

Factors influencing the adoption postponement of mobile payment services in the hospitality sector during a pandemic

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ARTICLE INFO

Keywords:

COVID-19 pandemic
Hospitality management
Travel booking
Mobile payment services
Privacy concerns
Security concerns

ABSTRACT

In the post-COVID-19 era, the hospitality sector may witness a wider use of mobile payment services (MPS) not requiring physical contact. But consumers may postpone adoption of MPS in wait for a more attractive iteration. Given consumers' reluctance to adapt to such services, an investigation into MPS adoption postponement and the factors contributing to it is thus needed. Our research model extends the innovation resistance theory by including two behavioral measures (privacy concerns and visibility) and examining how security concerns moderate the associations between them. We analyzed data from 308 respondents who had previously purchased accommodation and transportation services using MPS, employing structural equation modeling to test the research model. The crucial factors we identified were usage barrier and image barriers, privacy concerns, and visibility. Furthermore, security concerns significantly moderated the association between image barrier and MPS adoption postponement in the hospitality sector. The present study thus has important theoretical and practical implications for hospitality managers, particularly for understanding consumers' behavior toward MPS use and how to leverage these services accordingly. Finally, we suggest that future researchers may investigate the factors causing the adoption postponement of other technological innovations in this sector.

1. Introduction

Over the last decade, consumer preferences in retail payments, including those in the hospitality sector, have gradually shifted toward innovative mobile-based payment gateways (Sun et al., 2020). To cope with this trend, service providers in this sector had to embrace these technological innovations to improve their service offerings (Bhatiasevi & Yoopetch, 2015; Morosan & DeFranco, 2016a). Consequently, the popularity of mobile payment services (MPS) has steadily grown in the hospitality sector in recent years (Liu & Mattila, 2019), with a recent survey conducted in China suggesting that 93.2% of consumers pay their restaurant bills through MPS (Statista, 2019).

The hospitality management literature have often examined factors behind the adoption of various online payment gateways, including MPS (Morosan & DeFranco, 2016a; San Martín & Herrero, 2012). These

studies are commonly guided by the Technology Acceptance Model (TAM) (Davis et al., 1989), the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003), its sequel, the UTAUT 2 (Venkatesh et al., 2012), as well as the Expectation Confirmation Theory (Talwar et al., 2020d) and diffusion of innovation (Kaur, Dhir, Bodhi, Singh, & Almotairi, 2020a). These approaches have two main drawbacks. First, acceptance models are more suitable for analyzing consumers' initial intention to adopt a recently launched technology (Davis et al., 1989; Venkatesh et al., 2003, 2012) than for understanding consumers' use behavior in the long run. Second, such models focus on positive contributing factors toward the technology's acceptance (Choudrie et al., 2018) rather than barriers that hinder or postpone its adoption.

A seminal innovation may face resistance due to situational factors arising during both its production (Ferreira & Alcantara, 2016; Ferreira,

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<https://doi.org/10.1016/j.jhtm.2020.11.004>

Received 4 March 2020; Received in revised form 22 October 2020; Accepted 7 November 2020

Available online 1 December 2020

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Toledo, & Rodrigues, 2020) and its consumption (Park & Koh, 2017; Talwar et al., 2020a, b, c). Innovation resistance from target consumers may vary in degree (Ram & Sheth, 1989; Seth et al., 2020), as manifested in terms of their rejection, postponement, and opposition toward it (Talwar et al., 2020a, b, c). Innovation rejection refers to the straightforward refusal to accept the innovation, while innovation opposition expresses strong negative feelings regarding it (Talwar et al., 2020a, b, c). In addition, consumers may postpone adopting an innovation if they find it acceptable to wait for a more attractive iteration (Park & Koh, 2017). Consumers often postpone adoption of innovations because they expect that the iterations may offer more advanced technology (Park & Koh, 2017) at a lower cost (Kleijnen et al., 2009). Therefore, it is apposite to examine consumers' behavior toward the adoption postponement of MPS in the hospitality sector, particularly as the COVID-19 pandemic has forced consumers to opt for contactless payments.

Empirical studies examining the factors influencing consumers' continued usage of online payments are rare, especially in hospitality management (Huang et al., 2020). Liu and Mattila (2019) have argued that examining the psychological processes involved in using MPS is of particular interest in the hospitality sector. There is thus a clear need to study the underlying psychological factors, including technology adoption, that influence consumers' decision-making process in availing themselves of hospitality services (San Martín & Herrero, 2012). Specifically, superior innovations in MPS may often become unsuccessful due to a high degree of consumer resistance (Kaur, Dhir, Singh, Sahu, & Almotairi, 2020c); in fact, a study by David-West et al. (2018) confirmed that barriers toward online payment gateways are common. Accordingly, we aim to address the paucity of research on factors contributing to the adoption postponement of MPS in the hospitality sector by drawing from the Innovation Resistance Theory (IRT) (Ram & Sheth, 1989; Talwar et al., 2020b). We restrict this study's scope to travel bookings, which include reserving hotel rooms and purchasing tickets for flights, buses, and trains.

The IRT is a pioneering theoretical framework for studying five consumer barriers, such as usage barrier, value barrier, risk barrier, tradition barrier and image barrier, toward newer innovations (Ram & Sheth, 1989). Therefore, our first research objective is to examine whether the IRT framework's consumer barriers are associated with the hospitality consumers' adoption postponement of MPS. In addition, recent studies have suggested that privacy-related concerns may influence the adoption of online payment gateways (Johnson et al., 2018; Morosan & DeFranco, 2016b), as may visibility, which refers to the prominence of the innovation in society (Carton et al., 2012; Shaikh & Karjaluo, 2015). Hence, our second research objective is to examine whether privacy concerns and visibility are associated with consumers' adoption postponement of MPS. Furthermore, prior literature has suggested that security concerns may moderate the association between different barriers and the adoption postponement of MPS (Mangin, 2014; Yoon & Occeña, 2014). Specifically, consumers may fear unauthorized access to their sensitive personal information as a result of using these services (DeFranco & Morosan, 2017). Thus, our third research objective is to examine whether security concerns moderate the relationships between different IRT framework barriers, as well as privacy concerns, visibility, and the outcome variable, consumers' adoption postponement of MPS.

Guided by previous research in this domain, we developed a research model that extends the IRT framework by including important behavioral measures, namely privacy concerns and visibility, and security concerns as a moderating variable. We tested our model using a cross-sectional dataset collected from 308 respondents who have used MPS for booking travel accommodation and transportation in India. This study's findings provide important theoretical and practical implications for understanding hospitality consumers' behavior toward MPS use and propose several future research agendas.

The rest of the paper is structured as follows. Section Two introduces

the background literature on consumer barriers provided by the IRT framework. The research model and hypotheses are presented in the third section, while in the fourth section, we report the data analyzed to test our hypotheses. The results of this analysis are presented in the fifth section, with an in-depth discussion in the sixth. Section Seven highlights the theoretical and practical implications of the study. Finally, we present a brief assessment of this study's limitations as well as future research recommendations in the eighth section and conclude the paper in the ninth.

2. Background literature

2.1. Innovation resistance theory (IRT)

The IRT includes two broad categories of barriers: functional and psychological (Ram & Sheth, 1989). Functional barriers (usage barrier, value barrier, and risk barrier) originate from consumers' perceptions of changes resulting from adopting innovation. In contrast, psychological barriers (tradition barrier and image barrier) arise from the perceived contradictions to consumers' prior beliefs while adopting an innovation (Kaur, Dhir, Ray, Bala, & Khalil, 2020b; Kaur, Dhir, Kaur, Dhir, Singh, et al., 2020). Recent studies have reinforced the importance of the IRT framework in the MPS context, stating that innovation resistance creates a barrier to the usage of online payment gateways and MPS in India (Kaur, Dhir, Singh, et al., 2020; Sivathanu, 2018).

