness and ease of use). Other theories used in previous studies are listed in Figure 6 below.

3.2.2 Drivers of consumer adoption of artificial intelligence services in hospitality. Based on our review and analysis, we categorized the driving factors into four subthemes: functional, social, personal/emotional and contextual drivers (Figure 7).

3.2.2.1 Functional drivers. Functional drivers refer to the benefits obtained from the valuable features of the core product or service (Sheth *et al.*, 1991). To this end, previous studies have largely examined how AI technology's valuable features and functioning (e.g. robotics) influence consumers' intention to use these services. Perceived usefulness (PU) and perceived ease of use (PEU) of AI or robots are the two main functional drivers found to be the significant underpinning factors shaping consumers' attitudes and intentions (Park *et al.*, 2021; Zhong *et al.*, 2020a, 2020b). PU and PEU of AI technology significantly influence its perceived value (de Kervenoael *et al.*, 2020) and predict the adoption intention (Pillai and Sivathanu, 2020). Moreover, perceived interactivity (Go *et al.*, 2020), and innovativeness (Cha, 2020; Kim *et al.*, 2020) of the AI technology utilization in the hospitality sector positively affect consumers' adoption and their repurchase intention.

3.2.2.2 Social drivers. The findings of our review highlighted various social drivers of consumer adoption of AI in the hospitality sector (Sheth *et al.*, 1991). For instance, consumers' willingness to use AI or robots in hotels is often linked to social influences (Lu *et al.*, 2019). In addition, previous studies have highlighted the importance of social groups and networks in enabling and influencing consumers' perceptions of the perceived costs and advantages of using AI devices (Lin *et al.*, 2020; Roy *et al.*, 2020). Empirical evidence also

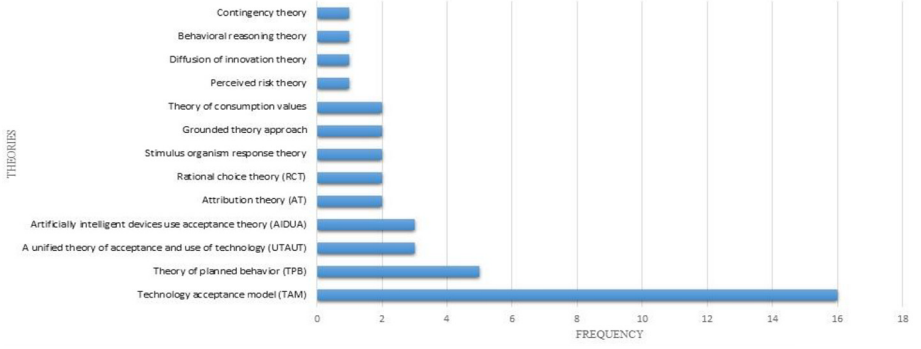

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Figure 6.
Theories used in previous research

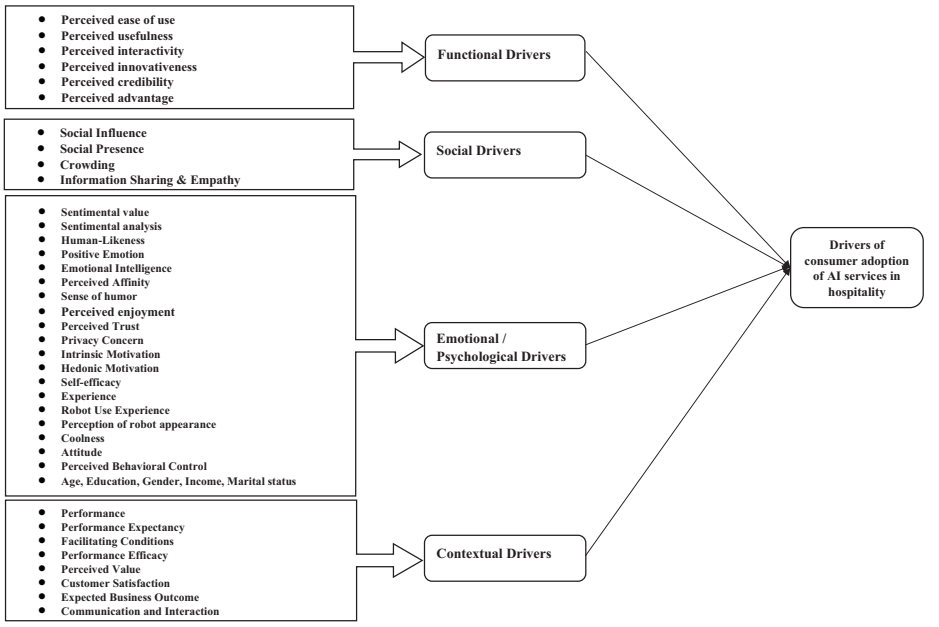

Figure 7.
Thematic foci of drivers

Source: Authors own creation

suggests the significant influences of crowding (Hou *et al.*, 2021), information sharing and empathy on consumers' willingness to use AI and robotic services.

