UNDERSTANDING CONSUMER INTENTION TO ADOPT AI CHATBOTS IN SAUDI TOURISM A CONCEPTUAL FRAMEWORK

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Abstract

Purpose: This research investigates the determinants influencing travelers' intention to adopt and use AI-driven chatbots in tourism planning and decision-making. Despite the growing integration of artificial intelligence (AI) in the tourism and hospitality industry, scholarly research on chatbot applications remains limited. This study aims to bridge this theoretical and empirical gap by examining how personal innovativeness moderates the relationships between perceived behavioral control, attitude, initial trust, and subjective norm toward the intention to use AI chatbots for travel planning. **Methodology - Design-based approach:** The study integrates the Diffusion of Innovation (DOI) theory and the Theory of Planned Behaviour (TPB), incorporating key constructs indirectly linked to the Technology Acceptance Model (TAM). A quantitative, cross-sectional design will be employed, and data will be collected through purposive sampling targeting individuals with digital travel experience. Fourteen hypotheses will be tested using structural equation modeling (SEM) to validate the proposed framework. **Findings:** The anticipated findings are expected to demonstrate that perceived behavioral control, attitude, initial trust, and subjective norm significantly influence the intention to use AI chatbots, with personal innovativeness serving as a crucial moderating factor. These results will contribute to extending existing technology adoption theories to the tourism context. **Research limitations- implications:** The study may be limited by its reliance on self-reported data, potential sampling bias, and the cross-sectional design, which restricts causal inference. Future research should consider longitudinal approaches, larger and more diverse samples, and inclusion of variables such as perceived enjoyment or anthropomorphism of AI chatbots to enhance model robustness. **Practical implications:** Findings from this study will guide tourism practitioners and stakeholders in developing effective strategies to promote AI-driven chatbot adoption. Enhancing user trust, personalization, and perceived usefulness will be key to improving digital travel experiences and operational efficiency within the tourism sector. **Originality-value:** This study is among the first to develop and empirically test an integrated model combining DOI, TPB, and TAM to explain the adoption of AI chatbots in tourism. It contributes novel theoretical insights and practical guidance for leveraging smart technologies to enhance the digital travel experience.

Keywords: AI chatbots; Tourism adoption; Theory of Planned Behavior; Diffusion of Innovations; User intention; Smart tourism, Saudi Arabia.

INTRODUCTION

Artificial intelligence (AI) is profoundly transforming the tourism and hospitality industry by enabling greater efficiency, personalization, and real-time interaction. Among its many applications, AI-driven chatbots have emerged as one of the most visible innovations, offering travelers personalized recommendations, instant customer service, and seamless digital engagement throughout their journey. These technologies are transforming the way tourists plan, book, and experience travel, while also enhancing

operational performance for businesses. Despite their growing adoption across sectors, scholarly attention to AI chatbots in tourism remains limited compared to other digital technologies such as social media, virtual reality (VR), and augmented reality (AR) (Brandtzaeg & Følstad, 2017; McLean et al., 2020; Rafiq et al., 2022). With the rapid advancement of large language models (LLMs), understanding travelers' behavioral intentions toward AI chatbots has become even more pertinent (Dwivedi et al., 2024; Cimino et al., 2024).

Tourism is a vital driver of economic growth, employment, and cross-cultural exchange worldwide (Arabeyyat & Aldweik, 2024; Kyriakidis et al., 2024). Domestic tourism—defined as residents traveling within their own country (UNWTO, 2010)—represents the majority of tourism expenditure and has gained renewed importance following the COVID-19 pandemic (OECD, 2022). In Saudi Arabia, tourism plays a central role in Vision 2030, which emphasizes diversification through innovation and digital transformation.

The country has experienced a strong post-pandemic rebound in both domestic and international travel (Arab News, 2024; Financial Times, 2024; Trading Economics, 2024). However, while domestic travel accounts for most trips, per-capita spending remains significantly lower than that of international visitors, signaling the need for enhanced personalization and digital service integration (Financial Times, 2024; RoadGenius, 2024). Despite high levels of awareness and exposure to AI, actual usage among Saudi consumers remains relatively modest (KPMG, 2025; BCG, 2024; Saudi Center for Opinion Polls, 2025).