2.1.1. Functional barriers

Researchers have studied functional barriers according to three types of functional resistance: (a) usage, (b) value, and (c) risk. A usage barrier is observed when innovation conflicts with consumers' existing work-flows and habits (Kaur, Dhir, Singh, et al., 2020, Kaur, Dhir, Ray, et al., 2020; Ram & Sheth, 1989), resembling the idea of 'perceived ease-of-use' from TAM (Davis et al., 1989). This component is also closely related to 'complexity,' that is, the consumer's perceived difficulty in understanding and using the innovation (Rogers, 1962). Usage barriers are thus critical to measuring the practical usability of an innovation.

Meanwhile, a value barrier develops when consumers perceive innovation as incapable of delivering better functionalities than alternative options using the same economic resources (Kaur, Dhir, Singh, et al., 2020, Kaur, Dhir, Ray, et al., 2020; Ram & Sheth, 1989). In such cases, consumers resist changing their present practices (Ram & Sheth, 1989).

A risk barrier emerges when consumers perceive innovation as posing inherent risks (Kaur, Dhir, Singh, et al., 2020, Kaur, Dhir, Ray, et al., 2020; Ram & Sheth, 1989). These can span (a) physical risks, wherein an innovative product can cause harm to lives or belongings; (b) economic risks, in which an investment in an innovation turns out to be a waste of money; (c) functional risks, where an innovation fails to provide the expected level of functionality; and (d) social risks, wherein the adopter of an innovation fears negative views from peers (Ram & Sheth, 1989).

2.1.2. Psychological barriers

Researchers commonly study two types of psychological resistance, namely tradition barriers and image barriers. A tradition barrier reflects resistance to any change in a consumer's daily routines that the innovation may cause (Ram & Sheth, 1989). In the case of MPS, a tradition barrier may occur if a consumer prefers to interact with banks in-person to perform banking operations instead of adopting new technologies (Kaur, Dhir, Singh, et al., 2020).

An image barrier arises from stereotypes about an innovation, which may relate to its country of origin or an associated brand (Ram & Sheth, 1989). In the context of our study, both tradition and image barriers are important because MPS reduces dependence on cash, thereby challenging existing payment routines, and combats prior beliefs that technology use is complicated or that errors and technical glitches can occur

(Kaur, Dhir, Ray, et al., 2020).

2.2. Other barriers to MPS adoption

According to Rogers (1962), the observability of the innovation's use in society may influence its adoption. This concept is referred to as visibility in several studies (Talwar et al., 2020a, b; Kaur, Dhir, Bodhi, et al., 2020). In addition, the extant literature on online payment gateways often discusses such services' privacy concerns (Chen, 2013). Recent studies on MPS use in the hospitality sector have suggested that these factors (Huang et al., 2020; Talwar et al., 2020a, b) may thus contribute to consumers' adoption postponement of MPS. Therefore, to build a comprehensive model, we expand the original IRT framework by including both privacy concerns and visibility in our study.

2.2.1. Privacy concerns

Information privacy risk is associated with fears of exposing sensitive consumer information, both personal and financial, to unauthorized access (Chen, 2013; Khanra, Dhir, Islam, & Mäntymäki, 2020, b). In the context of online banking, for example, a consumer may be concerned about privacy, as personal information, such as the consumer's identity, is also entered during monetary transactions (Chang et al., 2018). Furthermore, consumers may fear that excessive personal data is collected during online transactions as well (Ozturk et al., 2017). Therefore, established theoretical frameworks related to consumer acceptance have often been expanded to understand issues related to perceived privacy risks in MPS use (Chen, 2013; Johnson et al., 2018).

2.2.2. Visibility

The diffusion of innovation theory (Rogers, 1962) recognizes that the potential adopters of an innovation tend to reduce the uncertainty associated with it by accumulating information from society. Visibility refers to how apparent the usage of an innovation is to the potential users (Cruz et al., 2010). Thus, high visibility means that an innovation can be easily and frequently observed by others within the society (Talwar et al., 2020a, b; Kaur, Dhir, Bodhi, Singh, & Almotairi, 2020a).

3. Research model and hypothesis development

3.1. Usage barrier

Laukkanen & Cruz, 2010 argued that the usage barrier presents the strongest obstacle toward mobile banking among the five specified in the IRT framework. Moreover, Kaur, Dhir, Bodhi, et al. (2020a) reported that usage barriers negatively correlate with the intention to use and recommend MPS. Successful deployment of information technology (IT) projects, for example, often face usage barriers in airports (Han, Lee, & Kim, 2018), hotels (Okumus et al., 2017), and restaurants (Lee et al., 2019), among other hospitality contexts. Liébana-Cabanillas and Lara-Rubio (2017) reported that merchants who resist using MPS do so because of their lack of knowledge and understanding of how the payment systems works, which poses a significant usage barrier for them. Building on these studies, we develop our first hypothesis as follows:

H1. The usage barrier is positively associated with the consumers' adoption postponement of MPS.

3.2. Value barrier

Consumers tend to develop adoption barriers toward an innovation if they perceive it as offering an insignificant relative advantage (i.e., low value) compared with existing alternatives (Ram & Sheth, 1989). The likelihood of MPS adoption would thus proportionately increase with its relative advantage (Kaur, Dhir, Singh, et al., 2020). In the mobile banking context, the value barrier has already been reported (Laukkanen & Kiviniemi, 2010). Furthermore, Sivathanu (2018) confirmed that

the value barrier significantly contributes to innovation resistance to MPS. Value barriers also reportedly hinder the use of IT services in hospitality contexts, such as peer-to-peer accommodation (Tussyadiah & Pesonen, 2018), hotels (Okumus et al., 2017), and restaurants (Lee et al., 2019). These arguments lead us to our second hypothesis:

H2. The value barrier is positively associated with the consumers' adoption postponement of MPS.

3.3. Risk barrier

Perceived risks are often inherent in innovations by their very nature (Lee et al., 2016). Huang et al. (2020) suggested that risk barriers concerning hospitality services may lead consumers to discontinue using the innovation. In the context of mobile banking, for example, consumers generally perceive the risks from their devices' limited battery life and the poor strength of the wireless connection (Laukkanen, 2016; Laukkanen & Kiviniemi, 2010). Furthermore, many consumers perceive risk in making mistakes while performing online transactions, as they may be unfamiliar with the processes (Kaur, Dhir, Ray, et al., 2020). This barrier greatly influences innovation resistance to MPS, as confirmed by a recent study (Sivathanu, 2018). Lowering these risks during payments, for example, may ensure repeated patronage of shoppers in duty-free stores at an airport (Han, Lee, & Kim, 2018). Following these arguments, our third hypothesis is formulated as follows:

H3. The risk barrier is positively associated with the consumers' adoption postponement of MPS.

3.4. Tradition barrier

When it comes to performing banking transactions, consumers may prefer traditional banks to online payment gateways as they may have a greater familiarity with the former (Laukkanen, 2016; Park et al., 2017). An exploratory study conducted across four countries with advanced wireless infrastructure revealed that the tradition barrier may act as an inhibitor, delaying the diffusion of mobile banking services (Luo et al., 2012). Laukkanen (2016), for example, identified the tradition barrier as a key factor behind the rejection of internet banking in Finland. Meanwhile, Park et al. (2017) reported that habit plays a critical role in using traditional payment methods instead of MPS in South Korea. Tradition barriers are commonly observed in consumers of hospitality services, such as patrons at a restaurant (Lee et al., 2019). In addition, tradition barriers toward innovations in this sector may also be displayed by service providers, including restaurant staff (Lee et al., 2016) and merchants (Liébana-Cabanillas & Lara-Rubio, 2017). These findings from prior research (Laukkanen, 2016; Lee et al., 2019; Park et al., 2017) thus guide us to develop our fourth hypothesis:

H4. Tradition barrier is positively associated with the consumers' adoption postponement of MPS.

