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INVESTIGATING THE IMPACT OF ONLINE REVIEWS, VIRTUAL REALITY, AND AI CHATBOTS ON FIRST-TIME HOTEL BOOKINGS IN RURAL DESTINATIONS: THE ROLE OF SENSE OF PRESENCE AND TRUST

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Abstract: This study investigates how modern technologies, specifically online reviews, virtual reality (VR), and AI-powered chatbots, influence tourists' intentions to book rural accommodations and their willingness to pay a deposit in Vietnam, where over 60% of the population resides in rural areas. Despite growing interest in rural tourism, destinations often face challenges related to low digital engagement, information asymmetry, and limited trust from potential visitors. Addressing these barriers, the study applies the Stimulus-Organism-Response (SOR) theoretical framework to examine how these technologies act as external stimuli that enhance internal psychological states, namely tourists' sense of presence and trust, which in turn drive behavioral outcomes. A quantitative survey was conducted with 425 first-time Vietnamese tourists who had considered rural tourism in their future destinations. Using SPSS and AMOS for data analysis, the study tested a structural model to investigate individual technology use in booking behaviors. The findings confirm that sense of presence and trust significantly mediate the relationship between technological stimuli and tourists' behavioral intentions. Online reviews emerged as the strongest driver of trust, underlining the importance of user-generated content in reducing perceived risk. VR technology was found to be particularly effective in generating a strong sense of presence, allowing tourists to visualize and emotionally connect with rural destinations before visiting. AI chatbots supported both presence and trust by offering real-time assistance, personalized information, and interactive engagement, enhancing users' overall experience. The study contributes to tourism literature by validating the SOR model in a rural context and demonstrating the differentiated effects of digital tools on psychological and behavioral responses. From a managerial perspective, the findings provide actionable insights for rural accommodation providers and tourism marketers. Strategic implementation of immersive and interactive technologies can not only increase tourists' trust and emotional engagement but also improve reservation rates and revenue predictability through deposit commitments. For emerging economies like Vietnam, embracing digital transformation in rural tourism offers a viable pathway to enhance destination appeal, attract first-time visitors, and foster sustainable tourism development.

Keywords: online review, virtual reality, AI chatbots, first-time travelers, rural destination, sense of presence, trust, willingness to pay a deposit

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INTRODUCTION

Tourism is a vital sector in the global economy, contributing nearly 10% of the world's GDP and ranking as the third largest export industry, following only fuels and chemicals (Rasoolet al., 2021). It plays a pivotal role in national development by generating employment, enhancing living standards, increasing foreign exchange reserves, and fostering broader socio-economic growth (Thommandru et al., 2023). The World Tourism Day 2015 campaign, themed "One Billion Tourists, One Billion Opportunities," underscored the transformative potential of tourism for countries at all stages of development (Rasoolet al., 2021). In recent years, developing countries have emerged as active participants in the global tourism market, as governments increasingly recognize the sector's developmental benefits. Consequently, there has been continuous expansion across various tourism forms, including luxury, heritage, urban, and rural tourism (Bazargani & Kiliç, 2021).

Rural tourism represents a niche segment that has been gaining increasing attention in recent years, primarily due to its appeal among tourists seeking authentic and immersive experiences (Rosalina et al., 2021). It has also emerged as a strategic tool within national development agendas, particularly in revitalizing rural economies through the promotion of localized tourism activities (Chen et al., 2023). Despite its growing relevance, the definition of rural tourism remains a subject of scholarly debate, largely due to differing criteria used to classify rural areas (Nair et al., 2015). According to the World Tourism Organization (WTO), rural tourism is characterized by personalized interactions and engagement with the physical and cultural landscapes of the countryside, allowing travelers to participate in local traditions, activities, and lifestyles (Aref & Gill, 2009). However, the development of rural tourism remains limited and inconsistent, hindered by underdeveloped infrastructure and supporting services such as transportation, food and beverage offerings, accommodations, and tourist attractions, particularly for first-time travelers. Tourists often hesitate to book hotels at rural

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destinations due to perceptions of poor service quality, lack of professionalism, and concerns about service reliability. Therefore, there is a pressing need for research that explores strategies to enhance tourists' booking intentions and willingness to commit financially to rural travel, thereby supporting the sustainable growth of the tourism sector in these areas.

Recent advancements in innovative technologies have significantly transformed the tourism and hospitality industries by enhancing the overall consumer experience (Zhong et al., 2024; Ahmad et al., 2025). The integration of state-of-the-art technologies is not only empowering tourists in their decision-making processes but also creating new opportunities for rural destinations to position themselves as attractive tourism markets. Technologies such as online reviews, virtual reality (VR), and AI-powered chatbots have been increasingly adopted by tourism operators to foster psychological engagement and influence tourist behavior (Wang, 2022; Salem et al., 2024). Online reviews offer credible and user-generated evaluations from past travelers, VR provides immersive simulations that allow users to virtually experience a destination, and AI chatbots facilitate continuous and responsive interactions with potential tourists. These tools contribute to enhanced tourist experiences by increasing trust, engagement, and satisfaction, particularly in hotel selection and booking processes. However, their effectiveness in the context of rural hotels remains underexplored, especially given the slower pace of technological adoption in these areas (Li, 2025). Moreover, the influence of such technologies on first-time travelers' booking intentions and willingness to make financial commitments, such as deposits, remains unclear, particularly when tourists face information gaps in evaluating rural destinations (Xie & He, 2022).

Tourism is often referred to as a "smokeless industry" and is considered a priority sector for economic development in Vietnam. Contributing approximately 6.5% to the national GDP, the country possesses significant potential to diversify and expand its tourism offerings (Statista, 2025). In alignment with this vision, Decision No. 147/QĐ-TTg approved by the Prime Minister as part of the Vietnam Tourism Development Strategy to 2030, has encouraged localities to implement initiatives that promote rural tourism in conjunction with the national rural development program (Trang, 2022). Despite the fact that over 60% of Vietnam's population resides in rural areas and numerous policy-driven efforts have been introduced, the development of rural tourism has not met expectations (Nhandan, 2023). A systematic review of the literature identifies key challenges hindering progress, including inadequate social and technical infrastructure and limited tourist engagement (Rosalina et al., 2021). As contemporary tourists become increasingly information-driven and experience-oriented, the integration of digital technologies offers promising opportunities to transform rural tourism (Lapuz, 2023). However, limited research exists on the impact of such technologies on tourist behavior in rural Vietnam, especially among first-time travelers who often lack prior experience and reliable information to support decision-making (Van Tran et al., 2023). Furthermore, it remains unclear whether the use of multiple modern technologies in combination exerts a complementary effect or leads to trade-offs in shaping tourists' booking behaviors (Quang et al., 2024). These research gaps underscore the need for empirical studies that can guide hoteliers in making informed investments in innovative technologies, particularly in rural areas where informational asymmetries often persist.

