Letting AI make decisions for me: an empirical examination of hotel guests’ acceptance of technology agency

Cristian Morosan
Conrad N. Hilton College of Global Hospitality Leadership, University of Houston, Houston, Texas, USA, and

Ashlan Dursun-Cengizci
College of Tourism, Antalya Bilim University, Antalya, Turkey and
Conrad N. Hilton College of Global Hospitality Leadership, University of Houston, Houston, Texas, USA

Abstract

Purpose – This study aims to examine hotel guests’ acceptance of technology agency – the extent to which they would let artificial intelligence (AI)-based systems make decisions for them when staying in hotels. The examination was conducted through the prism of several antecedents of acceptance of technology agency, including perceived ethics, benefits, risks and convenience orientation.

Design/methodology/approach – A thorough literature review provided the foundation of the structural model, which was tested using confirmatory factor analysis, followed by structural equation modeling. Data were collected from 400 US hotel guests.

Findings – The most important determinant of acceptance of technology agency was perceived ethics, followed by benefits. Risks of using AI-based systems to make decisions for consumers had a negative impact on acceptance of technology agency. In addition, perceived loss of competence and unpredictability had relatively strong impacts on risks.

Research limitations/implications – The results provide a conceptual foundation for research on systems that make decisions for consumers. As AI is increasingly incorporated in the business models of hotel companies to make decisions, ensuring that the decisions are perceived as ethical and beneficial for consumers is critical to increase the utilization of such systems.

Originality/value – Most research on AI in hospitality is either conceptual or focuses on consumers’ intentions to stay in hotels that may be equipped with AI technologies. Occupying a unique position within the literature, this study discusses the first time AI-based systems that make decisions for consumers. The value of this study stems from the examination of the main concept of technology agency, which was never examined in hospitality.

Keywords Artificial intelligence, Decision-making, Information technology, Hospitality, Technology agency

Paper type Research paper

Introduction

Artificial intelligence (AI) has become increasingly integrated into hotels’ technology infrastructure (Gaur et al., 2021). While the literature defines AI broadly, it generally reflects

This study is based on a project supported by The Scientific and Technological Research Council of Turkey (TUBITAK- Project No. 1059B192100499) and the Conrad N. Hilton College of Global Hospitality Leadership, University of Houston.
the simulation of human intelligence by artificial systems to automatically learn and perform human tasks (Aghaei et al., 2012). Most AI has been deployed in contexts characterized by intensive two-way interactions between consumers and technology (Li et al., 2019), but it is making its way into additional managerial areas (Kong et al., 2021). While consumer-AI interactions are conducive of value (Lalicic and Weismayer, 2021), they require continuous input from consumers. Such input is required at critical moments during a consumer’s product experience (e.g. when arriving at the hotel, accessing a guestroom and in time to make foodservice reservations). Facing increasing choices of product customizations that are inherently intangible, hotel consumers are likely to encounter choice difficulty that impacts their cognitive load, which may result in procrastination or other decision deferral behaviors (Sun et al., 2019). These actions may prevent consumers from achieving the “frictionless experiences” that they seek in response to hotel marketing, experiences that hotels strive to design and fulfill.

The rapidly emerging literature on AI applications to services recognizes three distinct applications of AI:

1. providing AI recommendations (Kim, 2020);
2. receiving AI-empowered services (Seytoglu and Ivanov, 2020); and
3. letting AI make decisions for consumers (Yalcin et al., 2022).

While the initial applications of AI for recommendations dominated the initial AI literature, a growing body of literature converged toward the notion that AI recommendations, where consumers only accept system recommendations, improve the value appropriated by consumers (Kim, 2020). As AI and AI-based service models evolved, the literature recognized a distinctive class of services. AI-empowered services offered via robot provided consumers with opportunities for interaction, therefore, facilitating exchanges that improved value (Wu et al., 2022). Along with the development of AI capable of making decisions for consumers, a new stream of research is emerging. This research examines the context in which tasks are delegated to machines, given that the spectrum of tasks capable of being delegated to AI is increasing while consumers’ attitudes and subsequent behavioral changes are still not understood (Bertrandias et al., 2021).

This study focuses on a less examined scope of AI – that of making decisions for consumers. AI can make decisions regarding the automation of legacy tasks and reduce the need for human input and likelihood of error. Such technologies can be deployed to make decisions for consumers in ways that add value, increase personalization and create frictionless experiences. For example, AI can offer unique amenities (Hotellogix, 2022) and make decisions regarding guestroom features (Ting, 2017) and guestroom assignment based on previous preferences (Oracle, 2022). Despite the increasing integration of AI, little is known about consumers’ reliance on AI systems that make decisions for them. This represents a primary research gap. To understand consumers’ motivations to let AI make decisions for them, this study uses the concept of technology agency as a focal construct. Technology agency refers to an intelligent agent’s ability to act independently on behalf of the user (Adams et al., 2022). Yet, to date, the literature does not offer systematic findings that unequivocally explicate how consumers accept technology agency. The literature has only offered sporadic insight into the role of AI in hospitality (Gaur et al., 2021). Thus, addressing this gap would facilitate an understanding of motivational factors leading to consumers’ accepting technology agency.

While the literature offers insight into the use of AI for various tasks, it remains focused on system-specific attributes that may influence intentions to use (Cao et al., 2022). Factors such as performance expectancy or ease of use have been extensively used as predictors of
AI-based systems usage (Ciftci et al., 2021). Yet, scholars called for the utilization of new factors – specific to AI – to explicate consumers’ use of AI (Tussyadiah and Miller, 2019). However, there is no insight into the nature and content of decisions made by AI for hotel consumers, marking a second important research gap. However, a critical consideration in the context of technology agency is the alignment of the decision of an agent with the motivations and belief system of the consumer. Addressing this gap, this study uses the concept of perceived ethics as an antecedent of consumers’ acceptance of technology agency. By focusing on ethics, this study broadens the scope of understanding consumers’ motivational structures that stimulate AI use.

The deployment of AI within agency-related business models creates situations where consumers face benefits-risks tradeoffs regarding their reliance on AI decisions. To capture this tradeoff, this study uses conceptual foundations provided by the agency theory (Lupia, 2001). While the benefits may seem clear due to their manifestation through product attributes, the risks remain unclear. This marks a third research gap. To address this gap, this study investigates two antecedents of risk. Perceived loss of competence reflects consumers’ perceptions of skills loss as they rely on technology for task completion (Bertrandias et al., 2021). Unpredictability reflects the unknown outcomes of decisions facilitated by intelligent agents (Holland Michel, 2020). While scholars used multiple antecedents of risk (e.g. product information, brand familiarity and past experiences) (Napomuceno et al., 2014), such antecedents illustrate conceptual links between various types of risks and their antecedents. Such foundations needed to be adapted to the context of this study. Specifically, perceived loss of competence was included as it reflects consumers’ perceptions of control over task completion, similar to concepts like knowledge learned from past experiences or owed to their characteristics (Mansfred et al., 2016). Likewise, unpredictability was included as it reflects consumers’ lack of knowledge regarding AI decisions akin to product/brand familiarity. The utilization of these two constructs as antecedents of risks offer a nuanced insight into consumers’ acceptance of technology agency offered by AI.

This study takes place in a contemporary hotel context where two significant factors converge to shape the outlook of AI in hotels. First, due to the shortage of staff, consumers may need to rely on information technology to complete tasks or gather information for decisions (Morosan and Bowen, 2022). Second, in the wake of the global pandemic, hotels have increasingly relied on autonomous systems to automate consumer-facing tasks. Against this backdrop, and concurrently addressing the three research gaps, this study’s goal is to explicate consumers’ acceptance of technology agency when facing AI-based decisions in hotels. This study follows two objectives:

1. to clarify the role of perceived ethics in influencing acceptance of technology agency; and
2. to examine the antecedents of perceived risks regarding AI in hotels.