3.5. Image barrier

Image barriers toward the internet-based payment ecosystem may emerge from the unavailability of information to the public (Kaur, Dhir, Bodhi, et al., 2020), frequently failed transactions (Laukkanen & Kiviniemi, 2010), and the lack of demand from the merchants' side (Liébana-Cabanillas & Lara-Rubio, 2017). Furthermore, Laukkanen (2016) reported that the image barrier is primarily responsible for driving the rejection of mobile banking. In the hospitality context, image barriers impact the booking of peer-to-peer accommodation (Tussyadiah & Pesonen, 2018), the pre-implementation of IT projects in hotels (Okumus et al., 2017), and shopping in duty-free stores within airports (Han, Lee, & Kim, 2018). These prior findings thus lead us to formulate our fifth hypothesis:

H5. The image barrier is positively associated with the consumers'

adoption postponement of MPS.

3.6. Privacy concerns

Privacy risks create barriers to adopting different modes of MPS. For instance, in-store MPS in France (De Kerviler et al., 2016), people-to-people mobile wallet services in South Africa (Matemba & Li, 2017), tap-and-go payments among university students in the US (Bailey et al., 2017), and MPS in China (Su et al., 2018) have all faced barriers as a result of these concerns. Even MPS available worldwide from high-profile technology companies, including Apple, Google, and PayPal, are not spared from such risk perceptions (Johnson et al., 2018). In general, consumers in the hospitality sector are reportedly concerned about data privacy while using hospitality services online (Han, Lee, & Kim, 2018; Huang et al., 2020; Tussyadiah & Pesonen, 2018), particularly when it comes to using mobile applications (Talwar et al., 2020b). Therefore, we extend this argument to our study through the following hypothesis:

H6. Privacy concerns are positively associated with consumers' adoption postponement of MPS.

3.7. Visibility

The higher the visibility is for an innovation within the hospitality sector, the more likely consumers are to adopt it (Talwar et al., 2020a, b). For instance, a hotel aggregating platform's higher visibility may feature better price incentives, a greater range of room listings, and customer-friendly policies (Talwar et al., 2020a, b). This is especially important as hospitality consumers prefer to avail themselves of services from highly visible hotels (Talwar et al., 2020a, b) and restaurants (Lee et al., 2016). Furthermore, a literature review on mobile banking adoption recognized visibility as one of the most important constructs used in conceptual models (Shaikh & Karjaluoto, 2015). From the merchants' perspective, higher visibility of MPS indicates a steady stream of revenue, which may motivate them to allocate the resources required for accepting payments through these systems (Carton et al., 2012). We thus investigate the importance of visibility in the hospitality sector through our seventh hypothesis:

H7. The visibility of MPS is negatively associated with the consumers' adoption postponement of MPS.

3.8. The moderating role of security concerns

Security threats arise when personal data are either stolen (e.g., from a hacked device) or retrieved (e.g., from a lost or stolen device), which may result in different financial and non-financial losses incurred by the consumer (Khanra, Dhir, Islam, & Mäntymäki, 2020, b; Liu, 2015). Security-related concerns often impose barriers to MPS adoption (Johnson et al., 2018; Oliveira et al., 2016) and may also influence consumers' intentions to use online platforms to book peer-to-peer accommodation (Huang et al., 2020) as well as lead merchants to resist the use of MPS (Liébana-Cabanillas & Lara-Rubio, 2017). Furthermore, security concerns may moderate the association between the factors influencing the use of services, such as online banking (Mangin, 2014), mobile banking (Yoon & Occena, 2014), and hotel booking (Talwar et al., 2020a, b). Therefore, to examine whether security concerns play a moderating role in the context of MPS, we formulate our next hypothesis:

H8. Security concerns moderate the relationships reported in hypotheses H1 to H7.

3.9. Control variables

Prior research has found that the adoption of internet- and mobile-

based services are influenced by demographic factors (Humbani & Wiese, 2018; Khalilzadeh et al., 2017). For example, Choudrie et al. (2018) argued that different society members embrace mobile-based financial technologies differently, with age and gender being further identified as significant predictors of use (Khalilzadeh et al., 2017; Laukkanen, 2016). These variables are particularly important for market segmentation and may influence consumer adoption of MPS (Humbani & Wiese, 2018). Similarly, educated individuals tend to embrace internet banking more than their less-educated counterparts (Laukkanen & Kiviniemi, 2010). Consequently, we controlled for the possible influence of age, gender, and educational background on the consumers' adoption postponement of MPS.

4. Method

We developed a research model comprising seven independent variables associated with the adoption postponement of MPS (see Fig. 1), with consideration for the possible moderating role of security concerns. Table 1 briefly introduces the independent variables and moderator. However, as no prior validated scales were available to measure the adoption postponement of MPS in the hospitality sector, we adapted the IRT scales used by previous scholars in the context of travel booking. We followed a multi-method approach recommended by McMillan and Hwang (2002), including a literature review, expert opinion, and cross-sectional survey. The research model was then tested following both qualitative and empirical studies, as presented in Fig. 2.

4.1. Qualitative inquiry

A qualitative inquiry was conducted with 20 participants (12 males and 8 females) who represented this study's target population. The participants answered an open-ended essay containing five questions focused on different aspects of MPS use in the hospitality sector, namely pattern and purpose of MPS usage, the concerns and challenges of using MPS, and why MPS deserves criticism. The participants were encouraged to elaborate their insights with real-life examples, wherever applicable, and were assured confidentiality as no personally identifiable information was sought. Before writing the essay, participants were briefed about our research objective. They were further informed that their participation was purely voluntary and would not be incentivized by financial or other rewards. As such, they could withdraw from the task at any time without consequences.

We used affinity diagramming to eliminate subjective bias when identifying commonalities in the participants' essays (Beyer & Holtzblatt, 1998). Following this qualitative data analysis, these commonalities were related to the barriers in our study constructs.

4.2. Survey development

We collected cross-sectional data from MPS users to test our research model. The data was collected using a questionnaire (see Table 2), designed to access 31 measurement items utilizing a seven-point Likert scale. The questionnaire was drafted with the help of prior literature on MPS and based on the findings from our qualitative inquiry. Three experts (two academicians and a practitioner from the hospitality sector) refined the questionnaire independently. The academicians had experiences in conducting IRT-based studies and were familiar with the use of MPS in the hospitality context. Following their suggestions, the questionnaire was updated to improve its sequencing and organization and to express certain statements in more lucid ways. The questionnaire contained three questions capturing the respondents' demographic profile (see Table 3) before introducing 31 measurement items related to their respective study variables: usage, value, risk, tradition, and image barriers were measured using four, three, two, five, and four measurement items, respectively (Laukkanen, 2016). Privacy concerns were measured using three items (Johnson et al., 2018), visibility with four