Building on the aforementioned context, this study aims to: (1) investigate the influence of modern technologies on tourists' perceived sense of presence, trust, booking intention, and willingness to place a deposit at hotels in rural areas of Vietnam; and (2) examine the specific impacts of online reviews, virtual reality, and AI chatbots on the behavioral intentions of Vietnamese first-time travelers to rural destinations. Accordingly, the study addresses the following research questions: (1) How do modern technologies shape tourists' perceptions and behavioral intentions toward hotels in rural Vietnam? and (2) In what ways do online reviews, virtual reality, and AI chatbots enhance the booking intention and deposit willingness of Vietnamese first-time travelers to rural destinations? The findings are expected to contribute both theoretically and practically advancing academic understanding of rural tourism in the digital age while providing valuable insights for policymakers and tourism businesses seeking to foster growth in Vietnam's rural hospitality sector.

LITERATURE REVIEW

1. Rural tourism in Vietnam

Rural tourism has evolved over time, with its roots traceable to case studies from the nineteenth century and continuing its development into the present day (Gao & Wu, 2017). Initially, rural tourism was broadly defined as tourism activities that occur in rural areas (Lane, 1994). In essence, it encompasses tourist experiences in countryside or non-urban settings, where visitors engage with rural life, landscapes, and local cultures. Rural tourism is distinguished by several appealing characteristics, including natural scenery, low tourist density, minimal pollution, affordability, and opportunities for direct interaction with local communities. However, due to the diverse criteria used to define "rural" and the heterogeneity of rural environments across countries, the definition of rural tourism remains a subject of scholarly debate and lacks universal consensus. To address this, Nair et al. (2015) proposed a more comprehensive definition that captures the true essence and purpose of rural tourism: *"Rural tourism is functionally rural and provides the opportunity for tourists to directly involve, experience, enjoy, and learn the unique cultural, natural, and historical attractions and activities provided by the local communities in rural areas, with cooperation from the government and businesses in order to provide socio-economic benefits without exploiting the environment."*

This definition highlights the importance of sustainability in rural tourism development, aligning it with broader trends in the tourism industry that emphasize sustainable practices (Hu et al., 2021). Thus, when we refer to rural tourism today, it is often within the framework of sustainable rural tourism. Scholars argue that the adoption of modern technologies is essential to fully realize the potential of rural tourism and ensure its sustainability (Kumar & Shekhar, 2020). Emerging technologies, such as big data and artificial intelligence (AI), not only provide reliable information to assist tourist decision-making but also enable businesses to craft effective marketing strategies that can drive tourist interest and visitation (Xie & He, 2022).

Rural tourism has been formally recognized in Malaysia as a strategic national development initiative under the Malaysia Plan, aimed at enhancing rural livelihoods and promoting economic diversification in local communities (Chin et al., 2018). The program has proven successful, with rural tourism contributing significantly to the country's GDP (Nair et al., 2015). Vietnam shares many similarities with Malaysia in terms of economic structure and geographic features, positioning it favorably for rural tourism development. With over 60% of the population residing in rural areas, along with its rich natural landscapes, diverse regional cultures, and deeply rooted traditions, Vietnam holds substantial competitive advantages in this sector (Long & Nguyen, 2018). Rural tourism is a national priority in Vietnam, as reflected in Decision No. 147/QĐ-TTg, which outlines the Prime Minister's approval of the Vietnam Tourism Development Strategy to 2030. The ongoing digital transformation of the tourism industry has further enhanced service quality, improved tourist experiences, and encouraged visitation. Significant investments have been made in upgrading technical infrastructure and digital connectivity to support the national digital transformation agenda aligned with the Fourth Industrial Revolution. Notably, in the 2024 United Nations E-Government Development Index (EGDI), Vietnam climbed 15 positions to rank 71st out of 193 countries, marking its first inclusion in the "Very High" EGDI group (Vietnamnet, 2024). These developments indicate that the adoption of digital technologies in rural tourism is both timely and essential for unlocking its full potential (Dinh et al., 2023).

2. Theoretical background

2.1. Booking intention

The intention is understood as the willingness stored in the human brain and will result in an actual action at an appropriate time (Ajzen, 2015). Intention is also described as a motivation that drives behavior. Thus, the stronger the intention, the higher the probability that the motivation will lead to an action. However, the relationship is also subjected to other factors and time takes place between intention and behavior (Cha, 2020). Regardless of the extent of variation, scholars confirm that intention is a powerful and reliable predictor of actual behavior, thereby, still gaining high interest in consumer behaviors (Wang & Li, 2022). In this study, it is referred to the probability that a tourist would like to book at a certain hotel (Tussyadiah et al., 2018).

2.2. Willingness to pay a deposit

Willingness to pay a deposit is understood as the readiness that consumers will accept to pay a deposit in order to secure a reservation (Yoon et al., 2021; Winarko et al., 2024). The concept of willingness to pay a deposit is slightly different from the concept of willingness to pay even though they both share the readiness of a consumer the former refers to the willingness of the consumer to think that they will pay a ratio amount of the total receipt while the later refers to the willingness consumer thinks that they will pay for the total receipt (Noh et al., 2024). In the context of hotel booking, willingness to pay a deposit refers to the assumption the tourist has in the pre-purchase stage while the willingness to pay refers to the assumption the tourist has after the service is delivered. Kim et al. (2017) found that tourists were willing to pay a deposit at hotels and they gained higher trust when searching for information.

2.3. Trust

Trust is referred to as a human psychological feeling that reflects the positive belief that risks are not concerns (Nuttavuthisit & Thøgersen, 2017). Trust can be understood as an expectation that a person has toward an object based on positive beliefs and previous experiences (D'Souza et al., 2021). Trust requires time to build and accumulates through time through various contacts. Trust will lead to stronger emotional reactions and positive behaviors from a consumer (Wang et al., 2014; Zhang et al., 2019). In this study, trust describes the extent of a tourist's confidence in a certain hotel. Higher trust in a hotel means tourists feel more secure toward that hotel and will increase their intention to advocate for that hotel (Lata & Kumar, 2021).

2.4. Sense of presence

Sense of presence refers to the psychological state in which individuals become so absorbed in a mediated environment that they feel as though they are located somewhere other than their physical surroundings (Tussyadiah et al., 2017). This is a subjective feeling, a product of the mind, and simply describes the feeling of being there different from the actual environment (Beck et al., 2019). Kim & Biocca (1997) conceptualize presence as comprising two dimensions: (1) arrival, referring to the sensation of being situated within a mediated environment, and (2) departure, referring to the sense of detachment from the physical environment (Bogicevic et al., 2019). Latest technologies provoke imagination, and thus likely lead to the sense of presence in an alternative virtual environment (McLean & Barhorst, 2022).