The article is organized as follows: the literature review section explains the theoretical foundation of the study and proposes hypotheses. Subsequently, the methods for instrument design and data collection are explained. Finally, the discussion section interprets the results within the contemporary theoretical and practical context. The article concludes with limitations and future research directions.

Review of literature

Theoretical foundations: technology agency

The hospitality literature has recently recognized the increasing role of AI in the design and delivery of services (Doborjeh et al., 2022). The AI agents have evolved to make decisions...
and act on behalf of the users without human intervention, which led to technology agency (Kennedy and Hidalgo, 2021). Agency reflects the capacity to make decisions and choices, perform actions and take the responsibility for the actions performed. When a technological artifact possesses similar agential capacities, i.e. the ability to simulate human decision-making (Nyholm, 2020) and act independently and proactively on behalf of a human, it reflects technology agency (Adams et al., 2022). Technology agency is a concept that extends naturally from the classic agency theory (Jensen and Meckling, 1976) and can be viewed as a subset of human–computer interaction in which the technology acts and makes decisions for human entities.

The conceptualization of technology agency slightly differs from the earlier conceptualizations of agency from social sciences, where technology had a limited role (Nevo et al., 2016). The classic agency theory recognizes that agents and principals may act alongside divergent interests (Jensen and Meckling, 1976) and use asymmetric information (Bosse and Phillips, 2016). Thus, the main focus of the theory is prescribing the types of agreements between agents and principals that would motivate agents to engage in such agreements in ways that add value (Krafft, 1999). The classic agency theory also recognizes the vulnerability of the principals to moral hazards arising from the agents’ self-interests (Mishra et al., 1998). The agency theory primarily focuses on the costs and benefits of the principal–agent relationship (Candrian and Scherer, 2022; Lupia, 2001). Moreover, the principal may not be able to tell whether the agent’s decision is desired (Stout et al., 2014). The principal may accept the agency based on a cost-benefit analysis, i.e. when the agent’s capabilities are enough to decrease the risks, the principal may delegate the decision-making authority to the agent to get over with limited time, skills or other resources (Candrian and Scherer, 2022).

Over time, the agency theory has provided the conceptual basis and has been adapted to a variety of research contexts where the principal–agent dyad engages in significant interactions to appropriate value (Choi et al., 2018). The adaptations resulted in a new stream of modern research using the concept of agency. Such research retains the main tenet of agency – that the level of control shifts between the principal and the agent as a result of the agreement that guides the principal–agent interactions (Tumbat and Grayson, 2016). Furthermore, the literature documents applications of agency in which agents are willing to engage in interactions with principals where principals recognize and submit to the agent’s authority (Tumbat and Grayson, 2016). However, as technology systems are generally designed to reduce service bottlenecks and assist users in completing tasks, the classic agency theory was adapted to recognize the circumstances of information technology use. For example, an essential circumstance of the classic agency theory – principals and agents having divergent goals – was adapted to recognize the way users delegate tasks to technology systems.

Autonomous AI-based systems have human-like social intelligence and cognitive capabilities, facilitating the acceptance of technology agency (Yu et al., 2021). AI-based agents with autonomous capabilities can process new encounters and learn, evolve and change (Kennedy and Hidalgo, 2021). They can assist users with tasks based on their preferences by automating tasks, processing, monitoring and customizing (Ozdemir et al., 2023). The human can be in, on or off the loop for the decision-making in accordance with the AI-based agent’s level of autonomy. The human is in the loop when s/he is in full control to accept the decisions. When the human is on the loop, s/he can override the decision. If the AI is a fully autonomous system, the human is off the loop, and s/he cannot intervene in the decision (Ivanov, 2022). In this study, the hotel’s AI-based system was defined as a fully autonomous agent that keeps the consumers off the loop while making decisions for them based on the information learned from interactions and preferences.
Technology agency has been used in various contexts, such as social services (Ranerup and Henriksen, 2022), tourism and hospitality (Bulchand-Gidumal, 2020). It is incorporated in many AI solutions, such as autonomous shopping systems (de Bellis and Venkataramani Johar, 2020), revenue management systems (Ivanov, 2022) and intelligent travel agents (Bulchand-Gidumal, 2020). For example, Amer and Alqhtani (2019) examined a Guest’s Smart Agent that decides the access of hotel consumers’ loved ones to the guest room and offers wake-up services. Leonidis et al. (2013) described an Intelligent Hotel Room system that tracks consumers and smart in-room objects for addressing automated laundry, cleaning and room service requests. Users of a fully automated decision-making system are kept off the decision-making process; that is, users have no control over the algorithms, no interaction is needed; thus, there is no need to learn how to use the system (Ivanov, 2022). Essentially, accepting technology agency requires the user to delegate the decision-making to the agent. The concept of delegation, in which one entity (principal) delegates the decision-making authority to another (agent), is notably delineated by the agency theory (Lupia, 2001). Accordingly, in the current study, acceptance of technology agency refers to letting the AI-based system make decisions on behalf of oneself when staying in hotels.

**Extending the theoretical foundations**

Human-to-technology relationships are associated with negotiated exchanges where the costs and benefits shape the principal–agent interaction (Dowling and Nicholson, 2002). Using an AI agent to decide for users can lead to perceived loss of competence of the system users (Bertrandias et al., 2021). Multiple other studies have emphasized benefits and risks as antecedents of technology agency (Ivanov and Umbrello, 2021; Ostrom et al., 2019; Taddeo and Floridi, 2018). This indicates that hotel consumers often struggle to choose between various options for food, entertainment, activities, room amenities, etc. The abundance of alternatives causes the decision-making process to consume energy, time and skills (Tuo et al., 2021). This may cause service bottlenecks as the consumers need to quickly gather information to construct their choice mix (Verma, 2010). In such cases, accepting technology agency provides users with multiple benefits related to decision-making delegation and customized services (Bulchand-Gidumal, 2020).

Accepting technology agency exhibits risks to a certain degree that may lead to unintended and harmful consequences (Taddeo and Floridi, 2018). These risks may derive from the act of delegation (Dowling and Nicholson, 2002) and may relate to accountability (Stout et al., 2014), loss of control (Yu et al., 2021), security and data privacy risks (Ivanov and Umbrello, 2021). Personalized service offerings rely on data exchange between hotels and consumers in every encounter. This might pose possible threats and raise consumers’ concerns about their privacy and misuse of their data (Volchek et al., 2021). Risk perceptions can also be related to the unpredictability of algorithmic decision-making, alongside a “black-box process” (Holland Michel, 2020) and the fear of losing knowledge and competencies (Adams et al., 2022). AI-based systems’ dynamic and evolving nature makes their actions indeterminate and unpredictable over time (Kennedy and Hidalgo, 2021). Thus, consumers give up their sequential decision-making processes, e.g. considering nontangible features and characteristics of the alternatives. When risks increase, the user may avoid delegating the decision-making authority to the agent (Kishishita, 2020).

Delegating decision-making to a human agent is founded on the notion that its actions would adhere to rules of ethics (Dowling and Nicholson, 2002). Because of the opacity of the AI-based decisions (Bulchand-Gidumal, 2020), consumers may question the fairness of AI decisions. Specifically, the developers of the AI-based system may program the algorithms to work in favor of hotels (Ivanov, 2022). Accepting technology agency is considered
convenient as it saves time/effort (Ostrom et al., 2019). Specifically, accepting a dinner reservation made by the AI-based system would diminish consumers’ search costs. Hence, convenience-oriented consumers may find a relative advantage in letting AI make decisions for them. Thus, two additional independent variables were included in the model:

1. perceived ethics of the AI-based system, which refers to considering the agent’s actions as morally acceptable, just and fair (Alimamy and Nadeem, 2021); and

2. convenience orientation, which reflects the extent to which the user prefers to complete tasks in the shortest time with minimum energy (Morganosky, 1986).