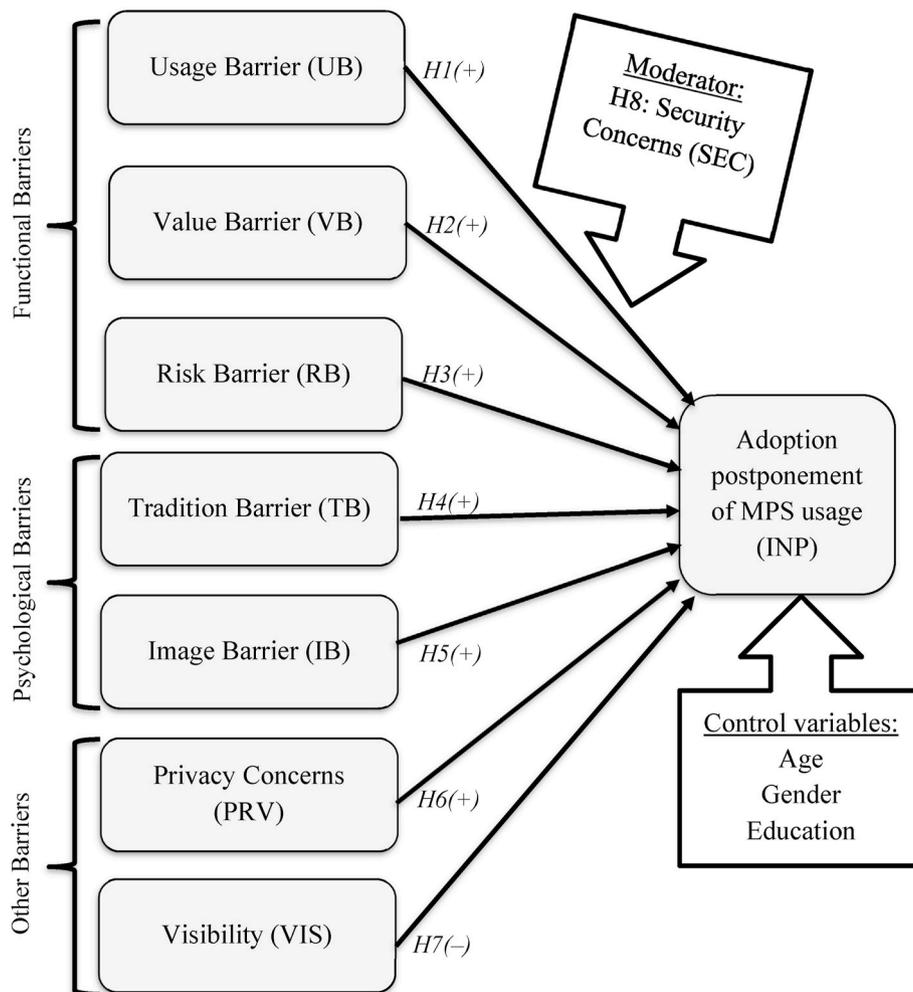


Fig. 1. Proposed research model.

(Talwar et al., 2020a, b; Kaur, Dhir, Bodhi, et al., 2020), and adoption postponement with two (Kleijnen et al., 2009). The moderating variable (i.e., security concerns) was evaluated using two items adapted from Johnson et al. (2018). These measurement items were: (a) I am worried that my money may get stolen when I use MPS for booking travel, and (b) Paytm does not take enough security measures to protect my payments when used for booking travel. Table 4 presents the measurement items, the corresponding study measures, and the relevant sources below.

4.3. Data collection

We circulated an online questionnaire on different social media platforms during July 2020. The questionnaire was in English, which is the preferred language for social media users in India. Our study focused on the users of Paytm, the largest MPS for retail payments in India (Dash, 2020). Among everyone who received our online questionnaire, only those who had used Paytm for availing hospitality services, such as reserving accommodations and purchasing travel tickets, were eligible to participate. We followed confidentiality procedures for all respondents, who took part in our study voluntarily. In total, we collected 312 completed questionnaires, of which we discarded four for failing the consistency check. We then utilized the final sample of 308 valid responses for further data analysis (see Table 3).

5. Results

Our dataset was normally distributed, as skewness and kurtosis of each measurement item were within the acceptable range of ± 1 (Byrne, 2010). Previous literature has suggested that common method bias (CMB) often causes a problem with data accrued from a singular origin (MacKenzie & Podsakoff, 2012). We thus decided to secure the respondents' attention with reversed items in the questionnaire (Talwar et al., 2020a, b) and confirmed that CMB did not cause a significant problem to our data using the following methods. First, Harman's single-factor test established the mono-method variance (MacKenzie & Podsakoff, 2012). Second, we used the common latent factor technique, followed by the confirmatory factor analysis (CFA) marker variable technique (MacKenzie & Podsakoff, 2012), to conduct a robust evaluation of our data. Finally, we tested for multicollinearity issues (O'Brien, 2007) and found them absent in our study.

To analyze the study variables' structural relationship, we used a structural equation modeling (SEM) approach that involved two steps (Anderson & Gerbing, 1988). We first assessed measurement validity and examined the model fit indices. Then, we tested the structural model to examine our hypotheses. We performed the required tests on SPSS 23 and AMOS 23. In addition, we conducted the moderation analysis using the PROCESS macro in SPSS (Hayes, 2017).

5.1. Validity and reliability

The findings from CFA helped us validate the internal and external

Table 1
Introduction of constructs included in the research model.

Construct	Description
Usage barrier (UB)	A usage barrier occurs when an innovation conflicts with the existing workflows, practices, or habits of consumers, causing them to resist the innovation (Ram & Sheth, 1989). Here, the usage barrier refers to the complexity of learning to use MPS (Kaur, Dhir, Ray, Bala, & Khalil, 2020; Kaur, Dhir, Singh, et al., 2020). Usage barriers toward technology are observed in airports (Han, Lee, & Kim, 2018), hotels (Okumus et al., 2017), and restaurants (Lee et al., 2019), among other hospitality contexts.
Value barrier (VB)	A value barrier develops when consumers perceive innovation as incapable of delivering better functionalities compared with the alternative options using the same economic resources (Ram & Sheth, 1989). Sivathanu (2018) confirmed that the value barrier significantly contributes to innovation resistance to MPS. Value barriers toward technology are observed in hospitality contexts, such as hotels (Okumus et al., 2017), peer-to-peer accommodation (Tussyadiah & Pesonen, 2018), and restaurants (Lee et al., 2019).
Risk barrier (RB)	A risk barrier arises when consumers perceive innovation as posing some inherent risks, the degree of which determines the strength of this barrier (Ram & Sheth, 1989). Many consumers perceive risk in making mistakes while performing transactions using MPS, as they may be unfamiliar with the processes (Kaur, Dhir, Singh, et al., 2020, Kaur, Dhir, Ray, et al., 2020). Thus, the risk barrier in the payment process may determine the future patronage of consumers using hospitality services, such as duty-free shoppers in airports (Han, Lee, & Kim, 2018).
Tradition barrier (TB)	A tradition barrier reflects resistance to changes to a consumer's daily routines caused by an innovation (Ram & Sheth, 1989). A tradition barrier may occur if a consumer prefers to interact with banks in-person to perform banking operations instead of adapting MPS (Kaur, Dhir, Singh, et al., 2020). Tradition barriers may be observed among hospitality service consumers, such as customers in a restaurant (Lee et al., 2019) and hospitality service providers, such as restaurant staff (Lee et al., 2016).
Image barrier (IB)	An image barrier arises because of stereotypes about an innovation, which may relate to attributes, such as the house of the brand associated with the innovation (Ram & Sheth, 1989). Image barriers may emerge in the context of MPS from prior beliefs about technology use, such as technology use is complicated (Kaur, Dhir, Singh, et al., 2020, Kaur, Dhir, Ray, et al., 2020), transactions frequently fail (Laukkanen & Kiviniemi, 2010), and merchants prefer payments in cash (Liébana-Cabanillas & Lara-Rubio, 2017). Image barrier is found to impact technology use in hospitality contexts, such as booking of peer-to-peer accommodation (Tussyadiah & Pesonen, 2018).
Privacy concerns (PRV)	The information privacy risk is associated with concerns about exposing sensitive consumer information, both personal and financial, that is not meant for unauthorized access (Chen, 2013). Privacy risks are responsible for creating barriers to the adoption of different modes of MPS, such as in-store MPS (De Kerviler et al., 2016), people-to-people mobile wallet services (Matemba & Li, 2017), and tap-and-go payments (Bailey et al., 2017). Consumers in the hospitality sector have reported concern about their data privacy when booking hospitality services using mobile applications (Talwar et al., 2020b).
Visibility (VIS)	Visibility refers to how apparent the usage of an innovation is in society (Cruz et al., 2010). When the usage of an innovation has high visibility in society, the inclination toward opting for the innovation increases (Talwar et al., 2020a, b; Kaur, Dhir, Bodhi, et al., 2020); for instance, people may perceive that a highly visible hotel aggregating platform offers more benefits to its customers than other platforms (Talwar et al., 2020a, b). Hospitality consumers tend to avail of services from highly visible hotels (Talwar et al., 2020a) and restaurants (Lee et al.,

Table 1 (continued)

Construct	Description
Security concerns (SEC)	2016). Visibility has also been found to be important in the adoption of mobile banking (Shaikh & Karjaluoto, 2015). Security threats arise when personal data are either stolen (e.g., from a hacked device) or retrieved (e.g., from a lost or stolen device), which may result in different financial and non-financial losses incurred by the consumer (Liu, 2015). Security concerns may play moderating roles on the associations between the factors influencing the use and intention to adopt online banking (Mangin, 2014), mobile banking (Yoon & Occena, 2014), and hotel booking (Talwar et al., 2020b).
Adoption postponement (INP)	A seminal innovation may face resistance from target consumers (Ram & Sheth, 1989). The resistance may vary in degree, as manifested in terms of rejection, postponement, and opposition to an innovation (Talwar et al., 2020c). Consumers may postpone adopting an innovation if they find it acceptable, for example, to wait for a more attractive iteration (Park & Koh, 2017). An examination of consumers' behavior toward the adoption postponement of MPS in the hospitality sector is urgently needed when the COVID-19 pandemic has forced consumers to opt for contactless payments.