3.2.2.3 Emotional/psychological drivers. Our review also suggested that most previous studies have investigated the role of consumers' psychological factors (e.g. emotional, motivational and personal) in driving their use of AI services in hospitality. Psychological drivers reflect the extent to which AI services evoke consumer sentiments (positive or negative), willingness and motivation to adopt AI services (Sheth *et al.*, 1991). Our review of the existing literature highlighted the significance of the following:

- emotional (e.g. positive sentiments, emotional intelligence and human likeness);
- motivational (e.g. hedonic and intrinsic); and
- personal factors (e.g. age, gender, education, income and marital status).

Previous studies have reported that positive emotions and intrinsic motivations increased the willingness to use AI and decreased consumer hesitation (Lin *et al.*, 2020; Roy *et al.*, 2020). In this line of research, Zhong *et al.* (2020a, 2020b) reported that sentimental value and perceived value significantly influence behavioral intentions. Moreover, human likeness positively affects affinity, which positively influences service improvement attribution leading to consumer behavioral intentions (Belanche *et al.*, 2020).

3.2.2.4 Contextual/situational drivers. In addition to the functional, social and psychological drivers, the influence of the contexts the consumer encounters with AI and robots also exists. Previous studies have reported the impacts of facilitating conditions, performance efficacy and performance expectancy to drive consumers' attitudes and behavioral intentions (Lin *et al.*, 2020; Roy *et al.*, 2020).

3.2.3 Barriers impeding consumer adoption of artificial intelligence services in hospitality. Compared to the previous research on the drivers of AI adoption, limited attention was given to the factors impeding the use of AI services. We categorize these barriers into the following subthemes: usage, value and risks (Figure 8).

3.2.3.1 Usage barriers. The usage barriers reflect the incompatibility of the products or services with the consumers' earlier experiences, habits, workflow and acceptance standards (Ram and Sheth, 1989). The complexity of using AI services, perceived disadvantages and technological anxiety are the major impeding factors in existing research. However, contrary to viewing technological anxiety as an impeding factor, few studies have reported no significant relationship between technological anxiety and AI adoption intention (Pillai and Sivathanu, 2020).

3.2.3.2 Value barriers. The findings of our review suggest that when a customer perceives no or a lesser value of a new product or service than an existing alternative's value, this is referred to as a value barrier (Laukkanen *et al.*, 2008). Effort expectancy was negatively linked to emotions. It negatively impacts willingness to use AI devices and positively affects objection to use (Lin *et al.*, 2020; Roy *et al.*, 2020). Moreover, every new invention or product is often perceived with regard to the characters from its country of origin or products and brand category (Ram and Sheth, 1989). These adverse connections may result in an image barrier (Laukkanen *et al.*, 2008). Anthropomorphism was discovered to have a strong positive impact on effort expectancy. Still, effort expectancy was negatively and significantly correlated to emotion, whereas emotions were negatively connected with an objection to using AI devices among consumers (Lin *et al.*, 2020; Roy *et al.*, 2020).

3.2.3.3 Risk barriers. A risk barrier is a new service or product's degree of uncertainty and risks (Ram and Sheth, 1989), which is determined by the consumer's perception or experience with new product innovation (Chen and Kuo, 2017). With regard to the global health issue of the COVID-19 epidemic, the findings of existing research on the consumers' interaction preferences for human-staffed hotels versus robot-staffed hotels varied and reported inconsistent results. Because perceived threats significantly moderated customers' preference for robot-staffed hotels, the respondents' preferences were related to the global health issue (Kim *et al.*, 2021).

3.3 Knowledge gaps in the existing literature and future agenda (answering RQ4)

We have critically evaluated the extant literature to highlight knowledge gaps in the existing literature that overlay the foundation to set directions for future research. In doing so, we have specifically formulated avenues for theme-based future research in the form of

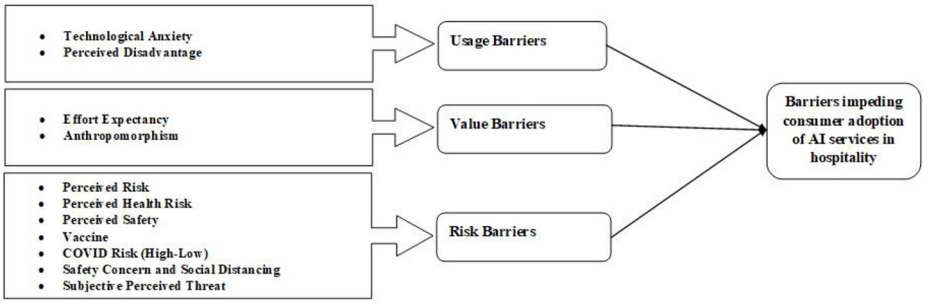

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Figure 8.
Thematic foci of barriers

research questions (see Table 3). More significantly, we have suggested future directions in theoretical advancements and the themes of the drivers of AI services adoption and the barriers to adopting AI services in hospitality. We have suggested several proposals that could pave the way for future research to meaningfully pollinate the field of consumer adoption and resistance to AI in hospitality. Moreover, we encourage future researchers to move in a unified direction so that this field would grow to generate consensual findings and implications.