The study’s conceptual model is illustrated in Figure 1.

**Hypotheses development**

**Perceived ethics.** Ethics represents a set of principles or guidelines for judging actions as morally good or bad (Siau and Wang, 2020). Delegating decision-making authority to human agents is predicated on the belief that their actions will follow some code of ethics (Dowling and Nicholson, 2002). AI systems that increasingly support or replace human decision-making and judgment have an artificial mind that enables them to make autonomous decisions and behave like human beings (Nath and Sahu, 2020). Therefore, delegating a task to an AI system would raise similar ethical concerns (Dowling and Nicholson, 2002). AI ethics have been increasingly discussed in recent studies (Müller, 2021), including in hospitality (Ivanov and Umbrello, 2021). Hospitality scholars emphasized ethical concerns related to biased algorithms that may arise from human developers’ involvement (Bulchand-Gidumal, 2020) or biased training data sets (Davenport et al., 2020). Additionally, transparency (Siau and Wang, 2020) or opacity (Müller, 2021) of the algorithmic-decision making represents further concerns.

![Figure 1. Proposed structural model](source: Created by authors)
related to the black-box systems’ unpredictability (Reis et al., 2020). Hence, users may avoid delegating tasks or decisions to AI-based systems when they perceive the outcomes of the algorithm as unethical (Mayer et al., 2020).

An AI-based system can be perceived as ethical when its actions are considered morally acceptable, just and fair (Alimamy and Nadeem, 2021). Likewise, perceived ethics in the current study refers to hotel customers’ beliefs that the AI-based system follows a moral code and is fair when making decisions. Studies confirmed that perceived ethics influence behavioral responses toward technology. For instance, Shin (2020) showed that when the AI-based recommendation system followed ethical principles (e.g. fairness, accountability, transparency and explicability), users consider the system more trustworthy and useful. Additionally, Alimamy and Nadeem (2021) validated a positive relationship between the perceived ethics of augmented reality technology and value co-creation intentions. Moreover, multiple studies in the algorithmic bias literature showed that perceived fairness of algorithmic decision-making influences recommendation acceptance, system appreciation and adoption (Kordzadeh and Ghasemaghaei, 2022). Thus, the perceived ethics of an AI-based system may encourage customers to let the intelligent agent make decisions for them. Therefore, the following hypothesis was developed:

**H1.** Consumers’ perceived ethics of hotel AI-based systems positively influence their acceptance of technology agency.

**Perceived benefits.** Perceived benefits reflect beliefs associated with the positive outcomes of technology adoption (Nanggong and Rahmatia, 2019) and are related to the primary system perceptions (e.g. ease of use) (Lien et al., 2019). The benefits of using AI-based systems include tailored hotel experiences that contribute to higher satisfaction levels, enjoyment, time savings and convenience. For instance, Ostrom et al. (2019) summarized the positive outcomes of AI-based system adoption as more personalized services, learning and better time management and, as a result, increased well-being for users. Lalicic and Weismayer (2021) listed the top four reasons for AI-based system adoption as a convenience, ubiquity, personalization and super functionality. Moreover, AI-based systems provide services in a more appealing, engaging and enjoyable manner, increasing users’ value and service quality perceptions (Ivanov and Webster, 2021), as well as adoption intentions (Lin et al., 2020).

In hotels, AI-based systems allow users to find alternatives that help to personalize consumption experiences tailored to their individual preferences. For example, an AI-based system may autonomously enhance the hotel stay experience with personalized room temperature, music and lighting according to the user preferences and daily activities (Bulchand-Gidumal, 2020). Accordingly, perceived benefits are defined in the current study as hotel customers’ beliefs regarding the access of personalized products using AI-based systems for making decisions. AI-based systems that provide the abovementioned benefits may increase the intention to use such technological agents (Ostrom et al., 2019). The literature confirmed that perceived benefits are effective on trust (Park et al. (2019)), value perceptions (Kim, 2020), attitudes (Au and Enderwick, 2000) and intention to adopt systems, including AI-based systems (Kim et al., 2013). Hence, the benefits of an AI-based system may encourage consumers to let the intelligent agent make decisions for them, according to the following hypothesis:

**H2.** Consumers’ perceived benefits of hotel AI-based systems positively influence their acceptance of technology agency.
Perceived risks. Perceived risk is a multifaceted concept (Kansal, 2016) that is context-dependent (Seo and Lee, 2021) and related to a combination of uncertainty and seriousness of outcomes (Bauer, 1960). Research in technology adoption focused on different dimensions of perceived risks (e.g. financial, social, psychological and privacy in Seo and Lee (2021); performance, time and security risk in Kansal (2016)). AI-based systems that are extensively replacing human decision-making are mostly related to ethical risks (Müller, 2021), data privacy and security risks (Ivanov and Umbrello, 2021) and psychological risks (Yoganathan et al., 2021). In the current study, perceived risks refer to hotel customers’ perceptions of uncertainty and seriousness of the outcomes regarding the use of AI-based systems for making decisions.

All new technologies exhibit a certain degree of risks due to their unforeseeable consequences (Morosan, 2010). Hence, users of a new technology may perceive psychological risks when the adoption decision creates uncertainty, discomfort, anxiety (Featherman, 2001), hesitation or negative feelings (Seo and Lee, 2021). For example, AI-based systems designed for task completion and making decisions without user intervention may evoke psychological risk perceptions (Yoganathan et al., 2021). Additionally, a lack of privacy assurance may raise concerns about unethical data usage and privacy because personalized hospitality services depend on a large amount of personal information (Yoganathan et al., 2021). Biased algorithms in self-learning systems may lead to unethical outcomes for users (DeBrusk, 2018). Several studies confirmed that perceived risks negatively influence behavioral intention to adopt new technology (Kansal, 2016). Additionally, the literature on AI-based systems validated a negative relationship between perceived risks and adoption intention of robot restaurants (Seo and Lee, 2021), chatbots (Song et al., 2022) and smart-voice assistants (Cao et al., 2022). Also, increased risk perceptions toward an autonomous decision-making system may decrease the use of such technology (Wiener and Curry, 1980). Thus, risks regarding the use of AI-based systems may discourage hotel customers from letting the intelligent agent make decisions for them. Therefore, the following hypothesis was developed:

H3. Consumers’ perceived risks of hotel AI-based systems negatively influence their acceptance of technology agency.

Perceived loss of competence. Delegating the decision-making responsibility to an AI-based system can be perceived as a loss of competence by users. Mayer et al. (2020) observed that allowing the AI-based system to make decisions caused the users to be fearful of losing their creativity, job-related skills and decision-making abilities. Similar concerns may arise among hotel consumers because of delegating decision-making authority to AI-based systems. Consumers are offered multiple service alternatives (e.g. activities, dining options, room amenities, etc.) with multiple features (e.g. cost, safety, quality, ambiance, etc.). Hotel consumers may incorporate all or any of these factors into their decision-making (Verma, 2010). Delegating such decisions to an AI-based system that keeps the consumers out of the loop may cause consumers to forget how to choose (Wise, 1998), lose awareness of the state and process (Endsley and Kiris, 1995), lose their decision-making abilities and create overdependence (Pelau et al., 2021). Accordingly, in this study, perceived loss of competence refers to the hotel consumers’ concerns about losing habits and skills of making hotel-related decisions and becoming dependent on AI-based systems.

