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An innovation resistance theory perspective on mobile payment solutions

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A R T I C L E   I N F O

Keywords:
Consumer behavior
Innovation resistance theory (IRT)
Intentions to recommend
Mobile payments
Resistance
Use intention

A B S T R A C T

Mobile payment solutions (MPSs) are experiencing growth and popularity across the globe because of their convenience and other benefits in performing transactions. However, despite these circumstances and the benefits offered, MPSs are still suffering from challenging situations related to their adoption and usage. The main challenge MPSs have faced in retail is because of the presence of consumer resistance toward their use. The present study investigates the different consumer barriers toward the intentions to use and recommend MPSs. The current study examines the adoption and usage of MPSs through the lens of innovation resistance. We developed the research model based on the innovation resistance theory (IRT) and tested it using a large cross-sectional study with 1256 MPS users. The study findings suggest that usage, risk, and value barriers are negatively associated with intentions to use MPSs. On the other hand, only usage and value barriers have a negative association with users’ intention to recommend MPSs. In comparison, the tradition and image barriers did not share any association with the user intentions. The study offers different implications for practitioners and researchers.

1. Introduction

A mobile payment solution (MPS) is defined as the process of making use of Internet connectivity and mobile devices for processing payments when purchasing goods or services (Di Pietro et al., 2015). Use of MPS for retail payments has expanded with the growth of mobile commerce and online shopping (Kemp, 2013). Indeed, MPSs have become a method of payment for retail purchases as well as from individual to individual. The retail consumer market has witnessed the emergence of different MPSs (e.g., Apple Pay, Google Pay, PayPal, and PayTm) over the last decade. MPSs are a popular and trendy digital innovation offering different affordances, such as being economical, versatile, time-saving, efficient and supporting quick financial transactions (Liebana-Cabanillas et al., 2014). However, despite the fact that MPSs have already made their mark in the retail consumer market over the past decade, they have not yet registered much growth (Hoek, 2017). Similarly, prior literature has also suggested that, except for a few early adopters, MPSs are still far from reaching widespread adoption despite providing different benefits (Zhou, 2013). This issue of slow adoption and acceptance is present in both developed and emerging countries (Shaw, 2015a). According to Statista (2019), the percentage of merchants accepting MPSs for retail purchases has increased from 24% to 29% from 2015 to 2018. On the user side, only 39% of smartphone users worldwide are mobile wallet owners (Rolfe, 2018). This is indeed surprising because mobile phones and Internet connectivity have registered extensive penetration almost everywhere, reaching the saturation point even in emerging markets like India (Economic Times, 2017). Concern for slow diffusion notwithstanding, the number of MPS users, if taken alone, has increased tremendously. Attracted by these numbers, prior literature focused mainly on the application of theories to explain consumer behavior related to intention to use and adopt MPSs (Matemba and Li, 2018). Scholars have examined the role of perceived security and personal innovativeness (Shaw, 2015a), age (Shaw, 2015b), perceived trust (Liebana-Cabanillas et al., 2014), and behavioral beliefs and perceptions (Yang et al., 2012; Zhou, 2015) leading to the adoption of MPSs. In comparison, fewer studies have examined the reasons behind the low use of MPSs.

Prior literature revealed that the slow adoption of any product or

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service is attributable largely to the resistance behavior of retail consumers (Hosseini et al., 2016). Resistance is a natural response toward innovations because of the possibility of bringing changes in existing lifestyles and upsetting the status quo (Ram and Sheth, 1989). Indeed, in retail, most innovations have to pass through the resistance phase. Some of these innovations fail at this point, while others that successfully cross the resistance phase become successful (Ram and Sheth, 1989). For instance, the introduction of computers also faced resistance because some consumers thought that computers would take human jobs, among other reasons. However, computers crossed the resistance phase and have become a dominant and inseparable part of human life today. It is crucial for organizations and service providers offering innovative consumer solutions to better understand the phenomenon of innovation resistance because resistance exhibited by retail consumers is a potential factor that can define the success or failure of the innovations in their target market space (Heidenreich and Kraemer, 2016). Moreover, the high rate of failure of new goods and services generates the need for businesses and service providers to have a firmer grasp of the phenomenon of retail customer resistance and of the factors that contribute to resistance (Antisco and Kleijnen, 2010; Heidenreich and Kraemer, 2016). In the area of information technology, user resistance is also a key issue (Rivard and Lapointe, 2012). However, despite this importance, evidence-based studies on better understanding retail consumer resistance toward MPSs are currently scarce.

