International Journal of Hospitality Management 75 (2018) 105–115

Contents lists available at ScienceDirect

International Journal of Hospitality Management

journal homepage: www.elsevier.com/locate/ijhm

Going keyless for a seamless experience: Insights from a unified hotel access control system

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ARTICLE INFO

Keywords:
Keyless system
Seamless experience
Hotel
Check-in
Room access
Technology acceptance

ABSTRACT

Service providers are increasingly searching for new and innovative ways of providing customers with a seamless experience in the service environment. This paper used an engineering approach to service systems development and a model of technology acceptance as a conceptual lens through which to examine hotel guests' acceptance of a unified hotel access control system (UHACS) for seamless hotel check-in and room access. This system is the first of its kind, and this study is the first evaluation of it using two samples consisting of 100 hands-on and 120 online survey hotel guest participants. Before completing the questionnaire, hands-on survey participants were briefed and allowed to practice using the UHACS, whereas online survey participants received a flowchart that explained the concept and process of the UHACS. The data from both samples were analyzed quantitatively through partial least squares structural equation modeling and test of difference. The results showed that the ease of using and usefulness of the UHACS significantly facilitated seamless experiences in hotel check-in and room access, which in turn, significantly and positively shaped attitudes toward the UHACS, and together with its improved security features, encouraged greater intention to use the UHACS. No significant differences in evaluations were found when gender, age, and familiarity with and risk disposition to technology were considered across the two samples. The paper concludes with a discussion of the implications of the findings for theory and practice, the limitations of the study, and directions for future research.

1. Introduction

Today's service providers operate in an aggressive, challenging, and turbulent business environment. Service providers (e.g., hoteliers) often face intense competition from traditional (e.g., established hotel chains, such as the Hilton, Marriot, and Sheraton) and new (e.g., Airbnb) players in the industry (Cetin et al., 2016; Lam et al., 2015) as well as increasing demands from customers who are becoming increasingly difficult to keep and costly to replace (Martínez and del Bosque, 2013; Narteh et al., 2013; Qiu et al., 2015). Indeed, customers today are demanding more from service providers than personalized services and value-added amenities; they also want to enjoy a seamless experience when consuming services (e.g., a hotel stay) (Wang et al., 2016). This has led to growing interest among academics and service providers to better understand the development and outcomes of seamless experiences when service providers invest to create such experiences for their customers (e.g., Ernst and Young, 2013; PwC, 2016; Sharma, 2016).

In essence, a seamless experience occurs when customers transition from one activity to another in ways that are connected, continuous, smooth, uninterrupted, and hassle-free (e.g., Mullet, 2003; Slywotzky and Weber, 2011). A seamless experience is created by service providers that align and present a single face across the solutions, either through an alliance orientation (e.g., interfirm business modeling and integration of different customer journeys, such as integrated care) or a touchpoint orientation (e.g., omnichannel and customer data integration, such as pre-purchase, purchase, and post-purchase). This allows service providers to respond to customer needs in a consistent way (i.e., a unified view of customers and service providers) (Carroll and Guzman, 2015; Homburg et al., 2017). Seamless solutions empower customers with greater control by easily allowing them to choose what, how, when, where, and with whom they want to engage when they interact with service providers (e.g., choice of product, place, and

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https://doi.org/10.1016/j.ijhm.2018.03.014
Received 23 June 2017; Received in revised form 16 March 2018; Accepted 22 March 2018
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platform; Simon et al., 2016). In doing so, service providers create customer journeys that are effortless and enjoyable, and in turn, positively shape current and future customer behavior (e.g., favorable attitude, greater patronage and usage intention, high satisfaction, and continuing loyalty) (Huré et al., 2017; Watkinson, 2012; Weber and Prodromou, 2015). This is an obvious desire, but unfortunately it is difficult to satisfy, as continued customer complaints in the area demonstrate (e.g., long check-in and waiting times, and malfunctioning smart cards) (Kokkinou and Cranage, 2015; Memarzadeh and Chang, 2015; Rishi and Joshi, 2016). Given these contemporary challenges, many service providers are now searching for new and innovative ways of providing their customers with a seamless experience in the service environment.

Recent technological advances have led to the emergence of an innovative, strategic solution: the concept of keyless systems or “going keyless.” A keyless system fulfills the functions of traditional key-enabled systems, such as granting authorized users access (e.g., by unlocking the system) to what is protected by the system (e.g., possessions or a room) without the need for original equipment manufacturer keys, regardless of its form (e.g., a physical key or smart card that is often reusable and owned by system owners, such as hoteliers). Instead, a keyless system generates a unique identifier (e.g., code) that is sent directly (e.g., email or mobile application) to authorized users (e.g., hotel guests), who can then use the identifier on an existing user platform (e.g., printouts or smartphones) to gain access. In the service environment, keyless systems have the potential to provide customers with a seamless experience by avoiding the potential interruptions associated with key-enabled systems (e.g., long waits for keys, malfunctioning of electronic keys, such as smart cards, and the risk of physical key duplication by previous users), and, more importantly, to enjoy a smooth and uninterrupted experience while consuming services (e.g., easy to use, useful, and secure systems). However, realizing this potential is challenging, as service providers must choose and implement appropriate technology in a way that encourages take-up and reduces customer resistance to keyless systems.