The more innovative technologies together with modern devices allow tourists to feel a sense of presence in a hotel or a resort and consequently generate positive intentions and willingness in their booking (Slevitch et al., 2022).

2.5. Online reviews

Online reviews are understood as information generated by users about their experiences, attitudes, and opinions (Ahn & Lee, 2024). The widespread of social media and mobile networks makes online reviews become easier and more available. This form of communication facilitates discussion and interaction among users who generate, share, and evaluate information prior to the purchase of a product or service in an online setting (Ventre & Kolbe, 2020). Online review is an important source for consumer decision-making during their purchasing of products and services (Park & Lee, 2009). Zhao et al. (2020) indicated that online reviews become a key information source for tourists to book hotels, particularly with booking hotels that tourists have not experienced before. Given the fact that tourists are concerned about the credibility of online reviews when manipulations have been found and recognized, it is regarded as more reliable as they are coming from real tourists with actual experiences (Saha & Biswas, 2025). Online reviews about a hotel can be seen on various

online platforms such as the hotel website and fanpage, online travel agents, or community groups on social media. Regardless of its extent, online reviews will influence tourists' evaluations and intentions, and thereby hoteliers should manage their online reviews to actively respond to issues raised by tourists (Shukla & Mishra, 2023).

2.6. Virtual reality

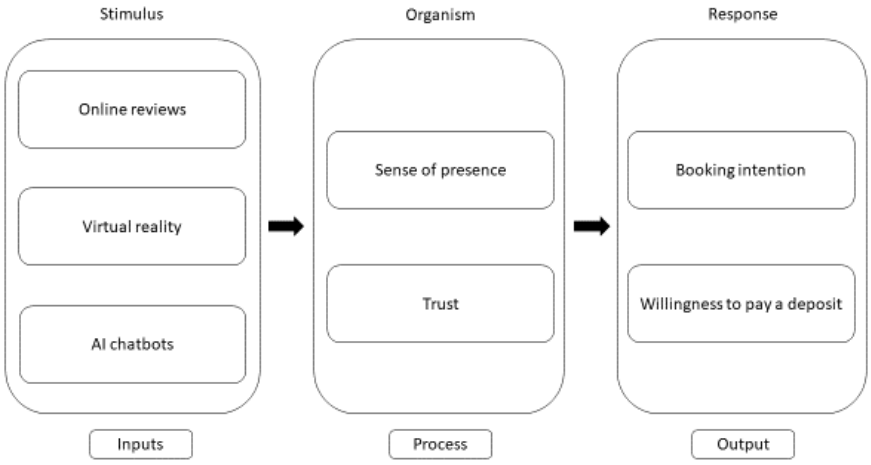
Recent advancements in tourism technology have focused on the study and implementation of state-of-the-art tools such as virtual reality and augmented reality (Han et al., 2019). While both technologies aim to enhance the perception of reality through digital means, virtual reality offers full immersion into a completely virtual environment, whereas AR overlays digital information onto the physical world without altering the real-world setting (Wei, 2019). Virtual reality has the capacity to evoke a sense of presence, defined as the psychological state in which an individual perceives themselves as "actually being there" within a computer-mediated environment, or the extent to which one feels "physically" situated within the virtual setting (Lin et al., 2020; Alyahya & McLean, 2022). Virtual reality is adopted in accommodations as a fully visual image of hotels and resorts as a way to guarantee their service quality (Slevitch et al., 2022). Virtual reality is actually helpful with first-time travelers when they lack reliable information to book or pay a deposit (Guttentag, 2010; Lim et al., 2024).

2.7. AI chatbots

Chatbots are software agents designed to mimic an entity with which users can engage in conversation (Adam et al., 2021). An AI-based chatbot is a specialized type of chatbot developed to engage in turn-by-turn conversations with human users through text input and can interact through texts or voices (Parmar et al., 2019). Simply, an AI chatbot is programmed with intelligent backend systems and can have infinite interactions with end-users (Luo et al., 2019). The AI chatbot is an automated but intelligent software that is widely adopted in various industries for handling inquiries and giving suggestions (Wüst & Bremser, 2025). The AI chatbot outperforms personnel in its availability 24/24 and time-saving. In the tourism sector, AI chatbots are being used to support and replace humans in customer service and booking systems because they can work endlessly and thus adapt to the customer requirements in this industry (Tussyadiah et al., 2020). Recent studies found that AI chatbots provided revenue opportunities and cost reduction, thereby improving business performance (Wüst & Bremser, 2025). Previous research indicated that tourists were willing to accept AI chatbots in their inquiries since it helped tourists complete their tourism-related decisions (Pillai & Sivathanu, 2020; Maharaj et al., 2025).

3 Underlying theory

In the field of consumer behavior, the Stimulus-Organism-Response (S-O-R) framework is a well-established and widely applied model used to examine how external stimuli influence individuals' internal states and subsequent behavioral responses (Suparno, 2020). Originally introduced by Mehrabian & Russell (1974), the S-O-R model conceptualizes the process by which environmental cues (stimuli) affect a person's cognitive and emotional states (organism), which in turn shape behavioral outcomes (responses). The framework has been empirically validated in communication and marketing research, where stimuli are strategically employed to influence consumer behavior in ways that benefit businesses (Tak & Gupta, 2021). Nonetheless, scholars emphasize that the effective application of the S-O-R model requires a thorough review of existing literature to appropriately identify which psychological or emotional states are most likely to be triggered by specific stimuli, and which behavioral outcomes are most relevant in a given context. Despite these challenges, the S-O-R framework remains a valuable tool for modeling the interaction between external factors and internal processes at the individual level (Jiang & Lyu, 2024). Its flexibility and robustness also allow for the examination of multiple stimuli and their influence on a variety of consumer responses, thereby offering a more comprehensive understanding of behavior in real-world environments (Zhu et al., 2021). In this study, the S-O-R framework is employed to explore the relationship between modern technological applications in hotels and their impact on tourist perceptions and behaviors, particularly in rural contexts. Specifically, online reviews, virtual reality, and AI chatbots are conceptualized as external stimuli; trust and sense of presence represent the internal organismic states; and booking intention along with willingness to place a deposit are modeled as the resulting behavioral responses. Figure 1 provides the conceptual model.



Firgure 1. The conceptual model

4. Previous related studies

Recent studies on technology adoption in tourism have affirmed that technological innovations enhance tourists' overall experiences and foster more positive behavioral intentions (Jafar et al., 2024). However, scholars emphasize that the effects of such technologies vary across different types of tourism, suggesting that research should adopt a case-by-case approach. For instance, the impact of technology in sport tourism may differ significantly from that in rural tourism (Buhalis et al., 2023). In a study conducted by Torabi et al. (2023) on the influence of smart tourism technologies on tourists' revisit intentions and word-of-mouth behavior in rural destinations in Iran, findings indicated that smart technologies contribute to memorable experiences and positively influence revisit intentions and recommendations. Nevertheless, the study primarily assessed the general attributes of smart technologies, such as accessibility, informativeness, interactivity, and personalization, without examining the specific functionalities of individual technologies.