Prior investigations have identified trust, lack of comprehensive features, awareness, security threats, lack of consumer experience in contactless transactions, infrastructure, and consistency issues as the possible reasons behind consumer resistance and slow growth in the use of MPSs (Hoeck, 2017). Moulds (2015) reasoned that security is a major roadblock in the acceptance and adoption of MPSs by retail consumers and is a great threat for potential MPS users. Similarly, Martin (2016) reasoned that the lack of special incentives, infrastructure, and seamless services, presence of diversity of MPSs in the market, security concerns, and ingrained retail consumer behavior are among the various reasons holding MPSs back. These observations clearly suggest the need to study the factors contributing to consumer resistance toward MPSs.

We attempt to address this gap by examining the factors that contribute to the slow adoption of MPSs. We utilize a popular theory, namely the innovation resistance theory (IRT; Ram and Sheth, 1989), to build a research model based on various barriers representing consumer resistance toward MPSs. Two research questions (RQs) addressed through the model are as follows: RQ1. Which IRT barriers are significant in the context of MPSs? RQ2. How do these barriers that existed prior to the adoption impact the future use and recommendation intentions of first-time MPS users? A large cross-sectional study with 1256 first-time MPS users from India was conducted to examine the proposed research questions. The novelty of this study comes from two aspects: First, it is among the few empirical studies so far to test the impact of IRT barriers on the adoption of MPSs by retail consumers in an emerging economy. Second, it is the first study to bring together preadoption resistance and postadoption intentions by surveying the first-time users of MPSs.

2. Theoretical background

2.1. Consumer resistance toward MPSs

The increased penetration of mobile devices and Internet have also revolutionized the way people are making financial transactions. In this regard, several MPSs (e.g., PayPal, PayTM, and LINE Pay) have emerged. The first MPS came into existence in the 1990s (Rampton, 2016). However, MPSs only received prominence over the past decade. This is evident from the fact, there has been a surge in the research specifically related to these payment methods. Most prior research initiatives involving MPSs intend to understand the factors influencing adoption and use (Sivathanu, 2018). In comparison, only a few attempts try to understand consumer resistance toward MPSs (Sivathanu, 2018). A review of prior extended MPS literature revealed that only four empirical studies have investigated consumer resistance toward MPSs (Sivathanu, 2018), including one study on mobile commerce (Moorthy et al., 2017; see Table 1). All four studies were carried out between 2016 and 2018, making it evident that the scholarly community is increasingly interested in examining consumer resistance toward MPSs.

The review of prior literature also revealed that the IRT was the natural choice among scholars for investigating consumer resistance toward MPS. However, some scholars have utilized other information systems (IS) and marketing theories, such as the innovation diffusion theory, valence framework, theory of planned behavior, and behavioral reasoning theory to complement IRT-based models. All these theories help in understanding consumer behavior toward online and offline products and services. In terms of geographical and cultural dimensions, most studies originated from Malaysia (Moorthy et al., 2017) and India (Sivathanu, 2018). In addition to this, prior empirical studies focused on a broad age group of MPS users, namely those 25–55 years old (Moorthy et al., 2017) and 25–45 years old (Sivathanu, 2018). In contrast, empirical studies investigating consumer resistance toward MPSs among specific user groups, such as adolescents and young adults, do not exist at the moment.