The perceived risks related to perceived loss of competence stem from continued reliance on autonomous systems for specific tasks, such as delegating decision-making to autonomous cars (Bertrandias et al., 2021) or autopilots (Casner et al., 2014). In such contexts, users are concerned about losing their manual skills and proficiencies acquired over time and becoming excessively reliant on technology (Bertrandias et al., 2021). Users’ fear of
losing competence may increase their risk perceptions, and thus, they may avoid using autonomous systems. For instance, Wiener and Curry (1980) revealed that many pilots turned off the autopilot frequently to maintain their manual flying skills because of the fear of losing proficiency. Technologies not only take over tasks and decisions from humans’ hands but also remove them from their minds, resulting in forgetfulness (Wise, 1998). Therefore, AI-based system users may become increasingly addicted to these technologies and associate this overdependence with risks (Vinichenko et al., 2021). Similarly, hotel consumers may be concerned about becoming overly reliant on intelligent agents due to relying on AI-based systems to make hotel-related decisions for them. Thus, perceived loss of competence regarding the use of AI-based systems may increase hotel customers’ risk perceptions, according to the following hypothesis:

**H4.** Consumers’ perceived loss of competence regarding the use of hotel AI-based systems positively influences their perceived risks.

**Perceived unpredictability.** AI-based systems that are extensively replacing human decision-making may cause unintended consequences and risks associated with the complexity and unpredictability of algorithm-based decision-making (Mayer et al., 2020). The unpredictability of an AI-based system (also known as unknowability or cognitive uncontainability) generally refers to the users’ and developers’ inability to anticipate what actions the system will take to generate outputs, even if the main goals of the system are foreknown (Yampolskiy, 2020). This definition reflects the operational unpredictability that all autonomous systems exhibit to a certain degree. Technical unpredictability, on the other hand, relates to the consistency of an AI-based system’s predictive performance (i.e. accuracy). The third context is driven by the interaction of technical and operational unpredictability, which refers to the unanticipated consequences or effects of using an AI-based system (Holland Michel, 2020).

The unpredictability of an AI-based system is often attributed to the opacity of the black-box algorithms in which the inputs and outputs are known, but the process is not. Additionally, the algorithms are changing automatically over time, exacerbating the unforeseen decisions; thus, the accountability of algorithmic decision-making becomes questionable for the users (Mayer et al., 2020). Hence, the lack of understanding of how an AI-based system reaches decisions makes the system “opaque” (Müller, 2021) and poses difficulties for determining how well it functions (Holland Michel, 2020), thus, exacerbating users’ risk perceptions (Pavlou et al., 2007). In this study, perceived unpredictability refers to the fact that hotel consumers cannot accurately predict what decisions will be made by the AI-based system. This uncertainty may influence users’ behavioral responses related to risk tolerance (Kettle and Dow, 2016) and result in higher risk perceptions (Pavlou et al., 2007). Therefore, the following hypothesis was developed:

**H5.** Consumers’ perceptions of unpredictability of hotel AI-based systems positively influences their perceived risks.

**Convenience orientation.** Given that AI-based systems offer more convenience for users, convenience-oriented consumers will be more likely to use them (Marshall and Heslop, 1988). Convenience-oriented consumers are comfort conscious and driven by a desire for less physical and mental effort (Groß, 2019). Hence, convenience-oriented consumers prefer to optimize task completion (e.g. in terms of time and energy) (Morganovsky, 1986) and seek convenient goods and services (Yoon and Kim, 2007). In the context of technology adoption, convenience is a multifaceted construct having three dimensions—time, place and execution. In other words, technology is perceived as convenient when it
makes the user reach the service or product (i.e. execution) without any time and place constraints (Yoon and Kim, 2007). However, convenience orientation is conceptually different from core technology adoption constructs such as usefulness, as convenience orientation reflects the characteristics of the user. In the current study, convenience orientation refers to hotel customers’ desire to make decisions without location and time restrictions.

Perceived convenience was found to be an important decision factor for technology adoption, e.g. in e-commerce (Eastin, 2002), mobile learning (Chang et al., 2012) and online shopping (Raman, 2019). Additionally, previous studies confirmed that convenience orientation positively influences technology adoption (Girard et al., 2003; Marshall and Heslop, 1988). In hotels, AI-based systems that enable users to access personalized benefits and save time are considered convenient technologies (Lalicic and Weismayer, 2021). As consumers increasingly outsource decisions to bots and algorithms, AI-based systems become a convenient choice for them (Klaus and Zaichkowsky, 2022). Thus, convenience-oriented hotel customers may find a relative advantage in letting the intelligent agent make decisions for them. Therefore, the following hypothesis was developed:

\[ H6. \text{ Consumers' convenience orientation positively influences their acceptance of technology agency regarding the use of hotel AI-based systems.} \]

**Methods**

**Instrument development**

As the acceptance of technology agency is still a relatively new concept, the scales were adapted from studies in which such scales have been established with appropriate psychometric properties. The perceived benefits and risks were adapted from the technology adoption literature and measured with three items each. We used an adapted version of the scale of (Xu et al., 2011) used by Morosan and DeFranco (2015). Similarly, the perceived ethics scale was adapted from the e-commerce context and measured with three items that were developed by Roman (2007). The loss of competence scale was adapted from autonomous decision-making literature and measured with three items developed by Bertrandias et al. (2021). Perceived unpredictability was measured using an adapted version of the uncertainty scale of Devaraj et al. (2002) used by Che et al. (2015) in the e-commerce context. The convenience orientation scale was adapted from the technology adoption literature and measured with three items developed by Groß (2019). The acceptance of the technology agency scale was developed based on the logic of Yu et al. (2021), which synthesized the adaptation of the agency theory and its tenets from the multitude of fields where it was applied to technology and hospitality (Mayer et al., 2020; Shaikh and Colarelli O’Connor, 2020; Xu et al., 2022) (Appendix).

The survey instrument included a filtering question, measuring whether the respondents had stayed in a hotel at any time over a period of 24 months prior to the study. The instrument also provided a definition of AI-based systems as an information technology that learns from interactions with consumers and makes decisions based on the information provided by consumers. The respondents were instructed to read a scenario in which they had to imagine that they would stay in a hotel that offers an AI-based system that can make decisions for them. The respondents were directed to imagine that they have arrived at the hotel and were informed that the AI-based system had made a dinner reservation for them at a popular restaurant. The system also chose their room location and set the temperature in the room at their desired level.
The instrument included brief demographic and behavioral questions necessary for the classification of respondents (education, gender and age). The survey was designed to diminish the effects of common method bias by (1) informing the respondents that there are no right or wrong answers, (2) that they can leave the study at any time and by (3) changing the scales’ location within the instrument’s flow (Podsakoff et al., 2003). The instrument was published online using the Qualtrics survey environment and was designed using the principles of responsive Web design so that there are no differences based on the type of devices used by respondents.

Data collection
Data were collected with the help of a major marketing panel company, which has access to panels of consumers. The company has been in practice for over four decades, has access to millions of panelists, is accredited by ESOMAR and GreenBook, and has an A+ rating on better business bureau. The company sends survey invitations to their panelists at the researchers’ request based on fees, which are generally expressed in dollars per complete response. The fee is assessed based on the sample and population characteristics (e.g. size and location). For this study, the general population was represented by adult (18+ years) consumers from the US who have stayed in hotels anytime within 24 months prior to the study. Given the cost per complete respondent and the budgetary constraints of the project, a target sample size was determined to be selected from the above population: 400 complete respondents. The target sample size met the data sufficiency requirements for an analysis of this type, in line with the recommendations of Hair et al. (2009).

The researchers provided the survey link to the marketing panel company, which shared the link with the panelists for completion. A pilot test was conducted with 50 respondents from the same population, after which data collection was paused. Data collected were subject to preliminary analyses (e.g. checking for any problematic items, identifying any question skipping patterns, checking for any technical issues regarding the online survey environment, etc.). Upon confirming that the data were recorded properly and there were no issues with the process of data collection, the data collection continued until the target sample size was achieved. The data collection spanned over three weeks from June to July 2022. After cleaning the data set of records with missing value patterns, a final data set was retained and included 402 respondents.