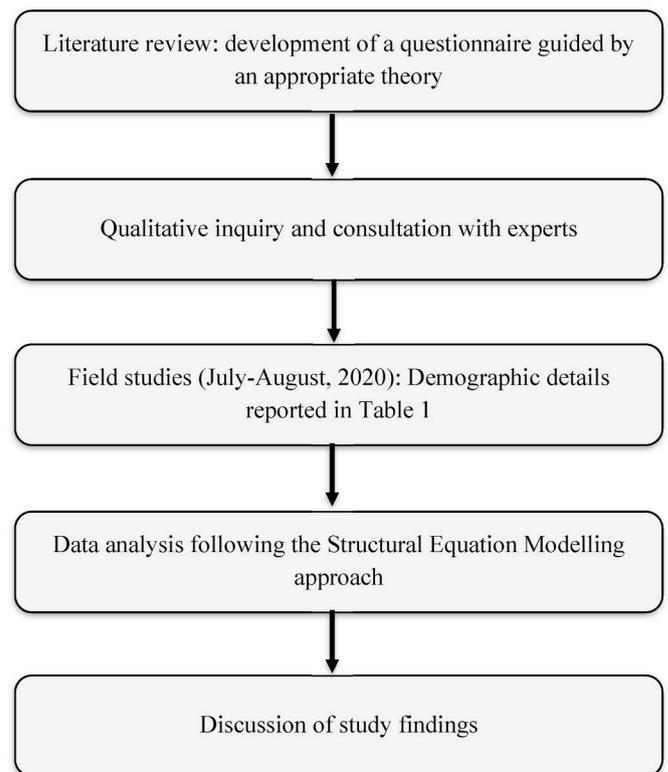


Fig. 2. Sequential steps of this study.

consistency of constructs. Values for composite reliability (CR) were computed to test each scale item's internal consistency (Nunnally, 1978). The constructs possessed sufficient convergent validity, as the factor loadings for all measurement items were above the threshold limit of 0.50, the average variance extracted (AVE) were above 0.50, and the composite reliability (CR) for these measures was above 0.70 (Byrne, 2010; Hair et al., 2010) (see Table 5). The test results further confirmed enough discriminant validity because the AVE's square roots were higher than the correlation coefficients among constructs (Fornell & Larcker, 1981). The AVE also surpassed the average shared variance (ASV) and the maximum shared variance (MSV) (see Table 5). Finally, we loaded the remaining factors to a single factor model whose poor fit

Table 2**Questionnaire to Measure Barriers Towards the MPS.**

Please respond to this questionnaire only if you have used MPS (i.e., Paytm) for hospitality services. Your responses will be saved anonymously and used for research purposes only.

Please report the extent you agree with the following statements by selecting an appropriate number between 1 to 5, where '1' = strongly disagree, '2' = slightly disagree, '3' = neither agree nor disagree, '4' = slightly agree, '5' = strongly agree

Using MPS for booking travel was difficult for me	1	2	3	4	5	6	7
Using MPS for booking travel was inconvenient for me	1	2	3	4	5	6	7
MPS often lags or works slow when used for booking travel	1	2	3	4	5	6	7
The steps to use MPS for booking travel are not clear to me	1	2	3	4	5	6	7
Using MPS for booking travel is too complicated to be useful	1	2	3	4	5	6	7
I have an image that using MPS for booking travel is a difficult process	1	2	3	4	5	6	7
I have an image that MPS is not safe to make transactions using MPS for booking travel	1	2	3	4	5	6	7
I have an image that MPS is not safe to provide information to Paytm for booking travel	1	2	3	4	5	6	7
I have seen others use MPS for booking hotels	1	2	3	4	5	6	7
I have seen others use MPS for booking airline tickets	1	2	3	4	5	6	7
I have seen others use MPS for booking train tickets	1	2	3	4	5	6	7
I have seen others use MPS for booking bus tickets	1	2	3	4	5	6	7
I am worried about other people and countries gaining access to my account if I use MPS for booking travel	1	2	3	4	5	6	7
Using MPS for booking travel would reveal my financial information to hackers	1	2	3	4	5	6	7
I always fear that government agencies may spy on us via MPS when used for booking travel	1	2	3	4	5	6	7
MPS does not offer any advantage for booking travel compared with other payment methods (e.g., cash, card, internet banking)	1	2	3	4	5	6	7

Using MPS for booking travel does not increase my ability to control my financial matters by myself	1	2	3	4	5	6	7
Entering data (e.g., name, age, etc.) in MPS for booking travel is a complicated process	1	2	3	4	5	6	7
I fear that money may be debited multiple times from my bank account when MPS is used for booking travel	1	2	3	4	5	6	7
An incoming phone call can fail the in-process transaction on the MPS even after the money is debited for booking travel	1	2	3	4	5	6	7
I do not fear that money may be debited multiple times from my bank account when I use MPS for booking travel (–)	1	2	3	4	5	6	7
I am worried that my money may get stolen when I use MPS for booking travel	1	2	3	4	5	6	7
Paytm does not take enough security measures to protect my payments when used for booking travel	1	2	3	4	5	6	7
I am more comfortable with cash transactions for booking travel	1	2	3	4	5	6	7
MPS transactions for booking travel seem complicated to me	1	2	3	4	5	6	7
I like going to banking offices on a weekday for money transfers	1	2	3	4	5	6	7
Chatting with the teller in the bank boosts my confidence in a money transfer	1	2	3	4	5	6	7
I find travel agents more helpful than MPS for booking travel	1	2	3	4	5	6	7
I think that booking travel using MPS is easy, but I do not use it	1	2	3	4	5	6	7
I think MPS is useful, but I am not using MPS for booking travel	1	2	3	4	5	6	7
I regularly use MPS for booking travel (–)	1	2	3	4	5	6	7

We would like to know a little more about you

Age: years

Gender: Male Female

Educational background Undergraduate degree or lower (B.Sc., B.Tech, etc.)
 Postgraduate degree or higher (M.Sc., MTech, etc.)

Table 3
Demographic characteristics of the study sample (N = 308).

Demographic measures	Category	Percentage (Frequency)
Age (in years)	25 or less	25.3 (78)
	26–35	25.0 (77)
	36–45	19.2 (59)
	46–55	15.6 (48)
	56 or above	25.3 (78)
Gender	Female	57.8 (178)
	Male	42.2 (130)
Educational background	Pursuing/completed Under Graduation	18.8 (58)
	Pursuing/completed Post Graduation	80.2 (247)

confirmed that our dataset was not significantly affected by the common method variance (MacKenzie & Podsakoff, 2012).

5.2. Measurement model

With a chi-square (χ^2) value of 467.7 for 297 degrees of freedom (*df*), the value of this normed χ^2/df ratio stood at 1.58. This ratio represents that the data fit our model, as $\chi^2/df < 3$ are considered ideal values (Hair et al., 2010). The high values of the goodness-of-fit index (GFI = 0.90) and the adjusted goodness-of-fit index (AGFI = 0.88) in the presence of the low root mean square residual (RMR = 0.08) confirmed that the data fitted our measurement model well (Browne & Cudeck, 1992; Hair et al., 2010). The root’s value means a square error of approximation (RMSEA = 0.04) was close to the value of the perfect fit for this model (Byrne, 2010; Hair et al., 2010). Additionally, our model scored comfortably above the cutoff score of 0.90 in the Bentler-Bonett Normed Fit Index (NFI = 0.92), Bollen’s Incremental Fit Index (IFI = 0.97), the

Table 4
Study measures.