Similarly, Bilynets et al. (2024) explored factors influencing the adoption of virtual tourism, including tourist participation and willingness to pay. While the study revealed a strong intention among tourists to engage with virtual tourism, it also found a reluctance to pay for such experiences. Despite these valuable insights, the research was limited to virtual reality, excluding other potentially impactful technologies that could further enhance tourist experiences and payment willingness. In another study, Kapri & Sharma (2024) investigated the effects of digital marketing tools, such as online travel agencies, online reviews, social media, and web GIS, on tourists' booking intentions in rural India. Their findings underscored the significance of these tools in increasing homestay bookings. However, the study focused on the mediating role of destination image rather than exploring tourists' perceptions and evaluations of the technologies themselves. Given these limitations in the existing literature on rural tourism, the present study aims to examine a broader range of innovative technologies adopted by hoteliers and their influence on tourists' booking intentions and willingness to pay a deposit. This investigation will focus on the mediating roles of tourists' sense of presence and trust in the technologies employed.

RESEARCH HYPOTHESIS DEVELOPMENT

1. The relationship between online review and sense of presence, and trust

Social media and online platforms have significantly transformed consumer behavior by enabling users to access vast amounts of information and engage in discussions about their consumption experiences. Online reviews, as a form of electronic word-of-mouth (eWOM), serve as informal communication channels through which consumers can share their evaluations, emotional reactions, and personal experiences, while also interacting with others regarding various products and services (Belarmino et al., 2021). In the digital age, consumers, especially those with no prior experience, often rely on online reviews to inform their purchase decisions (Ventre & Kolbe, 2020; Shukla & Mishra, 2023).

Zeng et al. (2020) found that online reviews are particularly valuable for first-time travelers, as they enhance the ability to visualize the hotel and increase trust in the service provider. Saha & Biswas (2025) assert that online reviews from previous guests provide authentic, experience-based insights that assist travelers in evaluating hotel quality and verifying promotional claims, thereby enhancing perceptions of credibility and familiarity. Nevertheless, rural hotels frequently face challenges related to limited online visibility and a scarcity of reviews, largely attributable to lower tourist footfall and reduced representation on digital platforms (Innerhofer et al., 2024). While prior research has emphasized the critical influence of online reviews on tourist decision-making, there remains a gap in understanding the information-seeking behavior of first-time travelers to rural destinations, particularly those who invest considerable time in gathering relevant information. Given the importance of user-generated content in shaping perceptions and reducing uncertainty, this study proposes that online reviews contribute to enhancing tourists' sense of presence and trust in hotels, particularly in rural destinations. Thus, the following hypotheses are proposed:

H1a: Online reviews have a positive relationship with tourists' sense of presence.

H1b: Online reviews have a positive relationship with tourists' trust.

2. The relationship between virtual reality and sense of presence, and trust

Virtual reality technology offers prospective guests a "try-before-you-buy" experience by enabling them to explore realistic, immersive simulations of hotel environments prior to making a booking decision (Tussyadiah et al., 2018). This form of experiential preview enhances decision-making by fostering a greater sense of control, confidence, and familiarity with the service environment (Ansari & Singh, 2023). The immersive nature of virtual reality has been widely recognized as an effective tool for enhancing travelers' understanding of hospitality services, while also strengthening brand awareness and boosting consumer confidence (Alyahya & McLean, 2022).

One of virtual reality's most notable contributions to tourism marketing is its ability to elicit a strong sense of presence, the psychological sensation of "being there" in the simulated environment. Visual and auditory representations of hotel rooms, facilities, and other key servicescapes have been found particularly influential in supporting consumers' cognitive and emotional evaluations during the pre-purchase stage (Bogicevic et al., 2017). Augmented and virtual reality technologies have been shown to enhance hotel booking experiences (Lim et al., 2024; Wu et al., 2025). However, limited research has examined the specific impact of virtual reality on tourists' booking intentions through the mediating roles of sense of presence and trust. For first-time travelers who possess minimal prior knowledge or experience, virtual reality can facilitate the formation of vivid mental representations of the hotel and foster trust by offering realistic and immersive environmental cues. Thus, the following hypotheses are proposed:

H2a: Virtual reality has a positive relationship with tourists' sense of presence.

H2b: Virtual reality has a positive relationship with tourists' trust.

3. The relationship between AI chatbots and sense of presence, and trust

AI chatbots serve as intelligent digital assistants capable of providing detailed and contextually relevant information about products and services in response to user inquiries. Powered by artificial intelligence, these chatbots can deliver comprehensive descriptions of service attributes, visual content, and even user-generated insights from previous customers. In the hospitality context, AI chatbots are believed to enhance both the sense of presence and trust during the pre-experience stage by offering timely, consistent, and informative responses to tourists' questions (Vashishth et al., 2024).

Vashishth et al. (2025) found that AI chatbots significantly enhance the overall user experience, while Shahzad et al. (2024) highlighted their pivotal role in fostering consumer trust. This is particularly pertinent for first-time travelers, who often encounter uncertainty and require comprehensive information before committing to a booking. Unlike human staff, who may be unavailable or delayed in their responses, AI chatbots provide immediate, around-the-clock assistance, effectively addressing tourists' inquiries and mitigating perceived risks (Pillai & Sivathanu, 2020; Vashishth et al., 2024). Despite growing interest in AI chatbot applications, limited research has explored their potential to influence first-time tourists' sense of presence through the delivery of visual content such as images and videos of the hotel. By streamlining the information acquisition process, AI chatbots may strengthen users' trust and enhance their perceived sense of presence within the hotel environment. Thus, the following hypotheses are proposed:

H3a: AI chatbots have a positive relationship with tourists' sense of presence.

H3b: AI chatbots have a positive relationship with tourists' trust.

4. The relationship between sense of presence and intention to book and willingness to pay a deposit

A key challenge for hoteliers, particularly in rural areas, is effectively marketing the intangible nature of their services to tourists, especially first-time travelers (Rosalina et al., 2021). Innovative technologies can address this challenge by providing immersive opportunities to enhance tourist experience, using tools such as images, text, and virtual reality (Bretos et al., 2024). Bigne & Maturana (2023) confirmed that presenting hotels through virtual reality enhances tourists' intention to book by fostering a stronger sense of presence. Scholars have generally conceptualized sense of presence as a psychological state that facilitates consumer decision-making during the pre-purchase phase. When consumers feel "present" in the environment, they are better able to assess the service and make more informed decisions (Ben Saad, 2024).