Results
Demographic and behavioral analyses
A demographic and behavioral profile of respondents was developed. Overall, it was found that the sample conformed to the demographic characteristics of the general population of the US as reflected by the US Census Bureau (U.S. Census, 2013) (Table 1). Specifically, the largest age segment was 60+ years old (20.8%), followed by 30–39-year-old respondents (19.2%). In terms of gender, the sample was relatively evenly divided between males and females. Annual income was also similar to the US population, with 39.6% of respondents reporting incomes between $50,001 and $100,000 per year per household. Most respondents had a bachelor’s degree (37.6%). In reference to travel behavior, most respondents reported that they stayed in hotels 1–2 times a year (41.3%) and generally spend 2–3 nights per stay (63.2%) (Table 2).

Preliminary results
To determine whether the data set was appropriate for analysis, several preliminary analyses were conducted. First, the data set was evaluated in terms of multivariate
normality. This was adopted because most structural equation modeling (SEM) software default to maximum likelihood (ML) estimators that assume that data are multivariate normal. However, data sets with deviations from multivariate normality are common in social sciences (Bandalos, 2014). For this reason, advanced SEM software such as Mplus recommends checking the data for multivariate normality and using estimators that are robust to deviations from multivariate normality whenever the case (Muthén and Muthén, 2017). In this case, an analysis conducted based on Mardia’s coefficients revealed that the data set was not characterized by multivariate normality (Mardia, 1970). As a result, the subsequent SEM used a robust estimate, namely, ML robust in Mplus (Muthén and Muthén, 2017).

### Table 1.
**Demographic profile of respondents**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Categories</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>18–24</td>
<td>14.7</td>
</tr>
<tr>
<td></td>
<td>25–29</td>
<td>9.7</td>
</tr>
<tr>
<td></td>
<td>30–39</td>
<td>19.2</td>
</tr>
<tr>
<td></td>
<td>40–49</td>
<td>18.7</td>
</tr>
<tr>
<td></td>
<td>50–59</td>
<td>16.9</td>
</tr>
<tr>
<td></td>
<td>60 or older</td>
<td>20.8</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>49.8</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>50.0</td>
</tr>
<tr>
<td></td>
<td>Not disclosed</td>
<td>0.02</td>
</tr>
<tr>
<td>Annual income</td>
<td>$50,000 or less</td>
<td>30.8</td>
</tr>
<tr>
<td></td>
<td>$50,001–$100,000</td>
<td>39.6</td>
</tr>
<tr>
<td></td>
<td>$100,001–$150,000</td>
<td>14.5</td>
</tr>
<tr>
<td></td>
<td>$150,001–$200,000</td>
<td>8.8</td>
</tr>
<tr>
<td></td>
<td>$200,001 or more</td>
<td>6.3</td>
</tr>
<tr>
<td>Education</td>
<td>High school</td>
<td>25.1</td>
</tr>
<tr>
<td></td>
<td>Associate degree</td>
<td>17.5</td>
</tr>
<tr>
<td></td>
<td>Bachelor’s degree</td>
<td>37.6</td>
</tr>
<tr>
<td></td>
<td>Master’s degree</td>
<td>15.5</td>
</tr>
<tr>
<td></td>
<td>Doctoral degree</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>1.3</td>
</tr>
</tbody>
</table>

**Source:** Created by authors

### Table 2.
**Behavioral profile of respondents**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Categories</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency of stay</td>
<td>Less than once a year</td>
<td>11.9</td>
</tr>
<tr>
<td></td>
<td>1–2 times a year</td>
<td>41.3</td>
</tr>
<tr>
<td></td>
<td>3–6 times a year</td>
<td>36.6</td>
</tr>
<tr>
<td></td>
<td>7–12 times a year</td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td>More than 12 times a year</td>
<td>2.2</td>
</tr>
<tr>
<td>Length of stay</td>
<td>1 night</td>
<td>10.9</td>
</tr>
<tr>
<td></td>
<td>2–3 nights</td>
<td>63.2</td>
</tr>
<tr>
<td></td>
<td>4–7 nights</td>
<td>24.4</td>
</tr>
<tr>
<td></td>
<td>8–14 nights</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>More than 14 nights</td>
<td>0.3</td>
</tr>
</tbody>
</table>

**Source:** Created by authors
A critical aspect of survey research is potentially nonresponse bias. To check for nonresponse bias, the sample was divided into two groups – early and late respondents – based on the date of their study participation (Ary et al., 1996). Significant differences between the two groups would indicate that early respondents may respond differently than late respondents. An statistical package for social sciences analysis was conducted, and it was found only one item (perceived benefits) showed a minor but significant difference between the two groups ($F = 3.893, p = 0.024$). Given the nature of this difference and the full results of the analysis, it was concluded that this difference may be spurious. Overall, as there are no other significant differences between early and late respondents, nonresponse bias was deemed not problematic in this study.

An aspect of multivariate analysis is the possibility of common method bias. While several measures were taken a priori, a postdata collection analysis was conducted to test for common method bias. Specifically, all items in the instrument were set to load of a single latent factor, and model fit was assessed. The model had a chi-squared of 2,064.402 and 209 degrees of freedom, which corresponds to a normed chi-squared of 9.87. The model’s comparative fit index (CFI) was 0.594, Tucker–Lewis Index (TLI) of 0.551 and root mean squared error of approximation (RMSEA) of 0.150. As the model’s fit was poor, it was concluded that common method bias was not an issue in this data set (Malhotra et al., 2006).

**Measurement model results**

The modeling consisted of two phases. In the first phase, the measurement model’s characteristics were tested using a confirmatory factor analysis (CFA) (Hair et al., 2009). The Mplus software version 8.0 was used in the analysis (Muthén and Muthén, 2017). During the initial modeling, one item exhibited a low loading. The item with low loading reflected respondents’ preferences to make decisions without location and time restrictions. Its removal did not damage the ability of the scale to properly measure the latent construct, as the remaining items measured the critical aspect of convenience orientation, in line with the established conceptualization and operationalization of the construct (Roh and Park, 2019). Therefore, it was removed from the analysis, and the model was specified. The respecified model was characterized by appropriate fit, with a chi-squared of 370.279 and 188 degrees of freedom, which corresponds to a normed chi-squared of 1.97. Also, several absolute and relative fit indexes were examined, as follows: CFI of 0.960, TLI of 0.951 and RMSEA of 0.050. With the model showing appropriate fit, it was concluded that it was appropriate for further analysis (Toh et al., 2006).

The next analyses facilitated the examination of reliability and validity (Tables 3 and 4). Reliability was measured using the squared loadings from each item obtained from the CFA. Item loadings were subsequently used in the calculation of composite construct reliability (CCR) values for each latent construct. All CCR were above the commonly accepted value of 0.8, which indicated appropriate reliability (Hair et al., 2009). Two critical aspects of validity were examined: convergent and discriminant validity. Convergent validity was examined using the factor loadings from the CFA and the calculated average variance extracted (AVE) values for each latent construct. All the factor loadings exceeded 0.7 except for one (0.674), which was kept in the analysis due to its closeness to 0.7 (Chen and Tsai, 2007). In addition, the AVE values for each latent construct exceeded 0.5. Thus, it was concluded that this instrument has appropriate convergent validity. To test for discriminant validity, a procedure recommended by Fornell and Larcker (1981) was used. It required a comparison between the AVE values for each latent construct and the squared inter-construct correlations.

Discriminant validity is established when the squared correlation between any two constructs is lower than the AVE values corresponding to those two constructs. In this
All squared correlations were lower than their corresponding AVE values, which indicated the appropriate discriminant validity (Hair et al., 2009). In addition, the correlations between perceived ethics and benefits were close to the correlations between benefits and acceptance of technology agency and the AVE value for benefits (Table 4). While the AVE scores exceeded the squared correlations between these constructs, two Heterotrait-Monotrait (HTMT) analyses were conducted to confirm discriminant validity between perceived ethics and benefits, and acceptance of technology agency and benefits (Henseler et al., 2015). The analyses found HTMT ratios of 0.725 and 0.754, respectively, which were lower than the accepted threshold of 0.9 (Teo et al., 2008). These results indicate that discriminant validity was established in this study.