4. Framework development – literature synthesis and behavioral reasoning perspective

The findings of our review highlighted the intellectual structure, key theories, drivers, and barriers to consumer adoption of AI services in hospitality. Figure 9 presents a synthesized framework of our review findings. The synthesized framework includes four main components, as follows:

- theoretical perspectives;
- drivers of AI adoption;
- barriers to AI adoption; and
- personal/psychological characteristics.

Concerning theoretical underpinnings in existing research, our review has highlighted the dominance of three behavioral frameworks: TBP, TRA and TAM. At the same time, these theories have been criticized because of their limited potential to predict generalized consumer behavior, and they ignore the context-specific reasons in behavioral decision-making (Garcia *et al.*, 2007; Gilal *et al.*, 2019). To this end, our understanding of the reasons for accepting or rejecting new technologies is limited. However, there is a dire need to use other theoretical lenses for further advancements in this field. We call for future research to extend scholarly and practical debate through the lens of behavioral reasoning theory (BRT) (Westaby, 2005). BRT is based on four components value, reasons (for and against), attitude and intention/behavior. BRT is a unique approach to understanding innovation adoption in which both reasons for adoption and reasons against adoption are explored in a holistic framework. Figure 10 below presents the theoretical framework to extend the scholarly debate on this topic.

5. Discussions and conclusion

5.1 Conclusion

This study presents a state-of-the-art literature review of AI adoption (or resistance) in the hospitality sector. By using the SLR technique, this study identified, reviewed and synthesized the findings of 81 studies. After highlighting the quantitative research profile of existing literature, the thematic content analysis technique categorized extant research into two key themes: the drivers (i.e. functional, social, personal/emotional and contextual) and barriers (value, usage, barriers and risks). Moreover, the findings of this review would serve as a comprehensive guide for further knowledge development based on the suggested future research trajectories. A key takeaway is the theoretical advancements by using BRT in the context of consumer adoption of AI/robotic services in the fields of tourism and hospitality.

5.2 Theoretical implications

The findings of this review contribute to the existing literature on the drivers and barriers of AI service encounters in the hospitality sector and offer several theoretical implications.

Themes	Subthemes	Limitations in current research	Future suggestions	Future research questions
Theoretical perspectives	Behavioral theories	• Existing behavioral theories (TAM, TRA and TPB): • Ignore motives and context-specific reasons • Limited potential to predict generalized behaviors	• BRT differs from other behavioral theories, as it considers the reasons for the attractiveness of any innovation to test the BRT in other research areas such as product innovation, luxury goods and services. The future researcher should use the BRT lens to investigate consumer adoption/resistance to AI services to understand context-specific reasons	FRQ1: How can BRT be used to explore underlying reasons and motives for AI adoption? FRQ2: How would the reasons for (and against) the adoption of AI services affect the attitudes-intentions-behaviors of customers?
Drivers of AI services adoption in hospitality	Functional	• Limited understanding of the relative importance of functional drivers • Limited consideration of how functional drivers may interact with each other	• Explore the impact of AI's performance and efficiency (e.g. automation/customization), including consumer perceptions of speed, accuracy and reliability • More research is needed to explore the interplay of drivers	FRQ3: How do AI's performance and efficiency impact consumer adoption in the hospitality industry, and what factors are most important to consumers? FRQ4: What role does convenience play in shaping consumer attitudes toward AI adoption in the hospitality industry, and how can AI technology be designed to maximize convenience for consumers?
	Personal/ psychological	• Different types of consumers may be motivated by different personal/ psychological drivers, yet existing research treats all consumers as having similar motivations • Consumers' perceived control over a service may interact with the perceived trustworthiness of the service providers	• Explore the impact of cognitive factors, such as perceived complexity and cognitive load • More research is required to examine consumer types and see differences in personal/psychological drivers • Explore the role of perceived control, consumer perceptions of autonomy, comfort, personalization and self-determination	FRQ5: How do emotional factors (perceived comfort and personalization) and cognitive factors (perceived complexity and cognitive load) impact consumer adoption of AI in the hospitality industry? FRQ6: How can marketers and businesses design AI technology to optimize these cognitive and emotional experiences? FRQ7: To what extent does perceived control influence consumer attitudes toward AI adoption, and how can businesses design AI technology to

(*continued*)

Table 3.
Future research agenda for the AI adoption

Table 3.