Ongsakul et al. (2021) highlighted the role of sense of presence in strengthening tourists' booking intentions, while Kim et al. (2022) demonstrated its positive influence on tourists' willingness to pay deposits in advance, particularly when immersive hotel environments were presented through virtual reality. This effect is especially relevant for first-time travelers, who often lack prior experience with the destination and are more inclined to depend on presence and trust to alleviate the perceived risks of booking accommodations in rural areas. However, recent research has been limited in investigating the relationship between sense of presence and specific behavioral outcomes, such as booking intention and deposit willingness within rural contexts, where hotels often face constraints in adopting advanced technologies due to limited resources (Sharma & Sharma, 2024). Thus, the following hypotheses are proposed:

H4a: Sense of presence has a positive relationship with tourists' intention to book a hotel.

H4b: Sense of presence has a positive relationship with tourists' willingness to pay a deposit at a hotel.

5. The relationship between trust and intention to book and willingness to pay a deposit

Trust is a critical psychological state that businesses aim to foster in consumers, as it serves to reduce perceived risks and encourage positive behavioral responses (Lata & Kumar, 2021). Building trust typically requires time and is shaped through various sources, such as prior experiences, social influence, and informational cues. In the tourism and hospitality context, consumers actively seek information that can strengthen their trust in the services they intend to use, especially when the service is unfamiliar or intangible (Ponnapureddy et al., 2019; Saha & Biswas, 2025). The newer or less familiar the offering, the more cautious consumers become, requiring more reassurance before making a decision (Ioannidis & Kontis, 2023).

In response to increasing uncertainty among travelers, particularly first-time visitors, hoteliers are progressively adopting advanced technologies to enhance perceived trust. Shukla & Mishra (2023) found that trust significantly influenced Chinese tourists' hotel booking intentions, while Augusto et al. (2020) demonstrated its critical role in increasing consumers' willingness to pay for digital streaming services. Despite the well-established importance of trust in shaping consumer behavior, limited research has specifically examined the trust-building process among first-time travelers to rural destinations. These travelers often face heightened perceived risks when booking accommodations or paying deposits, especially in rural areas where service quality may be inconsistent and online visibility is limited. As a result, tourists are more inclined to engage with hotels that appear more trustworthy and secure. Thus, the following hypotheses are proposed:

H5a: Trust has a positive relationship with tourists' intention to book a hotel.

H5b: Trust has a positive relationship with tourists' willingness to pay a deposit at a hotel.

In summary, grounded in the S-O-R framework and supported by prior research, this study proposes a conceptual model in which online reviews, virtual reality, and AI chatbots serve as stimuli; sense of presence and trust function as organismic states; and booking intention and willingness to pay a deposit represent the responses. Within this framework, sense of presence and trust are posited as mediating variables that connect the influence of innovative technologies to tourists' behavioral intentions. Given the study's objective is to examine how recently adopted technologies in hotel settings, including online reviews, virtual reality, and AI chatbots, affect booking intention and willingness to pay a deposit among first-time travelers to rural destinations in Vietnam through the roles of presence and trust, the proposed research model is considered theoretically appropriate and well-aligned with the study's aims. Figure 2 shows the research model with research hypotheses.

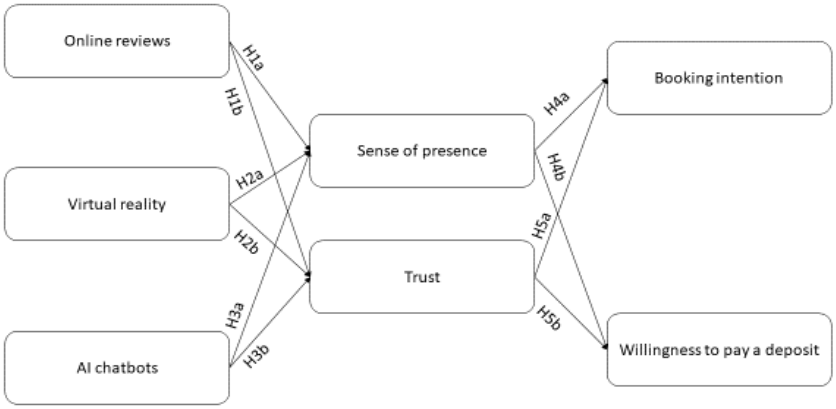


Figure 2. The research model

RESEARCH METHODOLOGY

1. Data collection

A survey was designed to collect quantitative data from the respondents. There were composed of two parts in a questionnaire for a respondent to give his/her answers. The first part was evaluative criteria, which included seven constructs. Reflective measurement scales were adapted to measure the constructs, especially: (1) online review with four items from Park & Lee (2009); (2) virtual reality with four items from Guttentag (2010) and Lin et al. (2020); (3) AI chatbot with four items from Tussyadiah et al. (2020) and Maharaj et al. (2025); (4) sense of presence with five items from Kim & Biocca (1997) and Bogicevic et al. (2019); (5) trust with three items from Zhang et al. (2019); (6) intention to book with three items from Tussyadiah et al. (2018); and (7) willingness to pay a deposit with three items from Laroche et al., (2001), as cited in Yoon et al. (2021). Table 1 provides the constructs instruments. A 5-point Likert scale was employed to evaluate the level of agreeableness on each indicator ranging from 1 as "strongly disagree" to 5 as "strongly agree".

The second part was demographic information such as gender, age, education level, and income level. The closed-end questions with multiple choices were applied for this part. First-time Vietnamese travelers were the main target of the study. To ensure this criteria, the form had detailed guidelines for respondents before taking the survey.