Study measures ^a (Reference)	Measurement items
Usage Barrier (Kaur, Dhir, Singh, et al., 2020; Laukkanen, 2016)	Using MPS for booking travel was difficult for me. Using MPS for booking travel was inconvenient for me. MPS often lags or works slowly when used for booking travel. The steps to use MPS for booking travel are not clear to me.
Value Barrier (Kaur, Dhir, Singh, et al., 2020; Laukkanen, 2016; Talwar et al., 2020b)	MPS does not offer any advantage for booking travel compared with other payment methods (e.g., cash, card, internet banking). Using MPS for booking travel does not increase my ability to control my financial matters by myself. Entering data (e.g., name, age, etc.) in MPS for booking travel is a complicated process.
Risk Barrier (Kaur, Dhir, Singh, et al., 2020; Laukkanen, 2016)	I fear that money may be debited multiple times from my bank account when MPS is used for booking travel. An incoming phone call can fail the in-process transaction on the MPS even after the money is debited for booking travel.
Tradition Barrier (Kaur, Dhir, Singh, et al., 2020; Laukkanen, 2016)	I am more comfortable with cash transactions for booking travel. MPS transactions for booking travel seem complicated to me. I like going to banking offices on a weekday for money transfer. Chatting with the teller in the bank boosts my confidence in the money transfer.
Image Barrier (Kaur, Dhir, Singh, et al., 2020; Laukkanen, 2016)	I find travel agents more helpful than MPS for booking travel. Using MPS for booking travel is too complicated to be useful. I have an image that using MPS for booking travel is a difficult process. I do not feel safe making transactions using MPS for booking travel. I would not feel safe providing information to MPS for booking travel.
Privacy concerns (Johnson et al., 2018)	I am worried about other people and countries gaining access to my account if I use MPS for booking travel. Using MPS for booking travel would reveal my financial information to hackers. I always fear that government agencies may spy on us via MPS when used for booking travel.
Visibility (Talwar et al., 2020a, b; Kaur, Dhir, Bodhi, et al., 2020)	I have seen others use MPS for booking hotels. I have seen others use MPS for booking airline tickets. I have seen others use MPS for booking train tickets. I have seen others use MPS for booking bus tickets.
Adoption postponement (Kleijnen et al., 2009)	I think that booking travel using MPS is easy, but I do not use it. I think MPS is useful, but I am not using MPS for booking travel now.

^a The study measures and the associated measurement items were adapted and revised based on expert review.

Tucker-Lewis Index (TLI = 0.96), and Bentler's Comparative Fit Index (CFI = 0.97) (Browne & Cudeck, 1992; Hair et al., 2010). The parsimony adjusted fit indices for our model (PGFI = 0.71, PNFI = 0.78, PCFI = 0.82) also confirmed that our model was not too complex.

5.3. Structural model

The structural model provided a satisfactory model fit ($\chi^2/df = 1.58$, GFI = 0.90, AGFI = 0.88, RMR = 0.08, and RMSEA = 0.04) (Browne & Cudeck, 1992; Hair et al., 2010), as did the baseline fit indices (CFI = 0.97, TLI = 0.96, IFI = 0.97, NFI = 0.92) (Sun et al., 2020). The results of the hypotheses testing are available from Fig. 3 and Table 6. We confirmed that usage ($\beta = 0.19^{**}$) and image ($\beta = 0.21^*$) barriers, privacy concerns ($\beta = 0.16^*$), and visibility ($\beta = -0.21^*$) were significantly associated with consumers' adoption postponement of MPS. However, we found that this adoption postponement was not significantly associated with value, risk, or tradition barriers. Overall, the model explained a 14.6% variance in consumers' adoption postponement of MPS.

5.4. Moderation analysis

We investigated the moderating role of security concerns on the relationships among constructs (see Table 7), with a 95% confidence interval set using the bootstrap method (Sun et al., 2020). We found that security concerns moderated only the association between image barrier and consumers' adoption postponement of MPS, as the confidence interval did not include "0" in the case of this association (Hayes, 2017). The moderator's conditional analysis is reported in Fig. 4 to demonstrate the moderating effect of security concerns at its low, medium, and high levels. We confirm that adoption postponement of MPS proportionately increases with image barrier when security concerns are medium to high (see Fig. 4). However, adoption postponement of MPS is almost unchanged (or slightly decreased) with an increasing image barrier for the respondents who express a low level of security concerns.

5.5. Control variables

We accounted for the respondents' age, gender, and educational background as these are potentially confounding variables in our study context. The study results suggest that, among the three variables, age ($\beta = 0.18^{**}$) had a significant controlling influence on the consumers' adoption postponement of MPS. As such, the adoption postponement of MPS usage was stronger among the older population. However, gender and educational background did not exhibit a controlling influence on the consumers' adoption postponement. The hypothesized results (see Tables 6 and 7) were thus proven to hold irrespective of our respondents' gender and educational background (Byrne, 2010).

6. Discussion

H1 investigated whether the usage barrier is positively associated with the adoption postponement of MPS. Our data supported this hypothesis and reinforced the findings reported in prior literature on internet banking (Laukkanen & Cruz, 2010) and MPS (Liébana-Cabanillas & Lara-Rubio, 2017). Consumers of hospitality services may experience usage barriers in availing themselves of cashless payment methods due to their low expertise in using such technologies (Ozturk, 2016; Rita et al., 2018).

H2 suggested that the value barrier may be positively associated with the consumers' adoption postponement of MPS. However, we did not find support for this hypothesis. Prior research has similarly reported that the value barrier has no impact on the intention to use internet banking (Laukkanen, 2016), mobile banking (Laukkanen, 2016), and mobile-based payments (Upadhyay & Jahanyan, 2016) because MPS provides more convenience, benefits, and control to consumers than the alternative payment options. Inexpensive internet connectivity further diminishes any likelihood of exacerbating the value barrier in our context. The low cost of mobile internet is further expected to increase the adoption of online services in India. Considering that a transaction on Paytm attracts low (often zero) charges for processing payments, it

Table 5
Discriminant validity and reliability.

	Mean	SD	CR	AVE	MSV	ASV	RB	UB	VB	IB	PRV	VIS	INP	TB
RB	3.42	1.22	0.78	0.64	0.14	0.05	0.80							
UB	6.00	0.78	0.82	0.53	0.03	0.01	-0.01	0.73						
VB	4.11	1.65	0.91	0.76	0.03	0.01	-0.01	0.12	0.87					
IB	4.07	1.33	0.92	0.73	0.42	0.15	0.34	-0.04	-0.04	0.86				
PRV	3.97	1.18	0.89	0.73	0.24	0.06	0.07	-0.13	-0.13	0.30	0.85			
VIS	4.35	1.28	0.93	0.77	0.39	0.16	0.21	0.02	-0.17	0.63	0.49	0.88		
INP	4.37	1.66	0.88	0.78	0.04	0.02	0.15	0.17	0.11	0.20	0.11	0.05	0.88	
TB	3.91	1.47	0.92	0.71	0.42	0.15	0.37	-0.04	-0.01	0.65	0.24	0.62	0.13	0.84

Note: SD = Standard deviation; CR = Composite reliability; AVE = Average Variance Extracted; MSV = Maximum Shared Squared Variance; ASV = Average Shared Squared Variance; Diagonal cells report squared roots of AVE.