Themes	Subthemes	Limitations in current research	Future suggestions	Future research questions
				promote consumer perceptions of control and autonomy?
	Social	• Limited consideration of how social drivers may interact with other drivers • Limited understanding of how social drivers may differ across different consumer segments	• Explore the role of social influence, such as social norms and word-of-mouth recommendations • Investigate the impact of trust and credibility-related factors, such as reputation and transparency • Explore the role of social identity, such as group membership and self-concept	FRQ8: To what extent do social norms, word-of-mouth recommendations, trust and credibility-related factors influence consumer attitudes toward AI adoption? FRQ9: How can businesses build and maintain trust with consumers in the context of AI technology? FRQ10: How do social identity factors shape consumer attitudes toward AI adoption in the hospitality industry, and how can businesses effectively tailor their AI offerings to different social identity groups?
	Contextual	• Limited understanding of how contextual drivers may differ across different contexts, e.g. the consumer may be more likely to adopt an AI service in a hotel with a high degree of automation (and vice versa) • Limited consideration of how contextual drivers may interact with other drivers	• Explore the impact of AI's physical environment and facility conditions • Explore the impact of organizational culture and employee attitudes • Investigate the impact of contextual factors, such as physical environment and contextual factors (e.g. accessibility, availability and affordability)	FRQ11: How do contextual factors, the physical environment and contextual factors impact consumer adoption of AI in the hospitality industry, and what factors are most important? FRQ12: What impact do organizational factors (attitudes, organizational culture and structure) have on consumer adoption? And how can these factors be navigated to promote adoption? FRQ13: How do contextual drivers interact with other drivers and barriers to AI adoption in the hospitality industry?
Barriers to AI services adoption in hospitality	Usage	• Limited consideration of how consumers' prior experience with technology may influence their perception	• More research is needed to understand how these barriers can be overcome through effective design and user interface	FRQ14: How can businesses design AI technology that overcomes usage barriers and is intuitive and easy to use for consumers with varying levels of technical-technological expertise? FRQ15: How do usage barriers to AI

(*continued*)

Themes	Subthemes	Limitations in current research	Future suggestions	Future research questions
		• Different AI services may pose different usage barriers to consumers, yet existing research treats all AI services as having similar usage barriers	• Investigate the impact of perceptions about the usage disadvantages of AI, such as technological nervousness	adoption vary across different types of hospitality services (e.g. hotels, restaurants and theme parks), and what factors should businesses consider when designing AI technology for different hospitality services?
	Value	• Limited consideration of how consumers' perceived value may change over time • Extant research treats value perception as objective/universal; however, it can vary based on individual factors such as preferences and past experiences	• Longitudinal studies tracking consumers' perceptions of value over time are needed • More research is needed to identify/examine the value barrier of AI adoption across different consumer segments and cultural and regional contexts	FRQ16: To what extent do consumer perceptions of AI value vary over time? And across hospitality services? And how can businesses design AI technology tailored to consumers' unique needs and preferences in different service contexts? FRQ17: How do value barriers to AI adoption vary across consumer segments (e.g. business travelers, leisure travelers and families), and what factors should be considered when designing AI technology?
	Risk	• Existing research mainly treats all types of AI with similar risk perceptions. However, different AI types may pose different threats/risks to consumers • Limited consideration of consumers' prior experience with AI services	• Identify different types of risk barriers consumers face from different AI services • Identify and examine the risk barrier of AI adoption across cultural and regional contexts	FRQ18: What key barriers prevent consumers from adopting AI in the hospitality industry? And how can businesses design AI technology that minimizes potential risks (e.g. data privacy and security)? FRQ19: To what extent do risk perceptions vary across different types of AI applications in the hospitality industry (e.g. chatbots, recommendation engines and facial recognition)? FRQ20: How do risk perceptions and barriers to AI adoption vary across different cultural, industrial and and regional contexts?

Source: Authors' own creation

Table 3.