Furthermore, prior studies primarily examined the association of different consumer barriers (part of innovation resistance) with adoption intentions toward MPSs. Compared with this, limited focus is on postadoption issues, such as use intentions and intentions to recommend (ITR). So far, only one empirical research initiative has examined the association of consumer barriers with use intentions and actual use behavior toward MPSs (Sivathanu, 2018). In terms of research methodology, most studies have utilized some form of regression analysis (Moorthy et al., 2017), but one study utilized structural equation modelling (SEM; Sivathanu, 2018).

2.2. Innovation resistance theory (IRT)

The IRT offers a theoretical framework for customer resistance (Ram and Sheth, 1989); the theory helps in understanding the resistance-oriented behavior of users. Here, innovation resistance can be defined as behavior resulting from rational thinking and decision-making regarding the adoption and usage of innovation because of the possible changes brought by alterations to the existing status quo and deviations from the existing belief system (Hew et al., 2017). Consumer resistance can play a prominent role in shaping the success or failure of innovations (Ram and Sheth, 1989). The changes occurring in an individual’s life and behavior because of the use innovation can instigate resistance-oriented behavior among users (Ram and Sheth, 1989).

Customer resistance can also be understood as active and passive resistance (Heidenreich and Handrich, 2015). Active resistance is a resistive behavior that emerges from the characteristics of innovations, and it can be studied via functional barriers proposed by IRT (Yu and Chantatub, 2016). These represent the hurdles toward innovation adoption and usage resulting from the conflicts caused because of the behavioral contradictions arising from the use, value, and risk of the innovation (Yu and Chantatub, 2016). On the other hand, passive resistance emerges due to the conflicts with the existing beliefs, and it can be studied through psychological barriers proposed by IRT (Yu and Chantatub, 2016). There are two types of psychological barriers: tradition and image.

The comprehensiveness of the IRT makes it an appropriate framework for examining users’ resistance toward innovations (Ma and Lee, 2018). Moreover, the existing theoretical frameworks (e.g., diffusion of innovation and technology acceptance model) do not focus on examining resistance toward user innovations (Gupta and Arora, 2017). The focus of the IRT in explaining consumers’ response to any product in terms of barriers, such as usage, risk, value, tradition, and image,
This clearly indicates growing interest among the scholastic community in examining innovation resistance. Prior empirical studies utilized the IRT as the only theoretical frame among scholars to examine innovation resistance; for example, eight empirical studies were carried out between 2012 and 2018, wherein innovations will keep making their way into the market.

The literature traces various attempts to examine the importance of user innovation and barriers toward their adoption (Brahim, 2015). We conducted a review of the prior literature on innovation resistance toward different Internet-based services and products such as mobile gaming, mobile banking, and mobile commerce (see Table 2). A total of 13 empirical studies were carried out between 2012 and 2018, wherein researchers conducted seven empirical studies alone in 2017 and 2018. This clearly indicates growing interest among the scholastic community toward understanding the different barriers against the adoption and growth of various digitization initiatives.

Prior literature suggests that IRT has been the preferred choice among scholars to examine innovation resistance; for example, eight prior empirical studies utilized the IRT as the only theoretical framework (e.g., Borraz-Mora et al., 2017). Moreover, five empirical studies used other theoretical frameworks to complement the IRT, such as UTAUT2 (Lian and Yen, 2014), the innovation diffusion theory (Oktavianus et al., 2017), and the valence framework (Moorthy et al., 2017). Other than this, some scholars have utilized frameworks other than IRT to examine consumer resistance, such as the behavioral resistance theory (Gupta and Arora, 2017) and theory of planned behavior (Joachim et al., 2018).