This "adoption gap" underscores a critical challenge: understanding not just the technological readiness, but also the psychological, cultural, and behavioral factors influencing AI acceptance in tourism contexts. Previous studies employing technology adoption frameworks—such as the Technology Acceptance Model (TAM), the Diffusion of Innovation (DOI), the Theory of Planned Behavior (TPB), and the Unified Theory of Acceptance and Use of Technology (UTAUT)—have produced mixed findings regarding the roles of attitude, subjective norm, and perceived behavioral control. Moreover, they often overlook human-centered variables such as personal innovativeness, initial trust, digital literacy, and perceived risk, all of which are crucial when AI systems act autonomously in search, booking, and payment processes.

Addressing these theoretical and empirical gaps, the present study investigates the determinants of travelers' intention to adopt AI chatbots for tourism in Saudi Arabia. Building on TPB and integrating elements from DOI and TAM, the research proposes a comprehensive model that captures both technological and psychological dimensions of adoption.

The study also explores the moderating role of personal innovativeness in shaping the link between user perceptions and behavioral intention. By providing context-specific evidence, the study contributes to the literature on smart tourism adoption and offers practical insights for policymakers, technology developers, and service providers seeking to enhance digital travel experiences in alignment with Saudi Arabia's Vision 2030 goals.

LITERATURE REVIEW

AI-chatbots are transforming digital interactions across industries by enhancing personalization, efficiency, and user satisfaction. In tourism, however, research on AI chatbot adoption remains limited compared to studies on social media, VR, and AR applications. Table 1 summarizes key empirical studies examining users' intention to use AI-chatbots across different service contexts. Ludwig et al. (2024) found that perceived usefulness, trust, and enjoyment predict chatbot adoption at airports. In contrast, Liu et al. (2024) reported that anthropomorphic features and perceived ease of use strengthen consumers' intention to share and purchase through chatbots. Tosyali et al. (2023) demonstrated that informativeness in chatbot interactions improves destination image and visit intention in Turkey. Zhang et al. (2023) identified performance expectancy and social influence as key predictors of chatbot use in China's banking sector. In Saudi Arabia, Alfayad et al. (2023) used the Theory of Planned Behavior (TPB) to show that attitude, subjective norm, and perceived behavioral control significantly influence healthcare chatbot use, whereas Bae and Lee (2024) emphasized the importance of emotional engagement and responsiveness in predicting satisfaction and reuse intention in retail contexts. Collectively, these studies indicate that while chatbot adoption drivers vary across domains, trust, usefulness, and emotional engagement consistently shape behavioral intention. The Theory of Planned Behavior (TPB) (Ajzen, 1991) serves as a foundational framework in predicting behavioral intentions. It proposes that attitude, subjective norm, and perceived behavioral control determine an individual's intention to perform a behavior. Attitude reflects a favorable evaluation of chatbot use, subjective norm captures perceived social approval, and perceived behavioral control represents perceived ease or difficulty of use (Lopez-Mosquera, 2016). TPB is thus relevant for understanding psychological determinants of AI-chatbot adoption, particularly when technological confidence and social influences are key considerations. Complementing TPB, the Diffusion of Innovation (DOI) theory (Rogers, 1962; 2003) explains how innovations spread within social systems. DOI identifies five key attributes—relative advantage (here represented by personalization), compatibility, complexity, trialability, and observability—that shape adoption decisions. In tourism, these dimensions influence how travellers perceive AI-chatbots as useful, easy to try, and compatible with existing behaviours. Trialability and observability are especially critical, as tourists often rely on experimentation and observation of peers before adopting new digital tools. Comparative models of technology acceptance further strengthen the theoretical foundation. The Technology Acceptance Model (TAM) highlights perceived usefulness and ease of use (Davis, 1989), while UTAUT2 emphasizes performance expectancy and social influence (Venkatesh et al., 2012). Protection Motivation Theory (PMT) contributes by linking perceived control to coping behavior during technological change. Integrating these perspectives provides a comprehensive view of adoption determinants. Grounded in these theories, the present study proposes a hybrid framework combining TPB and DOI, supported by TAM constructs such as personalization and compatibility. The model posits that attitude, subjective norm, perceived behavioral control, personalization, compatibility, trialability, and observability directly or indirectly influence tourists' intention to use AI-

chatbots. Furthermore, trust and personal innovativeness are introduced as moderators, capturing differences in confidence and willingness to adopt emerging technologies. This integrated approach extends prior research by addressing cultural and contextual gaps in AI adoption within Saudi Arabia's tourism sector, offering actionable insights for enhancing smart tourism experiences under Vision 2030.