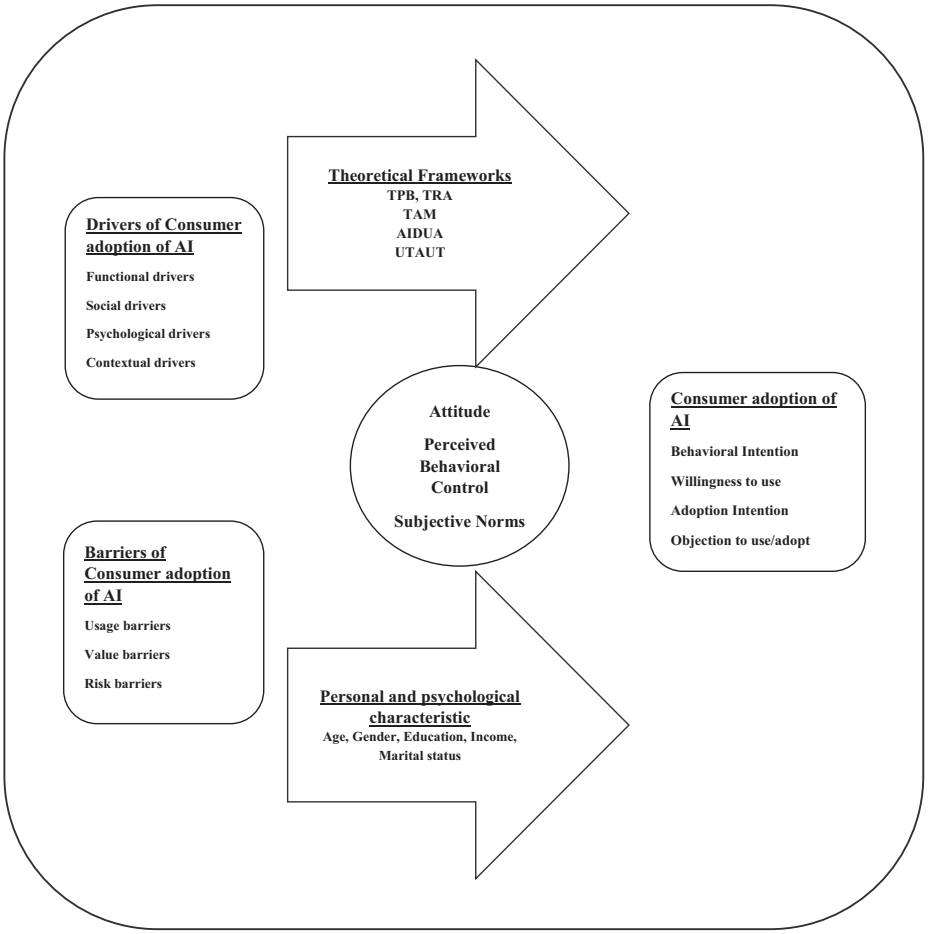

Figure 9.
Synthesized framework

Source: Authors own creation

This is the first SLR to review, evaluate and synthesize existing research on various drivers and barriers to AI services adoption in the hospitality industry context. By synthesizing the widespread literature on this topic, this review develops a comprehensive framework to provide an overall summary of existing literature and underscores the role and significance of key drivers and barriers in consumer adoption of AI services. It also reveals valuable information such as publishing outlets, timelines, geographic scope, research methods and relevant theories. Second, drawing from the lens of BRT, this review organizes the fragmented research on barriers and drivers into relevant dimensions. This assists academicians and future scholars to investigate consumer adoption (or resistance) to AI/robotic services from a new perspective (i.e. exploring context-specific reasons). Third, the present review provides a critic of the extant literature by highlighting knowledge gaps and postulating specific RQs for future researchers. The created framework allows researchers

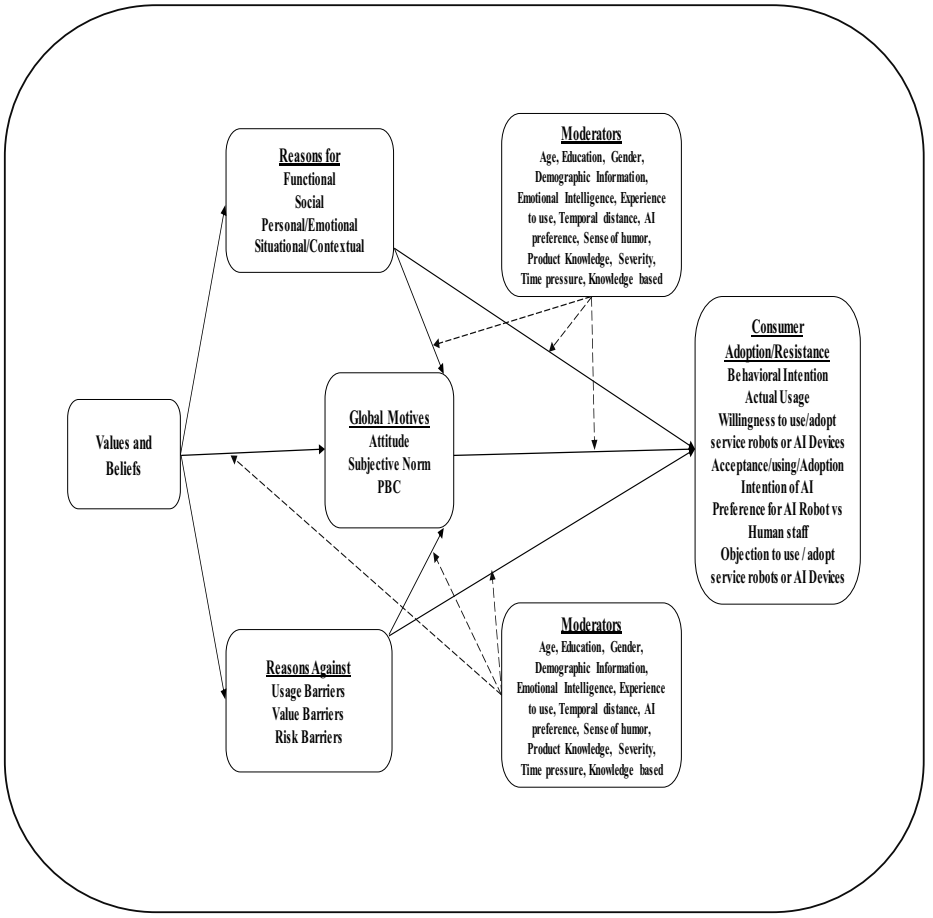

Figure 10.
BRT framework for future research

Source: Adapted from Westaby, 2005

to select and test the most critical motives affecting the Intention to use/adoption of AI services in the hotel business.