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Items</th>
<th>Loadings</th>
<th>Loadings-squared</th>
<th>Composite reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived ethics</td>
<td>1</td>
<td>0.899</td>
<td>0.808</td>
<td>0.856</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0.881</td>
<td>0.776</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>0.751</td>
<td>0.564</td>
<td></td>
</tr>
<tr>
<td>Perceived benefits</td>
<td>1</td>
<td>0.715</td>
<td>0.511</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0.821</td>
<td>0.674</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>0.891</td>
<td>0.794</td>
<td></td>
</tr>
<tr>
<td>Perceived risks</td>
<td>1</td>
<td>0.807</td>
<td>0.651</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0.864</td>
<td>0.746</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>0.786</td>
<td>0.618</td>
<td></td>
</tr>
<tr>
<td>Perceived loss of competence</td>
<td>1</td>
<td>0.734</td>
<td>0.539</td>
<td>0.822</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0.674</td>
<td>0.454</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>0.794</td>
<td>0.630</td>
<td></td>
</tr>
<tr>
<td>Perceived unpredictability</td>
<td>1</td>
<td>0.846</td>
<td>0.716</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0.809</td>
<td>0.654</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>0.785</td>
<td>0.616</td>
<td></td>
</tr>
<tr>
<td>Convenience orientation</td>
<td>1</td>
<td>0.723</td>
<td>0.523</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0.913</td>
<td>0.834</td>
<td></td>
</tr>
<tr>
<td>Acceptance of technology agency</td>
<td>1</td>
<td>0.918</td>
<td>0.843</td>
<td>0.961</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0.919</td>
<td>0.845</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>0.939</td>
<td>0.882</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>0.933</td>
<td>0.870</td>
<td></td>
</tr>
</tbody>
</table>

**Source:** Created by authors

<table>
<thead>
<tr>
<th>Constructs</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived ethics</td>
<td>0.716</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived benefits</td>
<td>0.596</td>
<td>0.660</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived risks</td>
<td>0.247</td>
<td>0.207</td>
<td>0.672</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived loss of competence</td>
<td>0.017</td>
<td>0.005</td>
<td>0.292</td>
<td>0.536</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived unpredictability</td>
<td>0.151</td>
<td>0.101</td>
<td>0.207</td>
<td>0.026</td>
<td>0.662</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Convenience orientation</td>
<td>0.021</td>
<td>0.021</td>
<td>0.001</td>
<td>0.028</td>
<td>0.001</td>
<td>0.678</td>
<td></td>
</tr>
<tr>
<td>Acceptance of technology agency</td>
<td>0.612</td>
<td>0.567</td>
<td>0.353</td>
<td>0.020</td>
<td>0.162</td>
<td>0.036</td>
<td>0.860</td>
</tr>
</tbody>
</table>

**Notes:** The values on the diagonal (Italic) represent the AVE values of the latent variables. The values under the diagonal represent the squared inter-latent construct correlations

**Source:** Created by authors
Structural model results

The structural model showed good fit based on several absolute and relative indexes (Figure 2). The chi-square was 420.613, with 193 degrees of freedom, corresponding to a normed chi-square of 2.18. The CFI was 0.950, TLI was 0.940 and the RMSEA was 0.055. Overall, all the hypothesized relationships were confirmed in their predicted direction, which illustrates that this model is appropriate for the examination of hotel guests’ acceptance of technology agency.

Four constructs were identified as significant antecedents of acceptance of technology agency. Perceived ethics was found to be the strongest ($\gamma = 0.420, p < 0.001$). This provides support for hypothesis $H1$. That means that the consumers’ perceptions of the way in which the AI systems make the decisions for consumers are instrumental to their reliance on AI for such decisions. Not surprisingly, benefits were found to be strong predictors of acceptance of technology agency ($\gamma = 0.335, p < 0.001$), therefore, validating hypothesis $H2$. That is, AI systems that are perceived to be beneficial by hotel guests are likely to be accepted by consumers for their ability to make decisions.

In contrast, risks were found to negatively influence acceptance of technology agency, which validates hypothesis $H3$. The impact of risks ($\beta = -0.270, p < 0.001$) was lower than that of benefits, which may indicate that consumers may be overlooking the risks when considering allowing AI systems to make decisions for them in hotels. Not surprisingly, perceived loss of competence and unpredictability had relatively strong and significant impacts on risks, therefore, validating hypotheses $H4$ ($\gamma = 0.480, p < 0.001$) and $H5$ ($\gamma = 0.400; p < 0.001$). That is, consumers perceptions that they would lose their competence by allowing AI to make decisions for them, and the unpredictable aspects of utilization of such systems increase the perceived risks associated with such systems in hotels. Finally, convenience orientation was found to be the weakest antecedent of acceptance of technology agency ($\gamma = 0.099, p < 0.05$), thus validating hypothesis $H6$. That is, consumers who are oriented toward convenience may still rely on AI systems to make decisions for them, but that relationship is not strong.

![Figure 2. Structural model results](image_url)
Discussion
This study sought to validate a conceptual model that explains acceptance of technology agency regarding AI-based systems in hotels. The model was empirically validated, and the hypotheses were supported, allowing for the discussion of several key findings. The model focused on the concept of technology agency related to hotel tasks. This result is critical as the hotel industry, facing structural challenges, is increasing its reliance on AI-based systems that make decisions for consumers. While this concept has never been studied in the hospitality literature, it aligns with other notable academic findings, which together support the thesis that hotel consumers are likely to adopt AI-based systems in hotels for consumer-facing tasks.

The first objective of this study was to examine the role of perceived ethics in influencing acceptance of technology agency. Perceived ethics was found to be the most important predictor of acceptance of technology agency. This result aligns with the recent literature, which found that perceived ethics are key predictors of consumers’ behavioral responses (Shin, 2020) including intentions to adopt AI-based systems (Kordzadeh and Ghasemaghb, 2022), and such relationships are generally of higher magnitude (e.g. $\beta = 0.47$) (Alimamy and Nadeem, 2021). This result can be explained by the fact that the consumers believe that making decisions allowing AI-based systems to make decisions for them should be in line with their own ethical beliefs. This result is notable because it reflects qualitative evaluation of decisions delegated to AI-based agents. This represents a significant step forward in the continuous debate that characterizes the ethical environment of AI-based decision-making. Moreover, this finding taps into consumers’ perceptions regarding decisions that are made on their behalf but also reflect the algorithmic vision of hotels. Ideally, such interests converge toward providing a seamless experience to the consumers, but it is possible that some level of divergence may occur in situations where consumers’ and hotels’ goals are not aligned.

Another key finding is that both benefits and risks are significant antecedents of acceptance of technology agency. These findings are consistent with the previous AI adoption literature (Cao et al., 2022; Kim et al., 2013). Given the theoretical foundation of this study, the conceptualization of benefits-risks regarding the use of AI-based systems positions this study uniquely relative to the recent literature, as it recognizes the calculative processes leading to consumers’ decisions to accept AI-based decisions. Notably, benefits were found to be a slightly stronger predictor of acceptance of technology agency than risks. That is, consumers could be slightly overlooking the risks of using AI-based systems when the benefits are clear. This result stands out from the recent literature, where benefits have much stronger impacts than risks on outcome variables, such as technology adoption or willingness to disclose personal information (Morosan, 2018). In addition, this result seems to indicate that the consumers focus their acceptance of technology agency decisions on the benefits rather than the risks.