The IRT has been used to investigate the barriers and resistance to toward different user innovations, such as online shopping (Lian and Yen, 2014), m-banking (Gupta and Arora, 2017), m-commerce (Hew et al., 2017), mobile services (Joachim et al., 2018), e-banking (Borraz-Mora et al., 2017), mobile gaming (Oktavianus et al., 2017), and online travel websites (Jansukpum and Kettem, 2015). In terms of geographical settings, researchers have carried out prior studies in different countries, including Malaysia (Moorthy et al., 2017), Taiwan (Oktavianus et al., 2017; Yu et al., 2015), Germany (Joachim et al., 2018), Finland (Laukkanen, 2016), Spain (Borraz-Mora et al., 2017), Thailand (Jansukpum and Kettem, 2015; Yu and Chantatub, 2016), and India (Gupta and Arora, 2017). In terms of demographic settings, most prior empirical studies have focused on a broad age group of consumers. However, only three empirical studies have focused on young adults (Jansukpum and Kettem, 2015; Lian et al., 2012; Oktavianus et al., 2017).

### 3. Research model and hypothesis

We used the IRT to formulate a research model for measuring how preadoption functional and psychological barriers impact the post-first use behavior of MPS users in terms of their intentions to continue to use and recommend it to others (see Fig. 1). The independent variables in our model are the five IRT barriers: usage, risk, value, image, and tradition barriers. The two dependent variables in our model are use intentions (UI) and the intentions to recommend (ITR). These dependent variables represent commonly used postadoption measures that capture the intentions of consumers to continue to use the product and spread positive word-of-mouth, which is an influential factor in adoption-related decision-making (Moldovan and Goldenberg, 2004). The seminal work on technology adoption suggests that negative word-of-mouth can have an adverse influence on service providers by delaying, or even permanently stalling, the diffusion process (Gurtner, 2014). Furthermore, consumers tend to engage in negative word-of-mouth when they are opposed to a change or are dissatisfied with the product or service (Moldovan and Goldenberg, 2004). To the best of our knowledge, there have been no previous attempts to examine the association among different functional and psychological barriers and users’ ITR for first-time MPS users. We argue that consumer barriers are negatively associated with the ITR of first-time MPS users. Prior literature also supports the contention. For example, John and Klein (2003) suggested that a clash with the users’ tradition and culture can result in negative word-of-mouth. In addition, other factors (e.g., the complexity, perceived risks, and so on) could also induce negative word-of-mouth or ITR. For these reasons, we examined the association of different user barriers with the intentions to recommend MPS. We also argue that consumer barriers are negatively associated with the continued use intentions of first-time MPS users.

### Table 1

<table>
<thead>
<tr>
<th>Author/Year</th>
<th>Sample</th>
<th>Theory</th>
<th>Context</th>
<th>Method</th>
<th>Study Measure</th>
<th>Hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sivathanu (2018)</td>
<td>766 Indian respondents (58% males) aged from below 25 years to above 45 years*</td>
<td>UTAUT2 &amp; IRT</td>
<td>MPS</td>
<td>PLS-SEM</td>
<td>USE, IRUDPS, AUDPS, PE, EE, SI, FC, HM, H</td>
<td>USE, IRUDPS (+)</td>
</tr>
<tr>
<td>Moorthy et al. (2017)</td>
<td>227 Malaysian respondents (46.26% males) aged between 35 to 55 years*</td>
<td>IRT &amp; Valence framework</td>
<td>Mobile commerce</td>
<td>Regression</td>
<td>USE, VAL, RK, TRAD, IMG, PCB, AI</td>
<td>USE, VAL, RK, TRAD, AI (+)</td>
</tr>
<tr>
<td>Low (2017)</td>
<td>200 respondents from Malaysia (62.5% males) aged between 35-55 years*</td>
<td>IRT</td>
<td>MPS</td>
<td>Regression</td>
<td>USE, RK, VAL, IMG, TRAD, PCB</td>
<td>USE, RK, VAL, AI (+)</td>
</tr>
</tbody>
</table>

Note: *Mean age not mentioned

**Barrier & Measures.** Actual usage of digital payment systems = AUDPS, Adoption intention = AI, Behavioral intention to use digital payment systems = BIUDPS, Effort expectancy = EE, Facilitating condition = FC, Habit = H, Hedonic motivation = HM, Image barrier = IMG, Information barrier = IB, Innovation resistance to use digital payment system = IRUDPS, Partial least squares = PLS, Perceived cost barrier = PCB, Performance expectancy = PE, Risk barrier = RK, Social influence = SI, Structural equation modelling = SEM, Tradition barrier = TRAD, Usage barrier = USE, Value barrier = VAL

**Theory:** Innovation resistance theory = IRT, Unified theory of acceptance and use of technology = UTAUT

Provides scholars with a theoretical basis for explaining resistance toward innovations. This becomes even more important because innovations will keep making their way into the market.