5.3 Practical implications

This study has significant practical implications for multiple stakeholders, including marketing managers, consumers, and policymakers. The findings help various stakeholders to understand the underlying causes of consumer resistance to their adoption of AI services in the hospitality sector. Marketers can leverage the identified determinants of AI adoption to tailor their messaging and positioning strategies accordingly. In particular, the hospitality industry has been seriously affected in the COVID-19 pandemic; however, the understanding of various driving and hindering factors may assist practitioners and

policymakers to develop appropriate policies for the revival of the hospitality industry. Establishing clear standards and safeguards, policymakers can promote responsible AI adoption and engender trust among consumers. Moreover, by providing a timely and updated knowledge, this study would serve as a guide for practitioners to improve AI/robotic services to attract and retain customers.

5.4 Limitations and future research

Despite significant implications for theory and practice, the readers should consider the following limitations. First, although we have developed and used a comprehensive search string, some relevant studies that used slightly different terminologies may have been left out of this review. Future researchers can use more keywords and synonymous terminology referring to AI/robotic services literature. Second, we also acknowledge that some studies might have been missed as our search criteria were restricted to the title, keywords and abstracts. Future scholars can additionally search these keywords in the full text to yield more relevant studies. Moreover, another limitation of this study is the inclusion of articles published in the English language; however, relevant studies published in other languages were not considered. In addition to these limitations of the present review, Table 3 highlights key issues and limitations in the current literature in terms of theoretical frameworks, drivers and barriers and suggests several RQs to extend scholarly debate in this field.

References

Alma Çallı, B., Çallı, L., Sarı Çallı, D. and Çallı, F. (2023), "The impact of different types of service robots usage in hotels on guests' intention to stay", *Journal of Hospitality and Tourism Technology*, Vol. 14 No. 1, pp. 53-68.

Belanche, D., Casaló, L.V. and Flavián, C. (2020), "Frontline robots in tourism and hospitality: service enhancement or cost reduction?", *Electronic Markets:*, Vol. 31 No. 3, pp. 1-16.

Bowen, J. and Morosan, C. (2018), "Beware hospitality industry: the robots are coming", *Worldwide Hospitality and Tourism Themes*, Vol. 10 No. 6.

Buhalis, D. and Moldavska, I. (2022), "Voice assistants in hospitality: using artificial intelligence for customer service", *Journal of Hospitality and Tourism Technology*, Vol. 13 No. 3, pp. 386-403.

Cain, L.N., Thomas, J.H. and Alonso, M. Jr, (2019), "From sci-fi to sci-fact: the state of robotics and AI in the hospitality industry", *Journal of Hospitality and Tourism Technology*, Vol. 10 No. 4.

Çakar, K. and Aykol, Ş. (2021), "Understanding travellers' reactions to robotic services: a multiple case study approach of robotic hotels", *Journal of Hospitality and Tourism Technology*, Vol. 12 No. 1, pp. 155-174.

Cha, S.S. (2020), "Customers' intention to use robot-serviced restaurants in Korea: relationship of coolness and MCI factors", *International Journal of Contemporary Hospitality Management*, Vol. 32 No. 9.

Chen, P.-T. and Kuo, S.-C. (2017), "Innovation resistance and strategic implications of enterprise social media websites in Taiwan through knowledge sharing perspective", *Technological Forecasting and Social Change*, Vol. 118, pp. 55-69.

Chi, O.H., Denton, G. and Gursoy, D. (2020), "Artificially intelligent device use in service delivery: a systematic review, synthesis, and research agenda", *Journal of Hospitality Marketing and Management*, Vol. 29 No. 7, pp. 757-786.

de Kervenoael, R., Hasan, R., Schwob, A. and Goh, E. (2020), "Leveraging human-robot interaction in hospitality services: incorporating the role of perceived value, empathy, and information sharing into visitors' intentions to use social robots", *Tourism Management*, Vol. 78, p. 104042.

Doborjeh, Z., Hemmington, N., Doborjeh, M. and Kasabov, N. (2021), "Artificial intelligence: a systematic review of methods and applications in hospitality and tourism", *International Journal of Contemporary Hospitality Management*, Vol. 34 No. 3.

Garcia, R., Bardhi, F. and Friedrich, C. (2007), "Overcoming consumer resistance to innovation", *MIT Sloan Management Review*, Vol. 48 No. 4, p. 82.