Table 1. The construct measurement items

Node	Measurement scale	Adapted sources
Online review		
ONL1	Online consumer reviews are useful to me.	Park & Lee (2009)
ONL2	Online consumer reviews make booking easier.	
ONL3	Online consumer reviews make me a smarter traveler.	
ONL4	Online consumer reviews are very beneficial to me.	
Virtual reality		
VR1	I could clearly see the lobby of the hotel.	Guttentag (2010); Lin, Huang, & Ho (2020)
VR2	It seemed like I was moving in the hotel.	
VR3	I seemed to walk around places inside the hotel.	
VR4	I could clearly see the room of the hotel.	
AI chatbots		
AI1	AI chatbots help in providing personalized hotel recommendations.	Luo et al. (2019); Tussyadiah et al. (2020); Maharaj et al. (2025)
AI2	The AI-powered chatbots promptly answer my queries.	
AI3	AI chatbots enhance the efficiency of the booking process.	
AI4	I could easily interact with AI chatbots.	
Sense of presence		
SP1	When I finished the hotel preview, I felt like I came back to the "real hotek" after a journey.	Kim & Biocca (1997); Bogicevic et al. (2019)
SP2	The hotel preview created a new world for me, and the world suddenly disappeared when I finished the preview.	
SP3	The world generated by the hotel seemed to me like "somewhere I visited" rather than "something I saw".	
SP4	While I was previewing the hotel suite, I felt I was in the world of hotel.	
SP5	While I was previewing the hotel suite, I sometimes forgot that I was in the middle of an experiment.	
Trust		
TR1	I feel that the information about the hotel provided is honest and authentic.	Zhang et al. (2019)
TR2	I feel that the information about the hotel provided is reliable.	
TR3	I feel that the information about the hotel provided is trustworthy.	
Hotel booking intention		
BI1	I am willing to book the hotel when traveling.	Tussyadiah et al. (2018)
BI2	I plan to book the hotel when traveling.	
BI3	I will make an effort to book the hotel when traveling.	
Willingness to pay a deposit		Laroche et al., (2001), as cited in Yoon et al. (2021)
WTP1	I would pay a deposit for the hotel to reserve a room.	
WTP2	I am willing to pay a deposit in order to reserve a room.	
WTP3	I believe it is acceptable to pay a deposit to reserve a room	

The respondents were asked to think they were first-time travelers to a rural destination in Vietnam and were selecting hotels. The form gave examples about online reviews, AI chatbots in handling inquiries, and links for respondents trying virtual reality to make sure respondents knew those modern technologies before they gave their answers. The convenience sampling method was employed to approach the main respondents.

2. Data analysis

The quantitative data was analyzed by SPSS and AMOS. Cronbach's alpha and composite reliability were assessed to check the reliability of constructs in the research model. The confirmatory factor analysis (CFA) was performed to check the convergent and discriminant validity before the structural equation modeling (SEM) was performed to test the research hypotheses. The average variance extraction (AVE) was checked to check the convergent validity (AVE>0.5) and the discriminant validities of constructs were achieved when the square root of the AVE was greater than the correlation between the constructs or MSV (Maximum Shared Variance) < AVE and ASV (Average Shared Variance) < AVE. The model fit of both the CFA and SEM will be followed by the threshold values suggested by Hu and Bentler (1999). The hypotheses will be confirmed at a p-value of 0.05. Given the use of a convenience sampling method, common method bias (CMB) was assessed. Harman's single-factor test was conducted using exploratory factor analysis in SPSS. All items were loaded onto a single factor using the principal component method without rotation. The results indicated that the first factor accounted for 26.5% of the total variance, which is below the recommended threshold of 50% (Podsakoff et al., 2003). Therefore, it was concluded that common method bias was not a significant concern in this study.

DATA ANALYSIS AND RESULTS

1. Descriptive statistics

After six months, the survey collected 464 valid responses. Among the respondents, 186 were male (43.8%) and 239 were female (56.2%). In term of age, 204 participants were under 25 years old, 131 were between 26 and 35, 54 were between 36 and 45, and the remaining respondents were over 45. In terms of monthly income, 153 individuals earned less than 10 million VND, 178 earned between 10 and less than 20 million VND, 78 earned between 20 and less than 30 million VND, and the remaining earned more than 30 million VND. The descriptive statistic of the sample is presented in Table 2, and the graphical characteristics of the sample is shown in Figure 3.

Table 2. The descriptive statistics of the sample (Source: From this study's analysis)

Criteria		n	%
Gender	Male	186	43.8
	Female	239	56.2
Age range	<25	204	48
	26-35	131	30.8
	36-45	54	12.7
	>45	36	8.5
Income level	Less than 10 million VND	153	36
	Between 10- <20 million VND	178	41.9
	Between 20- <30 million VND	78	18.4
	Between 30-<50 million VND	16	3.8
Education level	High school or below	39	9.2
	Vocational	12	2.8
	Undergraduated	306	72
	Post-graduated	68	16

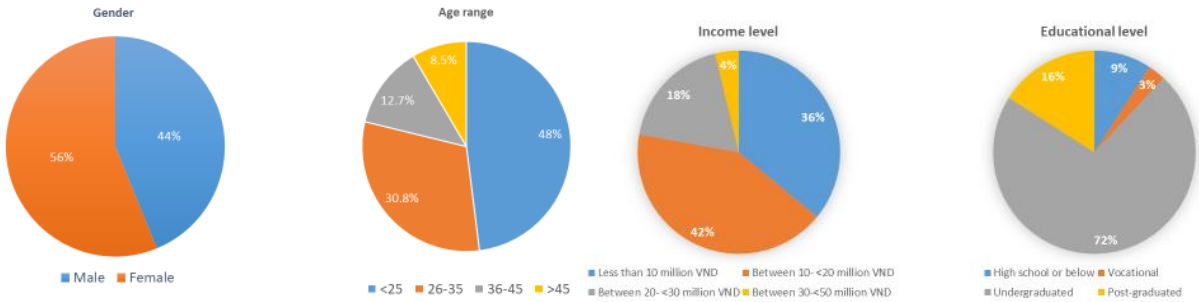


Figure 3. The graphical characteristics of sample

2. Reliability and validity

The internal consistency of the constructs was assessed using Cronbach's Alpha, with all constructs exhibiting values above the acceptable threshold of 0.7. Exploratory Factor Analysis (EFA) was then conducted to identify the underlying factor structure. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.85, exceeding the recommended minimum value of 0.6, and Bartlett's test of sphericity was statistically significant, indicating the suitability of the data for factor analysis. The EFA explored seven latent factors, which accounted for 61.5% of the total variance. Then the CFA was performed to

assess eight extracted factors in terms of their reliability and validity. The composite reliability (CR) of all constructs was higher than 0.6, while the average variance extracted was higher than 0.5, supporting the constructs' convergent validity. The discriminant validities of constructs were achieved when MSV > MSA. The model fit of CFA was satisfactory: (1) Cmin/df = 1.26; (2) CFI = 0.988; (3) PCFI = 0.816; and (4) RMSEA = 0.025. Table 3 provides the construct measurements.

Table 3. The constructs measurements (Source: From this study's analysis)

	CR	AVE	MSV	ASV	WTPa	ONLa	VRa	AIa	SPa	Tra	BIa
WTPa	0.870	0.690	0.208	0.147	0.831						
ONLa	0.847	0.581	0.203	0.106	0.395	0.762					
VRa	0.799	0.5	0.211	0.117	0.456	0.218	0.706				
AIa	0.809	0.586	0.072	0.029	0.269	-0.044	-0.120	0.766			
SPa	0.797	0.567	0.179	0.075	0.348	0.144	0.423	0.191	0.753		
TRa	0.830	0.620	0.203	0.089	0.349	0.451	0.208	0.100	0.078	0.787	
BIa	0.895	0.739	0.211	0.149	0.449	0.451	0.459	0.203	0.298	0.387	0.860

3. Hypotheses examination

All constructs demonstrated acceptable reliability and validity, allowing for the analysis of structural equation modeling (SEM) using AMOS. The model achieved a satisfactory fit to the data, as indicated by the following fit indices: (1) χ^2/df = 1.86, (2) Comparative Fit Index (CFI) = 0.96, (3) Parsimonious CFI (PCFI) = 0.82, and (4) Root Mean Square Error of Approximation (RMSEA) = 0.045. Table 4 presents the standardized path coefficients and the results of hypothesis testing.