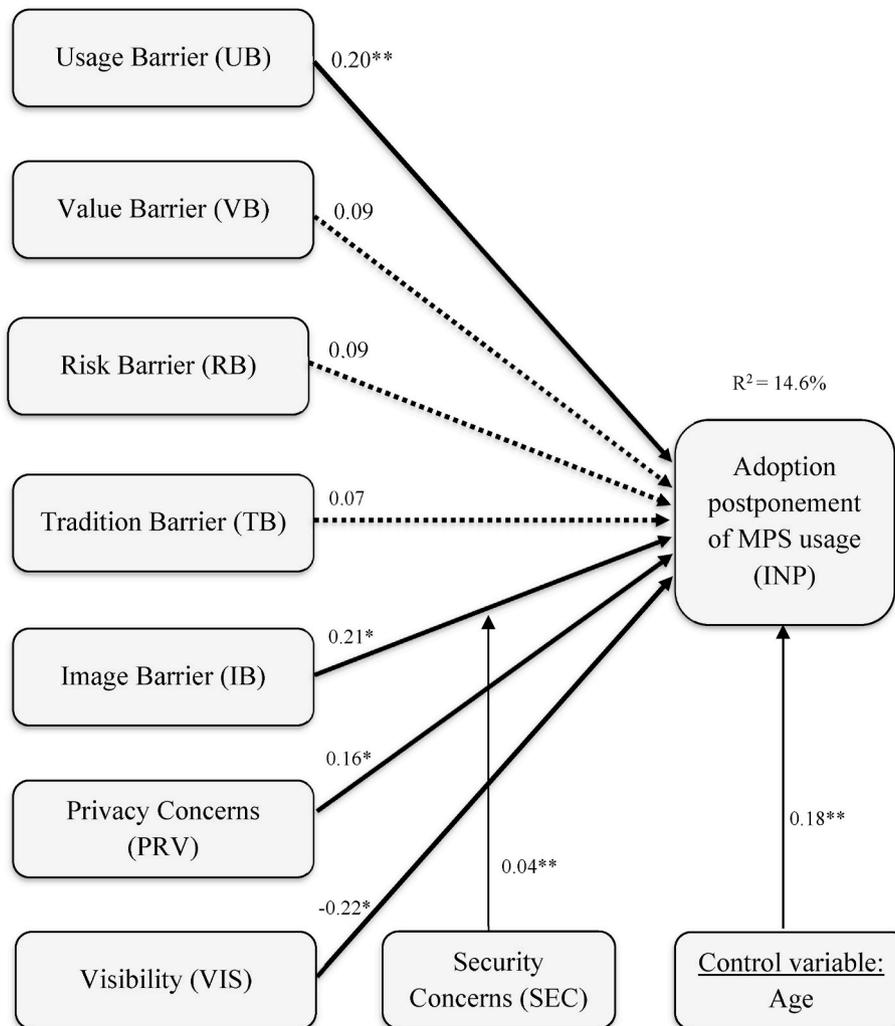


Fig. 3. Results of the structural model.

Table 6
Hypotheses results.

Hypotheses	β	P	Support
H1: UB → INP	0.20	0.01	Yes
H2: VB → INP	0.09	0.17	No
H3: RB → INP	0.09	0.23	No
H4: TB → INP	0.07	0.46	No
H5: IB → INP	0.22	0.02	Yes
H6: PRV → INP	0.16	0.03	Yes
H7: VIS → INP	-0.22	0.03	Yes

Table 7
Moderation results for SEC.

	β	t	p	LLCI	ULCI	Moderation?
UB → INP	-.07	-.74	.46	-.2402	.1090	No
VB → INP	-.12	-2.89	.00	-.2086	-.0397	Yes
RB → INP	.03	.47	.64	-.0916	.1484	No
TB → INP	.05	1.01	.31	-.0518	.1615	No
IB → INP	.13	2.36	.02	.0223	.2472	Yes
PRV → INP	.05	.84	.40	-.0708	.1762	No
VIS → INP	.02	.33	.74	-.0936	.1319	No

Note: H2 (VB→INP) is not supported.

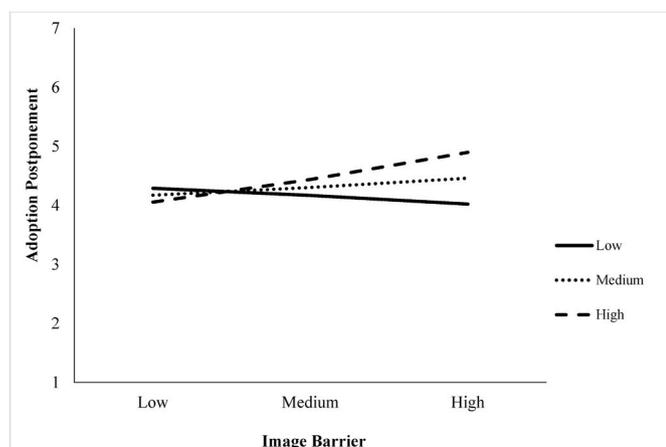


Fig. 4. The moderating influence of the SEC on the association between IB and INP.

can be explained why the value barrier may not contribute toward consumers' adoption postponement of MPS.

H3 was also not supported, indicating that the risk barrier is not associated with the consumers' adoption postponement of MPS. Findings from our qualitative inquiry revealed that no economic risk exists in the context of this study because the mobile application of Paytm may be downloaded on smartphones free of cost. Furthermore, the respondents in our sample appeared well-versed with MPS, and hence, the functional risk was also limited. The significance of physical and social risks was nominal, if not non-existent, in the context of MPS. For this reason, no aspect of the risk barrier was significant in the context of our study. Laukkanen (2016), too, did not find a significant association between risk barrier and usage intention for internet banking and mobile banking.

H4 proposed that the tradition barrier is positively associated with consumers' adoption postponement of MPS. Our study's findings did not support this hypothesis, inconsistent with the results reported in most of the prior literature on online payment gateways (Laukkanen, 2016; Park et al., 2017). A possible reason for this could be that an overwhelming majority of the data sample was already familiar with various forms of cashless payments. Due to this, they might have perceived that MPS did not bring any significant changes to their daily routines and habits. Therefore, the tradition barrier may not be significantly associated with consumers' adoption postponement of MPS. We interpret this as a positive sign for the overall digital economy in India.

H5 was supported, suggesting that the image barrier is positively associated with the consumers' adoption postponement of MPS. This finding suggests the need for diminishing negative stereotypes about MPS. As previously discussed, the unavailability of information for the public (Kaur, Dhir, Ray, et al., 2020), frequently failed transactions (Laukkanen & Kiviniemi, 2010), and the lack of demand from the merchants' side (Liébana-Cabanillas & Lara-Rubio, 2017) could be the major reasons behind an increase in image barriers.

H6, which states that privacy concerns are positively associated with the consumers' adoption postponement of MPS, was supported in our analysis. Our finding was thus in line with several studies reporting that privacy concerns negatively influence adoption-related decisions (Bailey et al., 2017; De Kerviler et al., 2016). Although a study by Ozturk et al. (2017) showed that hospitality consumers were less concerned about data privacy when the usage of MPS was integrated into their lifestyles, this finding may not have implications in our study's context. A possible reason for our respondents' privacy concerns may be connected to a growing awareness about poor data governance by technology-based service providers.

H7 found support, indicating that the visibility of MPS in society was negatively associated with the consumers' adoption postponement of

MPS. In other words, our study found that high visibility of MPS may reduce consumers' adoption postponement. This finding was largely consistent with prior studies reporting instances of a positive association between visibility and technology adoption (Carton et al., 2012; Talwar et al., 2020a).

H8, which states that security concerns moderate the associations reported in all other hypotheses, was partially supported. We found that security concerns affect the strength of only one out of the four relationships supported in our study (refer to H1, H5, H6, and H7). These results were partially consistent with the extant literature (Johnson et al., 2018; Oliveira et al., 2016). We further found that the adoption postponement of MPS increased alongside the image barrier and that security concerns positively moderated this relationship, only when these concerns were medium to high (see Fig. 4). A possible reason for this finding may be that security concerns reinforce the image of booking hospitality services using MPS to be difficult and unsafe among consumers who are serious about their data security. However, security concerns exhibited no significant moderating effect on the relationships hypothesized in H1, H6, and H7. Therefore, we confirmed that no significant difference exists in the changes in adoption postponement of MPS, with respondents expressing different levels of security concerns regarding the usage barrier, privacy concerns, and visibility.