The second objective of this study was the incorporation within the conceptual model of two antecedents of risks: perceived loss of competence and unpredictability. While this result was validated for the first time in the hospitality literature, it aligns with the logic of existing research outside hospitality (Mayer et al., 2020). However, while a significant relationship is expected between perceived loss of competence and risks, the previously empirically validated results reflect settings characterized by deeper competence in task completion (e.g. piloting an aircraft) (Casner et al., 2014). These results are explicable by the fact that regardless of the level of competence necessary to complete a task (e.g. making a dinner reservation, adjusting the ambiental settings in the guestroom), consumers relying on automation would eventually try heuristic approaches to task completion when such
opportunities occur and that ultimately utilization of intelligent systems affects their control over their digital selves (Schweitzer et al., 2019). Furthermore, users with high perceptions of competence loss could overemphasize the “black-box” logic of AI decision-making, which results in a more acute appraisal of risks. This could be attributable to the incipient phases of deployment of AI technologies, postpandemic changes and the resulting higher reliance on automation to address consumers’ service delivery and mitigate staff shortages. Through these results, this study expands the logic of previous findings to tasks of relatively lower levels of competence, such as hotel tasks (e.g. making a dinner reservation). These results are also interesting when considering the asymmetries of information that characterize hotel services, especially postpandemic.

The significant and relatively strong effect of unpredictability on risks is not surprising in accordance with the related literature (Pavlou et al., 2007). This finding reflects the logic that the complexity of AI-system decision-making could be difficult to understand by consumers, which can result in a sense of unpredictability. Therefore, the decisions may seem unpredictable relative to decisions that may be made directly by the consumers (Mayer et al., 2020). Furthermore, as unpredictability reflects the blend between consumers’ feeling of uncertainty related to the AI-based system decisions, corroborated with the inherent risks associated with intelligent agents’ completion of tasks, this finding emphasizes that consumers may be willing to engage in using such systems but eventually understand that there is risk involved. This finding has essential ramifications for the use of AI in hotels toward specific tasks, as generally, the decisions that are facilitated by AI-based systems represent sub-decisions of the overall hotel experience. As hotel consumers are generally forgiving with respect to errors made by service robots, the risk associated with acceptance of technology agency of specific sub-decisions in hotels may be relatively easily mitigated by the hospitable nature of a hotel stay.

Finally, the low magnitude of the relationship between convenience orientation and acceptance of technology agency is surprising and contrasts the technology adoption literature (Marshall and Heslop (1988)). For example, Lalicic and Weismayer (2021) found that convenience is a major reason for consumers’ use of chatbots in travel planning. Yet, in this study, regardless of level of consumers’ convenience orientation, their acceptance of technology agency remains slightly unchanged. This could be attributable to the fact that acceptance of technology agency of AI-based systems may appeal not only to consumers who are seeking convenience but also to a broader range of consumers. Additionally, this finding could be attributed to the fact that the utilization of AI-based agents is relatively simple in hotels and does not require new skills to be learned specifically for their utilization, which would differentiate between consumers ranging in their convenience orientation from high to low. Finally, the AI-based decisions may be viewed similarly to the rest of decisions pertaining to a hotel stay in terms of convenience, as the hotel stay environment is by default characterized by offering convenience to consumers as a primary attribute of a successful stay.

Implications

Theoretical implications

This study brings several important theoretical implications due to the typology of the constructs used in the development of the conceptual model and the technology-task dyad examined in this study. This study is the first in hospitality to use the concept of acceptance of technology agency regarding the use of AI-based systems in hotels. While acceptance of technology agency has been studied before in areas outside of hospitality, the hospitality literature is characterized mostly by research on the performance of AI (Chen et al., 2022),
consumers’ evaluations of consumer-system interactions (Mariani and Borghi, 2021) and systematic review studies (Mariani and Wirtz, 2023). Occupying a unique position within this growing literature, this study addresses an essential drawback – that of lack of research examining the determinants of AI technology acceptance (Kong et al., 2022). Thus, by offering initial insight into the determinants and the overall process of acceptance of technology agency regarding AI-based decision-making in hotels, this study opens a new area for research in hospitality. Specifically, it stays at the foundation of research that examines the way consumers accept a novel, relatively more extensive role of AI, that goes beyond recommendations or simple interactions.

This study captures the advancements in business models that use advanced systems that can revolutionize the way consumers and intelligent systems interact within the framework of a hotel experience. As AI becomes better equipped to make decisions for consumers instead of merely helping, examining the way consumers accept decisions made by systems that are capable of minimizing error, increase value and contribute to a frictionless hospitality experience becomes a research priority. This is critical for designing new theoretical frameworks that can inform academic and corporate research and development, which leads to fostering innovation within the growing entrepreneurial hospitality sector (Filieri et al., 2021).

The results of this study advance the agency theory. As the theory primarily focuses on the motivations and the engagement pertaining to the principal–agent relationship, this study underscores the more important impact of the benefits (relative to risks) in users’ acceptance of technology agency. This aspect is critical, given that risks that are generally mitigated when the principal anticipates the agent’s actions remain high in hotel AI-based services due to the black-box algorithmic decision-making processes. Thus, the examination of agency within this context has implications for understanding acceptance of technology agency decisions in other similar contexts dominated by “black-box” systems, such as super-AI or quantum computing. In addition, this study augments the conceptual reach of agency theory and its modern technology-oriented adaptations to transient service contexts, which are not dominated by the same longer-term commitment between agents and principals as initially recognized by theory. Because the role of hotel technology is to assist consumers to build the servicescape within the limited time frame of a transient encounter, providing insight into the relative shorter-term acceptance of agency advances our current understanding of the way the alignment of interests, information asymmetry and expected performance are negotiated by service consumers.

A substantial theoretical contribution is the utilization of the perceived ethics construct. As the technology infrastructure of hotels is increasingly made up of systems that are capable of incorporate data-based learning into decisions, scholars have increasingly called for the examination of ethics regarding autonomous systems (Ivanov and Umbrello, 2021). This is paramount given the “black-box” aspect of AI decision-making and the design of algorithms, which may lead to biased outcomes (Jobin et al., 2020). This study highlights that perceptions of ethics are critical aspects that act as catalysts and shape consumers’ decisions in situations where the benefit-risk dyad is ambiguous. Accordingly, this study provides the conceptual link between agency theory and ethics, and thus, extends the conceptual space of the agency theory, permitting a comprehensive examination of technology agency in business contexts dominated by opaque technologies superimposed on intangible services. Therefore, recognizing perceived ethics as a strong conceptual antecedent of acceptance of technology agency in hotels implies that guests’ acceptance of technology agency is considerably shaped by their motivational schemas. Furthermore, while ethics-related constructs have been integrated within classic technology adoption...
models (Saurabh et al., 2022), this study illustrated how ethics can be used to expand the conceptual scope of models explaining the decision-making ability of autonomous systems. Thus, this study advances the information systems literature as it departs from its traditional focus on system perceptions or consumer characteristics.

While this study relied on a conceptual tradeoff between benefits and risks, it provides novel insight into other possible factors affecting the risks of acceptance of technology agency in hotels. While perceived loss of competence has been studied in well-defined technical contexts such as aircraft piloting, its utilization in service contexts provides a new conceptual foundation for research into the role of AI-based agents in facilitating human tasks in services. This is a significant advancement for the services literature, as services, especially hotel services, are basing their entire business models on staff members always being available to address consumers’ needs. During this process, staff members can learn and eventually incorporate that learning into the delivery of services to the consumers. Such models also facilitate consumers’ learning of information necessary for task completion (e.g. how to connect to a streaming service using the in-room TV). The utilization of both perceived loss of competency and unpredictability as antecedents of risks reflects two complementary aspects of risk:

1. the way consumers perceive their roles in making decisions when technology is available; and
2. the consequences of stepping away from the decision and allowing AI-based agents to decide.