Table 4. Standardized path estimates and hypotheses testing in the study (Source: From this study's analysis)

Structural paths	Standardized regression weight	p-value	Conclusion at p<0.05
H1-a: Online review → Sense of presence	0.08	ns	Rejected
H1-b: Online review → Trust	0.46	***	Supported
H2-a: Virtual reality → Sense of presence	0.48	***	Supported
H2-b: Virtual reality → Trust	0.15	**	Supported
H3-a: AI chatbot → Sense of presence	0.28	***	Supported
H3-b: AI chatbot → Trust	0.15	**	Supported
H4-a: Sense of presence → Booking intention	0.32	***	Supported
H4-b: Sense of presence → Willingness to pay a deposit	0.37	***	Supported
H5-a: Trust → Booking intention	0.4	***	Supported
H5-b: Trust → Willingness to pay a deposit	0.36	***	Supported

Note: ***: p-value < 0.001

H1-b is supported, which proposes that online review has a positive influence on tourists' trust in a hotel (β = 0.46***) while H1-a is rejected, which means that online reviews do not influence positively the sense of presence.

H2-a and H2-b are supported, which propose that virtual reality positively influences tourists' sense of presence and trust in a hotel. Virtual reality has a stronger impact on the sense of presence (β = 0.48***) and trust (β = 0.15**).

H3-a and H3-b are supported, which propose that AI chatbots positively influence tourists' sense of presence and trust in a hotel. AI chatbot has a more significant impact on the sense of presence (β = 0.28***) and trust (β = 0.15***).

H4-a and H4-b are supported, which propose that a tourist's sense of presence in a hotel will positively influence booking intention and willingness to pay a deposit. The influence levels are compatible with booking intention (β = 0.32***) and willingness to pay a deposit (β = 0.37***).

H5-a and H5-b are supported, which propose that tourists' trust in a hotel will positively influence booking intention and willingness to pay a deposit. The influence levels are also compatible with booking intention (β = 0.4***) and willingness to pay a deposit (β = 0.36***). Figure 4 provides the research model path analysis and the support of research hypotheses.

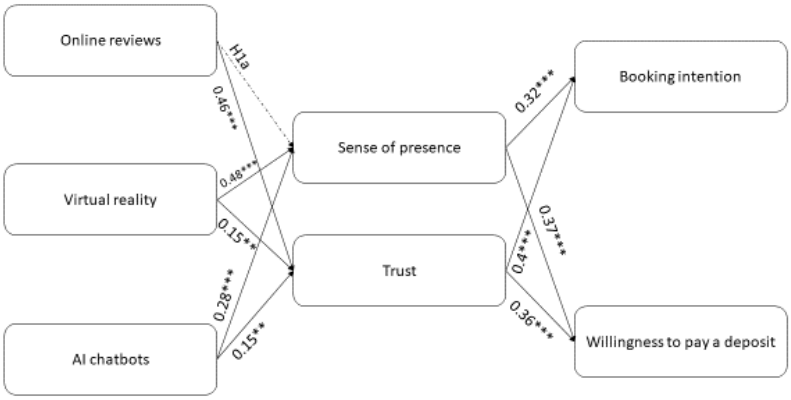


Figure 4. The research model path analysis

DISCUSSION AND IMPLICATION

1. Discussions on findings

Recent innovations in technology have been widely adopted in the tourism and hospitality industry, offering state-of-the-art solutions to enhance tourist engagement and influence decision-making. A growing body of research has confirmed that modern tools, such as online reviews, virtual reality, and AI chatbots significantly enhance tourist experiences and satisfaction, thereby increasing behavioral intentions and engagement (Tussyadiah et al., 2018; Pillai & Sivathanu, 2020; Ventre & Kolbe, 2020; Zeng et al., 2020; Liu et al., 2024; Shahzad et al., 2024). However, existing studies offer limited insight into how various technological tools jointly influence tourists' emotional reactions and decision-making processes. This is an important gap, as hoteliers often deploy multiple technologies simultaneously to promote their services. A more comprehensive understanding of how these technologies interact to shape tourist perceptions and behaviors is essential, particularly for underserved markets such as rural destinations. This study addresses three key areas of discussion, grounded in empirical evidence from Vietnamese tourists, with a particular focus on first-time travelers.

First, the findings confirm that online reviews, virtual reality, and AI chatbots serve as valuable tools for assisting tourists in evaluating hotel services. In line with prior research, both virtual reality and AI chatbots were found to significantly enhance tourists' sense of presence and trust toward hotels they had not previously experienced (Tussyadiah et al., 2018; Shahzad et al., 2024). Virtual reality offers immersive visualizations of hotel environments, while AI chatbots provide quick, accurate responses to inquiries, allowing tourists to experience a simulated version of being "there," which builds a sense of security and familiarity. Interestingly, the study finds that online reviews positively influence tourists' trust but do not significantly affect their sense of presence. This may be explained by the fact that user-generated reviews and peer interactions, though credible, lack the immersive quality necessary to evoke a psychological sense of being in the environment. This finding aligns with Book et al. (2018), who emphasized the role of online reviews as a form of social influence rather than an experiential simulation.

Second, the results confirm that both sense of presence and trust are essential psychological states that drive tourists' intention to book and willingness to pay a deposit. These findings support earlier work (Augusto et al., 2020; Kim et al., 2022) highlighting the critical role of internal cognitive and emotional processes in shaping behavioral intentions. The study aligns with the Stimulus-Organism-Response (S-O-R) framework, demonstrating how external stimuli, such as modern technologies, are internalized by consumers and subsequently influence their decision-making. Notably, both sense of presence and trust exert comparably strong effects on tourists' booking intentions and willingness to pay a deposit. This underscores the dual importance of cognitive-emotional reassurance for first-time travelers, who often lack prior experience and may struggle to differentiate between behavioral responses without adequate information.

Finally, this study contributes novel insights by examining the impact of these technologies in the unique context of rural tourism, where technical infrastructure and digital presence are often limited. Unlike previous research conducted in well-developed tourism destinations with experienced travelers (Yoon et al., 2021; McLean & Barhorst, 2022), this study focuses on first-time travelers evaluating accommodations in rural areas, where uncertainty and service quality concerns are higher. The findings reveal that online reviews, virtual reality, and AI chatbots effectively reduce the informational and psychological gaps that hinder booking behavior in such settings. These technologies help to mitigate perceived risks, build confidence, and ultimately bridge the gap between perception and intention, thereby encouraging first-time tourists to proceed with bookings and deposit payments.