Table 1: Previous Studies on Intention to Use AI-Chatbot Applications

Author(s) /Year	Chatbot Context	Theory/Model	Method	Country	Key Findings
Glowka et al. (2024)	Airport customer-service chatbots	Extended TAM with Trust & Enjoyment	Survey (n = 191)	Austria	Perceived usefulness, ease of use, trust, and enjoyment positively predicted intention to use chatbots at airports; usefulness had the strongest effect
Liu et al. (2024)	Consumer AI chatbot usage intention	Extended TAM with Anthropomorphism	Experimental survey	China	Usefulness, ease of use, and anthropomorphic appearance significantly influenced attitude and intention to share and purchase via chatbot platforms
Tosyali et al. (2023)	Tourist-chatbot interaction & visit intention	SEM via Destination Image	Two studies (N=111, 184)	Turkey	Informativeness during chatbot interactions enhanced destination image, which in turn increased tourists' intention to visit destinations
Zhang et al. (2023)	Banking chatbots for financial services	UTAUT2	Survey (n = 315)	China	Performance expectancy, effort expectancy, and social influence were significant predictors of chatbot adoption intention
Alfayad et al. (2023)	Healthcare chatbots	TPB	Survey (n = 247)	Saudi Arabia	Attitude, subjective norm, and perceived behavioral control significantly influenced the intention to use AI chatbots for medical consultations
Bae & Lee (2024)	Retail customer service AI chatbots	Stimulus-Organism-Response (S-O-R)	Online experiment	South Korea	Emotional engagement and perceived responsiveness positively influenced satisfaction and intention to reuse chatbots
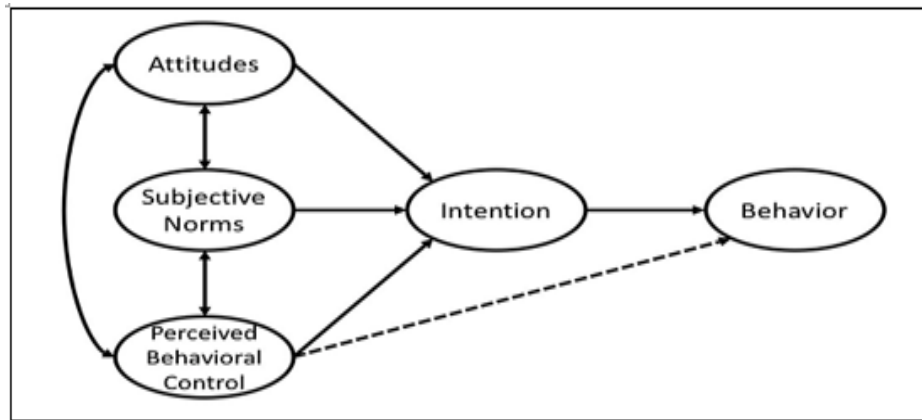
Figure 1: Theory of Planned Behavior (Ajzen, 1991)
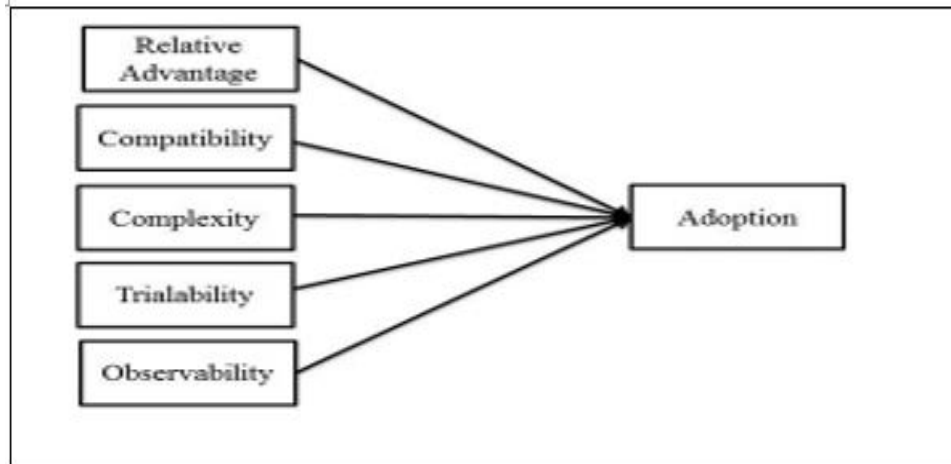
Figure 2: Diffusion of Innovation Theory (Roger, 1983)