Managerial implications

As the hotel industry is continuously developing its technology infrastructure, it is important to recognize a few implications for managerial practice. First, this study underlines the importance of acceptance of technology agency for hotel consumers. The findings suggest that hotel consumers are ready to use such systems for decision-making. Therefore, to enhance the potential outcomes of acceptance of technology agency, hotels can confidently deploy them going forward. This approach may create disruptions of the traditional business models, in which consumers were given control of their preferences. Hospitality information technology vendors are already working on solutions that would involve AI-based agents capable of making decisions for consumers, such as automatic assignment of rooms and pushing information about consumer preferences to multiple touchpoints. Following this trend, an increasing number of hotels are initiating communication with guests prior to their arrival, which could represent an opportunity for hotels to learn about preferences. In such cases, these data can be used in AI decision-making. Thus, relying on such technologies and engaging in novel business models, hotels can provide frictionless service. Consumers can benefit from services that are designed based on their preferences without necessarily having to make decisions or explicitly expressing those preferences. To promote such services, hotels can communicate their utilization of AI-based business models using a variety of marketing strategies. Such strategies may be aimed at early adopters to stimulate exploratory use and may portray the ways hotels build competitive advantages by simplifying consumers’ access and fulfillment of services on the property.

Recognizing that consumers facing such technologies engage in a benefit-risk tradeoff suggests that hotels need to engage in clear communication regarding the benefits of acceptance of technology agency. One specific way in which this can be done is to provide a clear explanation of the decisions that could be made by AI-based agents, the information
required for decision-making and the likely expected outcomes (e.g. satisfaction, conversion and retention). Additionally, hotels can provide assurance to the guests that decisions made by AI-based agents via acceptance of technology agency can be reversed by providing services facilitated by staff.

Consumers’ interpretation of AI-based decisions is important (Yalcin et al., 2022); therefore, hotels can choose how to communicate the way in which service decisions are being made for consumers. Any new technologies added to the service portfolio are deployed to add value to the service stakeholders, so the consumers’ reactions to AI decisions may be nuanced based on the characteristics of services and decisions. Promoting the benefits of AI decisions could represent a strong foundation of the communication strategy of hotels. A characteristic of acceptance of technology agency is delegating decisions that commit the users to additional financial commitments, such as accepting dinner reservations for restaurants that have cover charges. Opt-out mechanisms for consumers to cancel reservations without penalty could add tremendous value for all stakeholders. Hotels should also develop communication procedures that inform the consumers that such decisions are associated with possible extra charges.

The implications of this study extend from the hotel industry to other travel verticals. For example, travel agencies promoting tour packages for consumers who visit a destination for the first time can emphasize the ethical design of the AI-based systems and the benefits that consumers can accrue. This can detangibilize the entire travel experience, reduce consumers’ information searches and ultimately increase the value of travel. Similarly, such systems can be deployed in foodservice, especially in online food delivery systems. For example, consumers may be indecisive regarding menu choices or participate in events in which they have difficulty choosing the details. Marketers that emphasize the way AI-based systems optimize the decision-making processes can make consumers more confident in relying on AI-based systems.

This study also has implications spanning to other geographical settings, affecting the global travel industry. As the industry is facing increasing consolidation and multiple systems can now seamlessly interface, understanding the factors that lead to acceptance of technology agency in one industry allows other connected industries to design products that take advantage of consumers’ use of AI-systems. Specifically, systems that are used in hotels can seamlessly adopted by airlines, foodservice, car rental or local attractions, to ultimately create the integrated and frictionless travel experience that all consumers seek. Such integration can increase the benefits and ethical decision-making capabilities of AI. This is because the data necessary for such systems’ self-learning is continuously increasing in magnitude, scope, speed and accuracy.

**Limitations and further directions**

Consistent with studies in social sciences, this study has several limitations. Thus, the results of this study should not be disassociated from its context. A first limitation lies in this study’s location in the US. While the US hotel industry has witnessed several key changes related to the deployment of AI-based systems, not all the hotels benefit from the same access to technology. Furthermore, given the heterogeneity of US hotel services, there could be differences in terms of hotel infrastructure, system integration, brand restrictions or qualified staff availability. To address this limitation, future research should examine segmented markets.

The second limitation is based on the fact that this study was conducted with consumers in the US American consumers have access to a multitude of technologies in their daily lives, including AI-based agents. They are generally proficient in the utilization of such systems in
various contexts. To address this limitation and increase the external validity of future studies, researchers should focus on international samples of consumers who have access to various AI-based technologies.

Third, the data was collected in 2022, while the effects of the COVID-19 pandemic closures might have been lingering. To overcome this limitation, future research could engage in longitudinal research. Finally, to maintain parsimony and reflect the reality of the hotel industry, this study only included two antecedents of risks. Future research should incorporate additional constructs in conceptual models. For example, constructs such as consumers’ characteristics, their experience using AI-based systems and familiarity with products and decisions being facilitated by AI could provide a more accurate illustration of the mechanisms by which consumers form their perceptions of risk associated with AI and should be included in conceptual models. Further research can study the effects of automating certain legacy processes that currently lead to consumer dissatisfaction, such as manually assigning rooms to consumers. This process would generate in-depth insight into the deployment of manual and automatic task completion processes in services.

References


Appendix. Constructs and measurement items
Please read the following scenario before you begin the survey.

Imagine that you are about to stay in a hotel that offers an artificial intelligence (AI)-based system that can make decisions for consumers. Imagine that you have arrived at the hotel and you receive a message informing you that the AI-based system has made a dinner reservation for you at a popular restaurant. The system also chose your room location for you and set the temperature in the room at your desired level.

Constructs and items:

1. Perceived ethics.
   - I consider the hotel's AI-based system to be ethical when making decisions for consumers like me.
   - I consider the hotel's AI-based system to be fair when making decisions for consumers like me.
   - I think that the hotel's AI-based system follows a moral code when making decisions for consumers like me.

2. Perceived benefits.
   - The AI-based system for making decisions reduces my searching time to access the personalized services/products that I need.
   - The AI-based system for making decisions can provide me with the convenience to instantly access the personalized services/products that I need.
   - Overall, I feel that using the AI-based system for making decisions for consumers is beneficial to access personalized services/products.

3. Perceived risks.
   - Using AI-based systems for making decisions for consumers in hotels would involve many unexpected problems.
   - It would be risky to use AI-based systems for making decisions for consumers in hotels.
   - There would be high potential for loss in using AI-based systems for making decisions for consumers in hotels.

4. Perceived loss of competence.
   - With an AI-based system that makes decisions for consumers, I think that I will lose the habit of making hotel-related decisions.
   - If I use an AI-based system for making decisions, I will become dependent on this technology.
   - In the long run, I fear losing my hotel-related decision-making skills because of the AI-based system that makes decisions for consumers.
   - In the long run, the AI-based system that makes decisions for consumers will make me feel like I am not thinking.

5. Perceived unpredictability.
   - I cannot predict what decisions will be made by the AI-based system when staying in hotels.
   - I do not know what decisions will be made for me by the AI-based system next time when I stay in a hotel.
   - It is difficult for me to know what decisions will be made by the AI-based system beforehand.
Convenience orientation.
- I try to make my decisions as quickly as possible.
- I always want to make my decisions in a short amount of time.

Acceptance of technology agency.
- I would be comfortable letting an AI-based system to make decisions for me when staying in hotels.
- I would let an AI-based system to make decisions for me when staying in hotels.
- I would trust an AI-based system to make decisions for me when staying in hotels.
- I would be confident in an AI-based system to make decisions for me when staying in hotels.

Source: Created by authors

Corresponding author
Cristian Morosan can be contacted at: cmorosan@uh.edu

For instructions on how to order reprints of this article, please visit our website: www.emeraldgrouppublishing.com/licensing/reprints.htm
Or contact us for further details: permissions@emeraldinsight.com