The literature traces various attempts to examine the importance of user innovation and barriers toward their adoption (Brahim, 2015). We conducted a review of the prior literature on innovation resistance toward different Internet-based services and products such as mobile gaming, mobile banking, and mobile commerce (see Table 2). A total of 13 empirical studies were carried out between 2012 and 2018, wherein researchers conducted seven empirical studies alone in 2017 and 2018. This clearly indicates growing interest among the scholastic community toward understanding the different barriers against the adoption and growth of various digitization initiatives.

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We used the IRT to formulate a research model for measuring how preadoption functional and psychological barriers impact the post-first use behavior of MPS users in terms of their intentions to continue to use and recommend it to others (see Fig. 1). The independent variables in our model are the five IRT barriers: usage, risk, value, image, and tradition barriers. The two dependent variables in our model are use intentions (UI) and the intentions to recommend (ITR). These dependent variables represent commonly used postadoption measures that capture the intentions of consumers to continue to use the product and spread positive word-of-mouth, which is an influential factor in adoption-related decision-making (Moldovan and Goldenberg, 2004). The seminal work on technology adoption suggests that negative word-of-mouth can have an adverse influence on service providers by delaying, or even permanently stalling, the diffusion process (Gurtner, 2014). Furthermore, consumers tend to engage in negative word-of-mouth when they are opposed to a change or are dissatisfied with the product or service (Moldovan and Goldenberg, 2004). To the best of our knowledge, there have been no previous attempts to examine the association among different functional and psychological barriers and users’ ITR for first-time MPS users. We argue that consumer barriers are negatively associated with the ITR of first-time MPS users. Prior literature also supports the contention. For example, John and Klein (2003) suggested that a clash with the users’ tradition and culture can result in negative word-of-mouth. In addition, other factors (e.g., the complexity, perceived risks, and so on) could also induce negative word-of-mouth or ITR. For these reasons, we examined the association of different user barriers with the intentions to recommend MPS. We also argue that consumer barriers are negatively associated with the continued use intentions of first-time MPS users.
Table 2
Prior literature on innovation resistance

