Travel and Tourism Research Association: Advancing Tourism Research Globally

Trust Building for Autonomous Service Robots in Hotels

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Lin, Boyu and Lee, Woojin, "Trust Building for Autonomous Service Robots in Hotels" (2021). *Travel and Tourism Research Association: Advancing Tourism Research Globally*. 9.
https://scholarworks.umass.edu/ttra/2021/grad_colloquium/9

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Introduction

Artificial intelligence (AI) and autonomous service robots have been used in the hospitality industry, such as a concierge robot in the Hilton and a room service delivery robot in the Savioke Hotel (Jong, 2017). There are both positive and negative views of autonomous service robots. These innovative applications provide a solution to labor shortages, optimize costs, create unique experiences of customers, ensure consistent service quality, and expand service capacity (Bowen & Morosan, 2018; Ivanov & Webster, 2017; Tussyadiah, 2020). However, customers may have feelings of anxiety or even fear about engaging with robots, owing to the loss of human contact and the lack of knowledge or prior experience of these robots (Bowen & Morosan, 2018; Tussyadiah, 2020). Therefore, it is essential to convince customers to build trust and adopt these innovations.

Moreover, the coronavirus disease (COVID-19) has brought serious challenges for hotels; and hoteliers need to consider ways to protect their customers and frontline workers from infection during this period by implementing social distancing. Therefore, an increasing number of hotels are adopting autonomous service robots as effective tools to provide services to guests with a high level of physical social distance (Seyitoglu & Ivanov, 2020). As guests have more opportunities to interact with these innovative robots, there is a growing need to identify the factors that affect the users' initial trust and their willingness to utilize the innovative services especially in the post-pandemic age. By integrating the initial trust model (ITM; McKnight et al, 1998) with the unified theory of acceptance and usage of technology model (UTAUT; Venkatesh et al., 2003), this study aims to 1) explore the decisive factors in consumers' intentions to adopt autonomous service robots in hotels, and 2) examine the impact of the moderating role of familiarity between four constructs of the UTAUT and the initial trust in terms of these new services. The twofold contributions of this study are as follows. Most studies examine trust belief as an exogenous variable that affects intention to adopt (Turja, et al., 2020), but this paper emphasizes initial trust as a mediator variable between the four constructs of the UTAUT and the intention to adopt. Besides, this study highlights the importance of the initial stage of trust-building from the customers' perspective. As most guests have no previous experiences of these innovations, initial trust is dramatically critical when making the decision to continuously adopt these novel services.

Literature Review

2.1 Service Robots

Service robots are system-based autonomous and adaptable interfaces that interact with and deliver services to customers (Wirtz et al., 2018). Autonomous service robots can provide unique customers' experiences and homogenous service quality, whereas employee service emphasizes emotional responses and heterogeneity of service (Wirtz et al., 2018). During the pandemic, many hotels have adopted service robots to enable social distance and reduce opportunities for infection, such as robot bartenders, robot concierges and delivery robots. The threat of coronavirus has made people more alert to cleanliness and the associated risks of human contact; hence the outbreak of COVID-19 has accelerated the penetration of new technologies into the hospitality industry (Jiang & Wen, 2020). As customers are increasingly exposed to service robots, it is vital to identify whether customers will trust these new types of services even after the period of COVID-19.

2.2 Initial Trust Model (ITM)

Early studies of trust focused on its impact on personal behaviors in interpersonal relationships (Mayer et al., 1995). Trust-building is a dynamic process that begins with initial trust and moves through continuous trust-development, with various determinants in the different phases (Siau & Wang, 2018). Research has shown that initial trust is critical when those with little or no prior experience of an innovative service make a decision on whether to utilize it (Kim et al., 2009; Kim & Prabhakar, 2004). Since few hotels have adopted autonomous service robots and most people had no direct experience of them, the initial trust of service robots is dramatically crucial to form a first attitude, continuous trust-development and further adoption (Siau & Wang, 2018). Initial trust is defined as a willingness to meet the individual demands without prior experience (Kim & Prabhakar, 2004). Referring to the Initial Trust Model (ITM), McKnight et al. (1998) conceptualized three forces that affect initial trust: institutional, personal and environmental factors. These factors will be measured to assess consumers' initial trust of the innovative technology services. Given the increasing use of these new innovative services in the hospitality industry, the current study will focus on the initial stage of trust-building and examine how initial trust affects the intention to adopt autonomous service robots in hotels especially in the forthcoming post-pandemic era.