Table 2: Comparison of the following theories of Technologies Acceptance

Unified Model	Constructs	TAM	TPB	DOI	PMT	TAM2	UTAUT	UTAUT2
Perceived Behavioral Control	Self-efficacy/ Facilitating Conditions	—	✓	—	✓	—		✓
Subjective Norm	Social Influence	—	✓	—	—	✓	✓	✓
Attitude	—	✓	✓	—	—	✓	—	—
Compatibility	Perceived Usefulness	—	—	✓	—	—	—	—
Perceived usefulness	Performance Expectancy/ Relative Advantage	✓	—	✓	—	✓	✓	✓
Trialability		—	—	—	✓	—	—	—	—
Observability	—	—	—	✓	—	—	—	—

Hypothesis Development

Drawing on the conceptual foundations of the Diffusion of Innovation (DOI), Theory of Planned Behavior (TPB), and Technology Acceptance Model (TAM), this study proposes fifteen hypotheses that explain the relationships among digital literacy, perceived behavioral control, personalization, attitude, trust, and adoption intention toward AI chatbots in tourism. Digital literacy, encompassing technical, cognitive, and problem-solving competencies, enhances users' confidence in navigating digital platforms (Bawden, 2008; Gilster, 1997). Individuals with stronger **digital literacy** demonstrate greater perceived behavioral control, enabling smoother interaction with AI systems (Kim & Park, 2019; Prasetyo et al., 2024).

H1: Digital literacy positively affects perceived behavioral control.

Perceived usefulness—the belief that technology enhances performance (Davis, 1989)—and compatibility—the alignment of technology with user needs (Rogers, 2003)—both strengthen positive attitudes and increase the willingness to adopt AI-driven services (Xavier et al., 2024).

H2: Perceived usefulness positively affects attitude.

H3: Compatibility positively affects attitude.

Trialability, or the ability to experiment with a system before full adoption, builds familiarity and trust (Raman et al., 2024).

H4: Trialability has a positive effect on initial trust.

Observability, defined as the visibility of technology use among peers, reinforces subjective norms through social influence and perceived desirability (Tseng, 2025).

H5: Observability positively affects subjective norm.

Perceived behavioral control (PBC) reflects confidence in using technology and consistently predicts adoption intention across domains (Sujood et al., 2024; Tai et al., 2024).

H6: Perceived behavioral control positively affects intention to use AI chatbots.

Attitude represents an individual's positive or negative evaluation of chatbot use and strongly predicts behavioral intention (Ajzen & Fishbein, 1980; Lu et al., 2025).

H7: Attitude positively affects intention to use AI chatbots.

Initial trust, the belief in system reliability and benevolence, reduces uncertainty and facilitates adoption (McKnight et al., 2002; Bawack et al., 2022).

H8: Initial trust positively affects intention to use AI chatbots.

Subjective norm—social pressure to perform a behavior—significantly influences technology use, particularly in collectivist contexts (Ajzen, 1991; Wang et al., 2025).

H9: Subjective norm positively affects intention to use AI chatbots.

H10: PI strengthens the effect of subjective norm on intention to use.