Gilal, F.G., Zhang, J., Paul, J. and Gilal, N.G. (2019), "The role of self-determination theory in marketing science: an integrative review and agenda for research", *European Management Journal*, Vol. 37 No. 1, pp. 29-44.

Go, H., Kang, M. and Suh, S.C. (2020), "Machine learning of robots in tourism and hospitality: interactive technology acceptance model (iTAM)–cutting edge", *Tourism Review*, Vol. 75 No. 4.

Goel, P., Kaushik, N., Sivathanu, B., Pillai, R. and Vikas, J. (2022), "Consumers' adoption of artificial intelligence and robotics in hospitality and tourism sector: literature review and future research agenda", *Tourism Review*, Vol. 77 No. 4.

Goodell, J.W., Kumar, S., Lim, W.M. and Pattnaik, D. (2021), "Artificial intelligence and machine learning in finance: identifying foundations, themes, and research clusters from bibliometric analysis", *Journal of Behavioral and Experimental Finance*, Vol. 32, p. 100577.

Gupta, D.G., Shin, H. and Jain, V. (2022), "Luxury experience and consumer behavior: a literature review", *Marketing Intelligence and Planning*, Vol. 41 No. 2.

Hou, Y., Zhang, K. and Li, G. (2021), "Service robots or human staff: how social crowding shapes tourist preferences", *Tourism Management*, Vol. 83, p. 104242.

Ivanov, S., Webster, C. and Seyyedi, P. (2018), "Consumers' attitudes towards the introduction of robots in accommodation establishments", *Tourism: An International Interdisciplinary Journal*, Vol. 66 No. 3, pp. 302-317.

Ivanov, S., Gretzel, U., Berezina, K., Sigala, M. and Webster, C. (2019), "Progress on robotics in hospitality and tourism: a review of the literature", *Journal of Hospitality and Tourism Technology*.

Jiang, Y. and Wen, J. (2020), "Effects of COVID-19 on hotel marketing and management: a perspective article", *International Journal of Contemporary Hospitality Management*, Vol. 32 No. 8.

Khizar, H.M.U., Iqbal, M.J., Khalid, J. and Adomako, S. (2022), "Addressing the conceptualization and measurement challenges of sustainability orientation: a systematic review and research agenda", *Journal of Business Research*, Vol. 142, pp. 718-743.

Kim, J.J., Choe, J.Y.J. and Hwang, J. (2020), "Application of consumer innovativeness to the context of robotic restaurants", *International Journal of Contemporary Hospitality Management*, Vol. 33 No. 1.

Kim, S.S., Kim, J., Badu-Baiden, F., Giroux, M. and Choi, Y. (2021), "Preference for robot service or human service in hotels? Impacts of the COVID-19 pandemic", *International Journal of Hospitality Management*, Vol. 93, p. 102795.

Kong, H., Yuan, Y., Baruch, Y., Bu, N., Jiang, X. and Wang, K. (2021), "Influences of artificial intelligence (AI) awareness on career competency and job burnout", *International Journal of Contemporary Hospitality Management*, Vol. 33 No. 2.

Kumar, S., Sharma, D., Rao, S., Lim, W.M. and Mangla, S.K. (2022), "Past, present, and future of sustainable finance: insights from big data analytics through machine learning of scholarly research", *Annals of Operations Research*, pp. 1-44.

Laukkanen, P., Sinkkonen, S. and Laukkanen, T. (2008), "Consumer resistance to internet banking: postponers, opponents and rejectors", *International Journal of Bank Marketing*, Vol. 26 No. 6.

Li, M., Yin, D., Qiu, H. and Bai, B. (2021), "A systematic review of AI technology-based service encounters: implications for hospitality and tourism operations", *International Journal of Hospitality Management*, Vol. 95, p. 102930.

Lin, H., Chi, O.H. and Gursoy, D. (2020), "Antecedents of customers' acceptance of artificially intelligent robotic device use in hospitality services", *Journal of Hospitality Marketing and Management*, Vol. 29 No. 5, pp. 530-549.

Lu, L., Cai, R. and Gursoy, D. (2019), "Developing and validating a service robot integration willingness scale", *International Journal of Hospitality Management*, Vol. 80, pp. 36-51.

Mingotto, E., Montaguti, F. and Tamma, M. (2020), "Challenges in re-designing operations and jobs to embody AI and robotics in services. Findings from a case in the hospitality industry", *Electronic Markets*, Vol. 31 No. 3, pp. 1-18.

Mukherjee, D., Lim, W.M., Kumar, S. and Donthu, N. (2022), "Guidelines for advancing theory and practice through bibliometric research", *Journal of Business Research*, Vol. 148, pp. 101-115.

Özen, İA. and Özgül Katlav, E. (2023), "Aspect-based sentiment analysis on online customer reviews: a case study of technology-supported hotels", *Journal of Hospitality and Tourism Technology*, Vol. 14 No. 2, pp. 102-120.