<table>
<thead>
<tr>
<th>Author (Year)</th>
<th>Sample</th>
<th>Theory</th>
<th>Context</th>
<th>Method</th>
<th>Hypothesis</th>
<th>Study Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joachim et al. (2018)</td>
<td>153 respondents from Germany (64.05% male)@*</td>
<td>TPB</td>
<td>mobile services</td>
<td>SEM</td>
<td>VAL, USE, IMG</td>
<td>PsB (NB, ERB, IMG, SRB, FFB, PRB, USE, IB) and PB (VAL, Ch, TB, AB, CB, CxG, VB, RB, DB), USE, VAL, RK (PR, ER, FRT, TR), and PsB (SB, TRAD, IMG)</td>
</tr>
<tr>
<td>Oktavianus et al. (2017)</td>
<td>30 respondents from Taiwan (46.67% males) aged between 18-29 years and the mean age 24 years.</td>
<td>IDT, IRT</td>
<td>mobile gaming</td>
<td>Thematic analysis</td>
<td>USE, VAL</td>
<td>USE, VAL, RK (PR, ER, FRT, TR), and PsB (SB, TRAD, IMG)</td>
</tr>
<tr>
<td>Tan (2017)</td>
<td>200 respondents from Malaysia (52% males) aged between 18-45 years*</td>
<td>TAM, IRT</td>
<td>m-commerce</td>
<td>CFA, PC, MRA</td>
<td>PB</td>
<td>AI, MioU, PU, PB, Pile</td>
</tr>
<tr>
<td>Borraz-Mora et al. (2017)</td>
<td>214 respondents from Spain (42.99% males)@*</td>
<td>IRT</td>
<td>e-banking</td>
<td>PLS-SEM, heterotrait-monotrait correlations</td>
<td>VAL Non-AI</td>
<td>Non-AI, Gender, Channel (i.e. Internet &amp; Mobile), Inertia, CxG, VAL, RK</td>
</tr>
<tr>
<td>Hew et al. (2017)</td>
<td>209 respondents from Malaysia (56.5% males) aged between 15-50 years*</td>
<td>IRT</td>
<td>m-commerce</td>
<td>Covariance-based SEM, Variance-based SEM, and Artificial Neural Network</td>
<td>USE, VAL</td>
<td>AI, PrC, USE, VAL, RK, TRAD, IMG</td>
</tr>
<tr>
<td>Gupta and Arora (2017)</td>
<td>379 Indian respondents (51.71% male) from the age between 19-60 years*</td>
<td>BRT</td>
<td>m-shopping</td>
<td>SEM, CFA</td>
<td>RqGA</td>
<td>USE, RK, TRAD, Conv., Ubi., and Radv.</td>
</tr>
<tr>
<td>Yu &amp; Chantatub (2016)</td>
<td>Group 1: 1203 respondents from Thailand (44.4% males) aged between 20 to 65 years and above* Group 2: 658 respondents from Taiwan (50.8% males) aged between 20 to 65 years and above*</td>
<td>IRT</td>
<td>m-banking</td>
<td>PLS path analysis</td>
<td>Group 1: R, USE, VAL, RK, TRAD IMG</td>
<td></td>
</tr>
<tr>
<td>Laukkonen (2016)</td>
<td>1736 respondents from Finland (39.05% males) aged between 18-55 years*</td>
<td>IRT</td>
<td>m-banking</td>
<td>CFA</td>
<td>USE, VAL, RK</td>
<td>AI, MB, USE, RK, VAL, IMG, TRAD. Gender, Age, Income</td>
</tr>
<tr>
<td>Yu et al. (2015)</td>
<td>Group 1: 1203 respondents from Thailand (44.4% males) aged between 20 to 65 years and above* Group 2: 658 respondents from Taiwan (50.8% males) aged between 20 to 65 years and above*</td>
<td>IRT</td>
<td>m-banking</td>
<td>EFA</td>
<td>Groups 1: R (ve)</td>
<td>e-lifestyles, R, USE, VAL, RK, TRAD, IMG</td>
</tr>
<tr>
<td>Jannukpum and Kettem (2015)</td>
<td>415 respondent from Thailand (44.3% male) from the age group of 18-25 years*</td>
<td>IRT</td>
<td>e-tourism</td>
<td>SEM-PLS</td>
<td>Groups 2: R (ve)</td>
<td>USE, RK, VAL, TRAD, IMG, Onl. Exp., Ind. Tl. Exp., SInf, and CR.</td>
</tr>
<tr>
<td>Lian and Yen (2014)</td>
<td>Group1: 246 respondents from Taiwan (35.8% males) aged between under 20-35 years* Group2: 574 respondents from Taiwan (41.6% males) aged between 51- over 75 years*</td>
<td>UTAUT &amp; IRT</td>
<td>online shopping</td>
<td>PLS</td>
<td>Groups 1: UI (-ve)</td>
<td>PrEx, EEx, SInf, PC, USE, VAL, RK, TRAD, IMG, Online ShI</td>
</tr>
<tr>
<td>Lim et al. (2013)</td>
<td>320 respondents from Malaysia (58.7% males) aged between 54-72 years*</td>
<td>IRT</td>
<td>m-banking</td>
<td>PC, MRA</td>
<td>USE, VAL</td>
<td>U, USE, VAL, RK, IMG, FCB</td>
</tr>
<tr>
<td>Lian et al. (2012)</td>
<td>178 respondents (55.2% males) with majority of the users within the age range of 20 to 24 years* $</td>
<td>IRT</td>
<td>online shopping</td>
<td>Regression analysis</td>
<td>VAL, IMG</td>
<td>U, USE, VAL, RK, IMG, TRAD</td>
</tr>
</tbody>
</table>
Usage barriers address the obstruction caused by probable changes, specifically in the context of using new innovation compared with the existing systems (Ram and Sheth, 1989). For example, usage barrier represents the effort required for learning, and using the new system and the changes to the existing routine and habits. The complexity of MPSS can pose a potential challenge for users with low technical skills or experience of using MPSS.