2.3 Unified Theory of Acceptance and Use of Technology (UTAUT)

The unified theory of acceptance and use of technology (UTAUT) is a hybrid model that integrates several theories, such as the technology acceptance model, social cognitive theory, motivational model, and innovation diffusion theory (Venkatesh et al., 2003). The UTAUT has been widely used to explain technology acceptance behavior, applying four key exogenous variables (i.e., performance expectancy, effort expectancy, social influence, and facility condition) and two endogenous variables (i.e., intention to use technology and use behavior; Venkatesh et al., 2003). In this study, the UTAUT is integrated with the ITM to comprise the conceptual framework while identifying the mediator role of the initial trust of the customers in relation to the adoption of the autonomous service robots offered by hotel and proving the moderating role of familiarity between the four exogenous variables in the UTAUT and the initial trust of these services. The hypothesized model is shown in the figure 1.
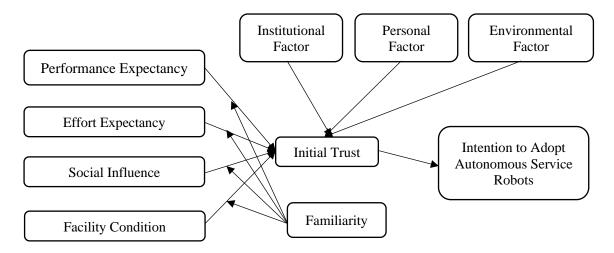

Figure 1 Hypothesized Model

2.4 Familiarity

Familiarity refers to the degree of understanding and knowledge of a particular subject, which has been examined to affect trust (Idemudia & Raisinghani, 2014). In terms of autonomous service robots, individuals have the different levels of familiarity, which may result in different degrees of initial trust when interacting with these services. For example, some customers may have limited knowledge of autonomous service robots, while others may understand how they are operated and maintained. Familiarity can increase trust or distrust, depending on whether the prior experiences were positive or negative (Alraja, et al., 2019). Past experience has been found to be a significant moderator variable in the UTAUT (Venkatesh et al., 2003). Hence, the concept of familiarity will be applied as a moderator in this study and measured to examine its impact on the relationships between the four constructs of UTAUT and the initial trust of these innovative services.

Proposed Methodology

Data for this study will be collected using a mixed method approach. First, a qualitative study will be conducted, comprising interviews with individuals who may or may not have direct interaction with autonomous service robots in hotels. Approximately 10-12 interviewees will be recruited, with the sample diversified by the snowball sampling. Each interview will last between 30 and 45 minutes. The participants will meet the following criteria: they will have previously stayed in hotels as customers and be willing to participate in an interview. The participants will watch a short video about different service robots in hotels, and then they will discuss around 10 guiding questions. Based on the findings of literature review on the UTAUT and ITM, the questions will focus on the four constructs of the UTAUT, and the following phase of the questions will relate to initial trust and familiarity in the context of autonomous hotel-service robots. The qualitative data will be analyzed via thematic analysis to identify the quantitative survey instrument and to develop measurement scales that fit the conceptual framework. In addition, a pilot survey will be conducted with 50 samples to test the validity of the measurements. After the process of item reduction, a quantitative survey will be distributed to at least 300 participants selected by Amazon Mechanical Turk. The data will be analyzed using the structural equation model.

Expected Results and Implications

The mixed method will be applied to investigate the expected results, 1) four exogenous variables of the UTAUT and three factors of ITM have distinctive effects on initial trust, which contributes to the intention to adopt autonomous service robots in hotels; 2) the familiarity with the autonomous service robots moderates the relationship between the four constructs in UTAUT and initial trust.

In terms of its theoretical implications, this study will extend the literature on the adoption of autonomous hotel-service robots from customers' angle, combining the UTAUT with the ITM. The mediating effect of initial trust and the moderated role of familiarity will be emphasized. In practical terms, this study will provide valuable insights for hotel managers who are seeking to identify customers' initial trust and willingness to utilize the autonomous robot services in the hotel industry. The findings will guide hotel managers on robot service implementation and the potential marketing strategies to invest in service robots after the pandemic.

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