Park, S.S., Tung, C.D. and Lee, H. (2021), "The adoption of AI service robots: a comparison between credence and experience service settings", *Psychology and Marketing*, Vol. 38 No. 4, pp. 691-703.

Parvez, M.O. (2020), "Use of machine learning technology for tourist and organizational services: high-tech innovation in the hospitality industry", *Journal of Tourism Futures*, Vol. 7 No. 2.

Pillai, R. and Sivathanu, B. (2020), "Adoption of AI-based chatbots for hospitality and tourism", *International Journal of Contemporary Hospitality Management*, Vol. 32 No. 10.

Ram, S. and Sheth, J.N. (1989), "Consumer resistance to innovations: the marketing problem and its solutions", *Journal of Consumer Marketing*, Vol. 6 No. 2.

Rasheed, H.M.W., He, Y., Khizar, H.M.U. and Abbas, H.S.M. (2023), "Exploring consumer-robot interaction in the hospitality sector: unpacking the reasons for adoption (or resistance) to artificial intelligence", *Technological Forecasting and Social Change*, Vol. 192, p. 122555.

Reis, J., Amorim, M., Cohen, Y. and Rodrigues, M. (2020), "Artificial intelligence in service delivery systems: a systematic literature review", *In World Conference on Information Systems and Technologies*, pp. 222-233.

Roy, P., Ramaprasad, B.S., Chakraborty, M., Prabhu, N. and Rao, S. (2020), "Customer acceptance of use of artificial intelligence in hospitality services: an Indian hospitality sector perspective", *Global Business Review*, p. 0972150920939753.

Ruel, H. and Njoku, E. (2020), "AI redefining the hospitality industry", *Journal of Tourism Futures*, Vol. 7 No. 1.

Samara, D., Magnisalis, I. and Peristeras, V. (2020), "Artificial intelligence and big data in tourism: a systematic literature review", *Journal of Hospitality and Tourism Technology*, Vol. 11 No. 2, pp. 343-367.

Sheth, J.N., Newman, B.I. and Gross, B.L. (1991), "Why we buy what we buy: a theory of consumption values", *Journal of Business Research*, Vol. 22 No. 2, pp. 159-170.

Shin, H. (2022), "A critical review of robot research and future research opportunities: adopting a service ecosystem perspective", *International Journal of Contemporary Hospitality Management*, Vol. 34 No. 6.

Tranfield, D., Denyer, D. and Smart, P. (2003), "Towards a methodology for developing evidence-informed management knowledge by means of systematic review", *British Journal of Management*, Vol. 14 No. 3, pp. 207-222.

Webster, C. and Ivanov, S. (2020), "Demographic change as a driver for tourism automation", *Journal of Tourism Futures*, Vol. 6 No. 3.

Westaby, J.D. (2005), "Behavioral reasoning theory: identifying new linkages underlying intentions and behavior", *Organizational Behavior and Human Decision Processes*, Vol. 98 No. 2, pp. 97-120.

Wong, I.A., Chau, K.F. and Chan, H.U. (2023), "An empirical study on customers' gambling intention in AI-supported casinos", *Journal of Hospitality and Tourism Technology*, Vol. 14 No. 2, pp. 121-136.

Wu, L., Fan, A., Yang, Y. and He, Z. (2021), "Robotic involvement in the service encounter: a value-centric experience framework and empirical validation", *Journal of Service Management*, Vol. 32 No. 5.

Zhong, L., Sun, S., Law, R. and Zhang, X. (2020a), "Impact of robot hotel service on consumers' purchase intention: a control experiment", *Asia Pacific Journal of Tourism Research*, Vol. 25 No. 7, pp. 780-798.

Zhong, L., Zhang, X., Rong, J., Chan, H.K., Xiao, J. and Kong, H. (2020b), *Construction and Empirical Research on Acceptance Model of Service Robots Applied in Hotel Industry*, Industrial Management Data Systems.

Zhu, Y., Zhang, R.R., Zou, Y. and Jin, D. (2023), "Investigating customers' responses to artificial intelligence chatbots in online travel agencies: the moderating role of product familiarity", *Journal of Hospitality and Tourism Technology*, Vol. 14 No. 2, pp. 208-224.

Further reading

Choi, Y., Choi, M., Oh, M. and Kim, S. (. (2020), "Service robots in hotels: understanding the service quality perceptions of human-robot interaction", *Journal of Hospitality Marketing and Management*, Vol. 29 No. 6, pp. 613-635.

Nam, K., Dutt, C.S., Chathoth, P., Daghfous, A. and Khan, M.S. (2020), "The adoption of artificial intelligence and robotics in the hotel industry: prospects and challenges", *Electronic Markets:*, Vol. 31 No. 3, pp. 1-22.

Tavitiyaman, P., Zhang, X. and Tsang, W.Y. (2020), "How tourists perceive the usefulness of technology adoption in hotels: interaction effect of past experience and education level", *Journal of China Tourism Research:*, Vol. 18 No. 1, pp. 1-24.

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