More specifically, there are two main limitations to existing keyless systems’ ability to facilitate a seamless experience. First, most keyless systems rely on transmission and reception of low-energy or radio signals (e.g., Bluetooth low energy [BLE], near field communication [NFC], and radio frequency identification [RFID] technologies) for connection and communication between a user and the system (Cobos et al., 2016; Egger, 2013; Ok et al., 2010). If service providers adopt keyless systems that rely on these technologies, their customers need to own and/or use appropriate smart devices to use the keyless system. This creates a problem for service providers that would like to go keyless but have customers who may not own or use compatible devices. Second, keyless systems that use an array of technologies (or provide multiple options, such as quick response [QR] technology, which is the ability to scan and recognize a printout or digital copy of a QR code) to overcome the first limitation tend to be limited in scope (e.g., enable check-in or room access but not both) (Kokkinou and Cranage, 2013, 2015; Wei et al., 2017). Both these issues limit the extent to which keyless systems can provide customers with a seamless experience in the service environment.

Against the background of these issues and the design of existing keyless systems, this paper aims to describe and analyze users’ perceptions of a keyless system that service providers can use to offer customers a seamless experience in the service environment. Hotels will be used as an example of a hospitality service for three main reasons. First, most hotels use key-enabled systems for room access, and these could be replaced with keyless systems to create a seamless experience for hotel guests (e.g., to avoid problems of malfunctioning smart cards). Second, most hotels require hotel guests to check-in and collect room keys at a registration counter. A keyless system could eliminate the need for this by allowing hotel guests to go directly to their room and check-in and access their room with a single action (e.g., flash QR code at door control panel). In doing so, a keyless system offers hotel guests convenience, simplicity, and time savings, and, thus, a seamless experience. Third, most hotels that use keyless systems rely on low-energy or radio signals-based technologies (e.g., BLE, NFC, RFID) or make only limited use of them (e.g., either check-in or room access only). Therefore, there is an opportunity to develop and implement a system that addresses these limitations and provides hotel guests with a seamless experience. This paper describes the use of an engineering approach to service systems to develop a unified hotel access control system (UHACS) that provides hotel guests with keyless options (i.e., a printout or digital copy of a unique code) for hotel check-in and room access. The paper also examines hotel guests’ acceptance of the system using the technology acceptance model (TAM) as a theoretical framework. Both these strands of research contribute to the theoretical and practical understanding of how to use well-designed keyless systems technology to provide customers with a seamless experience in the service environment.

2. TAM

The acceptance and use of information systems and technology has attracted considerable research attention in the hospitality and service field in recent years (Ayeh et al., 2016; Blut et al., 2016; Bonn et al., 2016; Parasuraman and Colby, 2015; Robertson et al., 2016; Smith et al., 2014). TAM is one of the theoretical frameworks most commonly used to understand how users come to accept and use information systems and technology (Lee et al., 2012; Morosan, 2011; Morosan and Jeong, 2008; Wang and Qualls, 2007). Originally proposed by Davis (1989), the model postulates that user intention to adopt a given technology, including technologically mediated information systems can be predicted from user attitudes and perceptions of that technology, particularly its ease of use and usefulness (Davis, 1989; Davis et al., 1989). Over time, the model has evolved to include other relevant user perceptions, such as perceptions of associated risks, to improve its conceptual robustness and contextual relevance, and reinforce its position as one of the most useful grand predictive models of technology acceptance (Antón et al., 2013; Karahanna et al., 2006; King and He, 2006; Venkatesh and Bala, 2008; Venkatesh and Davis, 2000). Indeed, TAM is often chosen as a theoretical framework because of its flexibility to accommodate and extend to other types of user characteristics and perceptions of a studied technology in ways that empower conceptual frameworks on technology acceptance to become contextually relevant while remaining highly parsimonious (Lim and Ting, 2014; Teh et al., 2014). TAM has received its fair share of criticisms (e.g., limited explanatory and predictive power, lack of practical relevance, and triviality) (Bagozzi, 2007; Chuttur, 2009). However, its proponents contend that TAM remains relevant when it is combined with contextually relevant underpinnings (e.g., perceived seamlessness) and when it is tested using methodological treatments that demonstrate high explanatory and predictive power (e.g., cross-sample validation and high R^2) and practical relevance (e.g., experimentation and hands-on evaluation of the actual product) (Lim, 2018). In line with this reasoning, this paper adopts TAM as a conceptual lens for describing and explaining user acceptance of a newly developed service system, specifically, a keyless system in the form of a UHACS. Hoteliers, as service providers, can use this system to facilitate a seamless experience for customers in the service environment, in particular hotel check-in and room access by hotel guests. This paper contends that key enablers to the creation and facilitation of seamless hotel check-in and room access experiences using a UHACS are ease of use and usefulness, which in turn positively shapes attitudes and intentions toward UHACS use (see Fig. 1). The rationale behind the contention between perceptions of ease of use, usefulness, and seamlessness is predicated on the work of recent scholars such as Brade et al. (2017), who demonstrated (1) the difference between usability and user experience—that is, usability encapsulates the pragmatic (or rational) aspects of a specific technology

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