Our results supported prior studies (Humbani & Wiese, 2018; Khalilzadeh et al., 2017; Laukkanen, 2016) that have suggested that a respondent's age may control his or her adoption postponement of MPS. However, gender and educational background may not necessarily influence this behavior. Along similar lines, we found no significant difference in the adoption postponement of MPS based on gender and educational background. Moreover, our analysis of control variables signified demographic inclusivity among similar age groups that use MPS in India to purchase accommodation and transportation services.

7. Study implications

7.1. Theoretical implications

The extant research on MPS has thoroughly investigated the factors influencing these services' adoption in different contexts, including the hospitality sector (Morosan & DeFranco, 2016a; San Martín & Herrero, 2012). These studies employed different acceptance models as theoretical frameworks. For instance, TAM, UTAUT, and UTAUT 2 guided the studies conducted by Ozturk (2016), Khalilzadeh et al. (2017), and Morosan and DeFranco (2016a), respectively. However, there is still a paucity of research investigating MPS adoption postponement in the hospitality sector. To this end, our study applied IRT to this context by investigating the possible reasons for barriers toward MPS adoption. Our research further complements the extant literature by explaining the reasons behind the low usage of MPS among hospitality consumers.

This study extended the original IRT framework by incorporating two significant measures: privacy concerns and visibility, and a moderating variable, namely security concerns. Considering the growing interest in the roles played by these variables in MPS adoption, particularly in the hospitality sector, our extension of the IRT model was justified. First, our findings on privacy concerns add to the discussion on data privacy, which has received greater attention in recent years (Bhatiasevi & Yoopecth, 2015; Morosan & DeFranco, 2016b). Second, the visibility of MPS in the hospitality sector is of prime importance, as indicated in a recent study by Liu and Mattila (2019). Third, security concerns have gained increasing prominence in the literature due to the risk of unauthorized access to consumers' sensitive personal and financial data (DeFranco & Morosan, 2017; Khalilzadeh et al., 2017). We found that security concerns positively moderated only the association between image barrier and consumers' MPS adoption postponement in the context of hospitality services when such concerns were medium to high. However, security concerns had no moderating influence on the association between the other predictor variables and MPS adoption

postponement by users in India, indicating that such effects may be context-specific.

7.2. Practical implications

The acceptance of MPS for hospitality services may help service providers win many of the fragmented transactions that their customers perform in availing themselves of such services. For instance, along with consuming the core experience (i.e., lodging service) at a hotel, guests may avail additional services (i.e., ordering food, using gym, visiting spa, among others) from the hotel throughout their stay (Morosan & DeFranco, 2016b). To this end, the present study has provided several key insights, which are as follows:

First, our study's findings suggest that hospitality managers need to adopt measures to improve the visibility of booking hospitality services using MPS to generate additional revenue. For instance, a hotel's guests purchase more goods and services when MPS is made available (Morosan & DeFranco, 2016a, b), indicating that the guests may purchase additional hospitality services more if such services are made visible to the guests when they book the core hospitality experience. Hospitality managers may project positive impressions about their organizations on digital media by informing consumers about their MPS partners (Ponte et al., 2015). They may also consider advertising the convenience of booking their services using MPS on digital media since visibility on these types of online platforms has gained increasing importance among hospitality consumers (Rita et al., 2018). In this regard, hospitality service providers may explore opportunities to launch co-branding initiatives with MPS providers (e.g., special discounts, promotional cash-back offers, and loyalty rewards) to gain mutual benefits, including acquiring new customers, retaining existing ones, and growing their revenues. MPS providers involved in these initiatives would thus raise awareness about booking hospitality services from their partners, thereby improving the service's visibility.

Second, the hospitality sector's growing dependence on the internet has driven service providers to pay special attention to online service interactions (Bhatiasevi & Yoopetch, 2015). Hospitality managers responsible for online interactions may highlight the extent of the convenience they provide by integrating MPS. In the post-COVID-19 era, consumers may be more inclined toward pre-booking hospitality services using MPS to avoid the risks of disease transmission from interpersonal interactions and payments using physical cash or cards. For example, a recent study confirmed that the COVID-19 pandemic might result in unusual purchasing behavior due to insecurity about the timely availability of essentials or other services as and when required (Laato et al., 2020). However, security concerns need to be effectively addressed to diminish the image barriers contributing to the adoption postponement of MPS in booking hospitality services. For instance, the restaurant industry has traditionally suffered from low computer and network security, making it especially attractive to hackers (Cobanoglu & Demicco, 2007). Hospitality managers may win consumers' trust by advertising the steps taken by their organizations to ensure the security of their sensitive data. For example, they may opt for third-party assurance seals, as hospitality consumers have reported trust in such emblems regarding the security of their data on online platforms (Ponte et al., 2015).

Overall, hospitality managers may find our study helpful in designing and implementing appropriate service strategies and business models to target different user groups booking hospitality services with MPS. It may also motivate managers to invest time, effort, and money in updating MPS-based booking systems by negating factors influencing consumers' adoption postponement of using such services.

8. Limitations and future scope

We acknowledge that this study has inherent limitations stemming from its design, boundary conditions, and context specificity. Future

researchers may take this study forward by addressing these limitations. First, we performed only one survey to collect data for model testing. Empirical studies following a cross-sectional design often suffer from potential biases in data collection. Future researchers may choose other techniques, such as an experimental design or qualitative studies, as well as longitudinal data, to overcome such biases. Second, our study focused on consumers in the hospitality sector who used MPS to purchase travel accommodation and transportation. We did not categorize users for booking different hospitality services, such as reserving hotel rooms and purchasing tickets for flights, buses, and trains. Future studies may examine the impact of varying service settings on different user categories, based on the specific hospitality services they use. Furthermore, future researchers may study MPS adoption postponement among group-level respondents, such as a group of tourists, whose peers may play a strong influencing role. We also recommend that future studies conduct multi-group comparisons and analyses of the measurement model. Third, our findings' generalizability is affected as our online survey was conducted in English among Indian customers who use Paytm, an MPS available in India. Future studies may explore the adoption postponement of such platforms in other countries. Future researchers may also conduct similar surveys in different Indian languages to collect data from a larger consumer base that uses the internet in vernacular languages. Fourth, security concerns regarding MPS use may depend on the amount to be paid for different hospitality services. For instance, the price of a meal in a budget restaurant is typically much lower than an international flight. Future researchers may thus investigate the role of security concerns in using MPS to purchase services at varying price levels. Fifth, intermediaries' perspectives (for example, traditional travel agents) that act as a bridge between hospitality service providers and consumers are not captured in this study. Direct payments from consumers to hospitality service providers often make such intermediaries obsolete. Future research may be dedicated to proposing suitable business models for intermediaries in the hospitality sector.

9. Conclusion

This study reports one of the earliest empirical investigations of the factors influencing the adoption postponement of MPS in the hospitality sector during the COVID-19 pandemic era. Barriers toward innovations are of significant concern in the extant literature (David-West et al., 2018; Laukkanen, 2016). Therefore, our investigation timely addresses the adoption postponement of MPS in this context. The use of contactless payment methods like MPS is poised to be the new normal in the post-COVID-19 era, even for late adaptors of these services. Therefore, more extensive use of MPS may contribute to a faster recovery in this sector from the COVID-19 pandemic. The findings from this study suggest that usage barrier, image barrier, privacy concerns, and visibility are associated with consumers' adoption postponement of MPS regarding hospitality services. In contrast, security concerns moderated the association concerning the image barrier. Hospitality service providers may thus facilitate the wider adoption of MPS by addressing the factors identified in this study. We found the IRT framework to be partially suitable in our study context because three barriers in the framework – value, risk, and tradition – were not significant predictors of MPS adoption postponement in India's hospitality sector. Therefore, the more comprehensive research model we constructed by extending the IRT framework to this context could be viewed as a valuable addition to the existing frameworks on technology adoption.

Financial disclosure statement

No financial interested are involved.

Declaration of competing interest

No conflict of interest.

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