2. Theoretical implications

This study offers several theoretical contributions to the literature in the hospitality and tourism industry. First, it provides empirical validation of the Stimulus–Organism–Response (S-O-R) framework in explaining how modern technologies influence tourists' behavioral intentions. Specifically, online reviews, virtual reality, and AI chatbots function as external stimuli that impact internal psychological states, namely, sense of presence and trust, which in turn shape behavioral responses such as the intention to book and the willingness to pay a deposit.

Second, the study extends the contextual application of the S-O-R framework by demonstrating its relevance in managing marketing information within the tourism and hospitality sector. It emphasizes the importance of understanding tourists' perceptual and emotional processes in shaping their evaluation and decision-making behavior, particularly in service environments characterized by intangibility and uncertainty.

Finally, this research contributes a methodological advancement by applying a quantitative approach to assess the impact of technology on tourists' booking behaviors. Through the use of self-reported questionnaires, respondents were asked to imagine their experiences with online reviews, virtual reality, and AI chatbots in the context of hotel booking decisions. This approach supports the robustness of the framework and offers a replicable method for future research in similar contexts.

3. Managerial implications

This study provides several managerial implications for hoteliers operating in rural areas of Vietnam. First, with the increasing availability and affordability of innovative technologies, hotel managers should strategically invest in tools that are both feasible and impactful. The study highlights that online reviews, virtual reality (VR), and AI chatbots significantly enhance tourists' sense of presence and trust, two key psychological states that influence booking behavior. Among these, virtual reality was found to exert the strongest effect on sense of presence, allowing prospective guests to engage in a "try-before-you-go" experience that helps them visualize and better understand the hotel environment. This is particularly beneficial in the rural context, where services are intangible and travelers, especially first-time visitors, often lack prior knowledge or experiences to inform their decisions. VR and AI chatbots activate tourists' sensory imagination and provide vivid visual cues, which can compensate for the absence of physical interaction and information.

For rural hoteliers, persuading first-time travelers is challenging due to limited visibility and infrastructure. Virtual reality and AI chatbots serve to bridge this gap by offering immersive previews and immediate, accurate responses to inquiries, thereby increasing tourists' confidence and reducing perceived risk. Alyahya & McLean (2022) emphasize that guests can begin forming emotional connections with a property even before the actual visit through such pre-experiential engagement. Supporting this, the current study affirms that hotel managers should utilize VR and AI chatbots not just as technological enhancements, but as critical marketing tools to provide realistic simulations and foster customer confidence. Aligning with Zeng et al. (2020), the study also suggests that virtual reality is more effective than online reviews in driving behavioral intentions, although AI chatbots can complement VR by delivering additional sensory and informational support.

Second, the study finds that all three technologies, VR, AI chatbots, and online reviews, significantly enhance tourists' trust in hotels. Notably, online reviews had the strongest impact on trust, even though they did not influence the sense of presence. This underscores the influential role of social proof in shaping perceptions, especially among first-time travelers. Hoteliers should actively manage their online reviews across platforms, including their own websites, online travel agencies, and social media. Since tourists often rely on peer-generated content to assess service quality and reliability, showcasing positive reviews and responding constructively to negative feedback can help build and maintain trust.

Third, the sense of presence and trust are found to be critical psychological drivers of booking intentions and willingness to pay a deposit. When tourists feel familiar with and confident in a hotel, they are more likely to proceed with their reservation and even commit financially in advance. Therefore, hoteliers in rural areas should prioritize enhancing these two psychological states through digital tools, recognizing them as precursors to actionable consumer behavior.

Finally, this study shows that technological interventions not only influence intention to book but also significantly increase tourists' willingness to pay a deposit, a behavior indicative of deeper commitment and higher conversion likelihood. Willingness to pay a deposit is a more profitable and reliable performance metric than intention alone, as it suggests a greater probability of actual check-in. Given the challenges rural hoteliers face in encouraging this behavior, they are advised to leverage modern technologies as persuasive tools that deliver compelling pre-experiences and build trust. Tourism marketers should collaborate with technology developers to ensure timely, rich, and personalized information is provided to prospective guests. By integrating multiple digital touchpoints, especially virtual reality, AI chatbots, and curated online reviews, hoteliers can effectively overcome information asymmetries and encourage bookings from first-time travelers.

4. Limitations and future directions

While this study offers valuable theoretical and practical implications, several limitations should be acknowledged to guide future research. First, the study focuses on intention and willingness rather than actual behaviors. Although intention is often positively correlated with behavior, the relationship is not always consistent (Wang et al., 2018). Future studies are encouraged to measure actual behaviors, such as decisions to book, to address this gap. Second, this study considers only three modern technologies including online review, virtual reality, and AI chatbots that influence tourist's sense of presence, trust, booking intention, and willingness to pay a deposit. However, other modern technologies and their joint effects were not examined. In addition, no moderating variables were included, despite the possibility that factors such as gender or education could lead to differential outcomes. Future research should explore other modern technologies and potential moderators to deepen the understanding of tourist behaviors. Third, the study does not account for differences across tourist segments, despite evidence suggesting such variation plays a key role in understanding touristic habits. For instance, Ozdemir-Guzel & Bas (2021) highlight that Generation Z travelers are more responsive to modern technologies. Future research should consider segmenting tourist groups to enhance the predictive power of the model and provide more nuanced insights. Finally, the use of convenience sampling may introduce bias and limit the generalizability of the findings. Future studies are recommended to employ more rigorous sampling techniques to improve the representativeness and validity of the results.

CONCLUSION

This study has explored how modern technologies affect tourists' behavioral intentions in the context of rural tourism in Vietnam. Using the Stimulus-Organism-Response (SOR) framework, the research demonstrates that these technologies serve as effective stimuli that enhance tourists' internal states, which, in turn, significantly influence their intention to book rural accommodations and their willingness to pay a deposit.

The findings confirm that different technologies impact psychological states in distinct ways. Online reviews emerged as the most influential factor in building trust, VR was effective in creating a sense of presence, and AI chatbots contributed meaningfully to both dimensions by improving information accessibility and customer interaction.

From a practical perspective, the study underscores the importance for rural tourism hoteliers to invest in digital tools for building trust and enhancing sense of presence among potential visitors. Employing interactive technologies not only increases tourists' decision-making experiences but also strengthens the emotional and cognitive connections with destinations, thereby increasing the likelihood of booking and financial commitment. In the context of emerging economies like Vietnam, such innovations are critical for improving the visibility and competitiveness of rural destinations.

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