Proposed Framework and Conceptual Overview

This study integrates the Theory of Planned Behavior (TPB) and Diffusion of Innovations (DOI), supplemented by key TAM constructs, to examine users' intentions to adopt AI chatbots in tourism. Focusing on first-time use behavior—a neglected area in tourism research—the model (Figure 2.4) proposes thirteen relationships combining attitudinal and innovation-based factors. Attitude, shaped by compatibility and personalization, serves as the central predictor of behavioral intention. Trialability and observability capture innovation-driven influences, while perceived behavioral control, enhanced by digital literacy and individual innovativeness, reflects users' confidence in engaging with AI chatbots. Furthermore, trust and personal innovativeness are introduced as moderators, clarifying how and under what conditions positive attitudes translate into adoption intentions. Overall, this framework provides a comprehensive and context-sensitive understanding of AI-chatbot adoption in the tourism sector
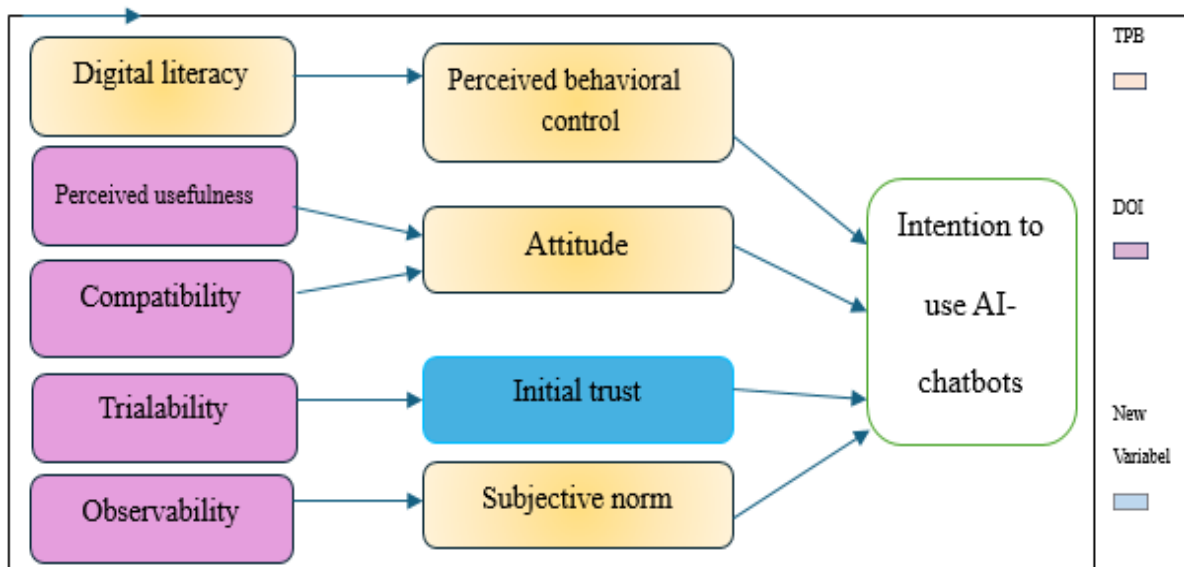

Figure 3: Framework model

METHODOLOGY

Research Design and Paradigm

The present study primarily investigates the effects of the Theory of Planned Behavior (TPB) and Diffusion of Innovations (DOI) factors on users' intention to adopt AI chatbots in tourism. It employs a positivist paradigm, as it involves cause-and-effect reasoning and examines interrelationships among theoretically derived constructs. Following a deductive approach, hypotheses are formulated based on established theory and empirically tested using quantitative data obtained through a structured survey. This approach aligns with prior literature, where the positivist paradigm has been extensively adopted in technology acceptance studies to ensure objectivity, rigor, and generalizability (Hair et al., 2020; Sekaran & Bougie, 2020).

Research Method and Data Collection

A survey research design is used to analyze the hypothesized relationships among study constructs. The decision to employ a survey method is based on both practical and methodological considerations. Objective secondary data quantifying the variables of interest are not readily available in Saudi Arabia. Additionally, the survey approach is cost-effective, time-efficient, and allows greater control over respondent participation (Malhotra, 2010). The study adopts a cross-sectional design, collecting data at a single point in time, which is sufficient for examining relationships rather than temporal trends or pre-post intervention effects. This design is particularly suitable for individual-level behavioral research and for addressing research questions related to adoption intention within a defined timeframe (Hair et al., 2020).

CONCLUSION

This study will demonstrate that the intention to adopt AI chatbots in tourism is shaped by key determinants drawn from the Theory of Planned Behavior (TPB) and the Diffusion of Innovations (DOI). It will apply a positivist paradigm to explain cause-and-effect relationships among these constructs, ensuring a rigorous and objective examination of user behavior. By following a deductive approach, the study will formulate theory-based hypotheses and will validate them using quantitative data collected through a structured survey. Through this process, the research will contribute to the existing body of knowledge by reinforcing the value of positivist, theory-driven methods in producing reliable, generalizable insights into technology adoption in the tourism context.

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