Studies have shown that usage barriers share a negative association with user’s intention to adopt and use newer digital innovations, such as online shopping (Gupta and Arora, 2017; Lian and Yen, 2014), mobile commerce (Moorthy et al., 2017), mobile services (Joachim et al., 2018), and mobile banking (Borraz-Mora et al., 2017). On the same note, some studies have also found usage barriers to have a positive association with users’ resistance toward digitization related to innovations such as mobile banking (Yu and Chantatub, 2016; Yu et al., 2015) and e-tourism (Jansukpum and Kettem, 2015). Sivathanu (2018) found that usage barriers have a positive association with user resistance toward the adoption of MPSS among Indian consumers. A recent study by Oktavianus et al. (2017) indicated that usage barriers result in the discontinuation of digital innovations (e.g., augmented reality mobile gaming). On the contrary, Hew et al. (2017) suggest that usage barriers have a positive relationship with usage intentions toward mobile commerce, indicating that users’ intentions to use mobile social commerce are higher if the barriers related to usage are higher (e.g., increased complexity level).

Usage barriers are an important variable because the usage-related complexity of newer digital innovations can significantly jeopardize their chances of becoming mainstream innovations. Prior literature has also strengthened our argument because users’ inefficiency on account of literacy levels (Rahman, 2013) and the incompetency of mobile devices (Mahatanankoon and Vila-Ruiz, 2007) are known usage barriers. We argue that similar issues might provide momentum to the role of usage barriers in eroding the use and recommendation intentions toward MPSS among young adults in India. The above discussion leads to the following hypotheses:

**H1.** Usage barriers are negatively correlated with use intentions toward MPSS.

**H2.** Usage barriers are negatively correlated with ITR MPSS.
3.2. Value barriers

Value barriers refer to resistance resulting from inconsistency with the existing value system, specifically in the context of balancing between the cost of using the innovation and learning it in contrast with the offered benefits (Morar, 2013). To have low value barriers, MPSs should offer more value to users in lieu of their effort in learning and getting accustomed to using these systems.

The literature has found that value barriers share an association with user behavior related to resistance, adoption, and the use of different digitization initiatives. Most of the prior literature suggests that value barriers have a negative association with user intentions in various contexts, namely online shopping (Lian and Yen, 2014), mobile gaming (Oktavianus et al., 2017), mobile commerce (Moorthy et al., 2017), mobile services (Joachim et al., 2018), and mobile banking (Laukkanen, 2016). Similarly, researchers have found that value barriers have a positive association with user’s resistance toward mobile banking (Lim et al., 2015; Yu and Chantatub, 2016) and e-tourism (Jansukpum and Kettem, 2015). In the context of MPSs, Sivathanu (2018) also found that value barriers have a positive association with user resistance toward the adoption of MPSs. This leads to the following hypotheses:

H3. Value barriers are negatively correlated with use intentions toward MPSs.

H4. Value barriers are negatively correlated with ITR MPSs.

3.3. Risk barriers

Risk barriers deal with the resistance resulting from uncertainties that are a natural part of any innovation. Dunphy and Herbig (1995) suggested that innovation acceptance is based on the level of uncertainty posed by an innovation. For example, innovation acceptance becomes lower for innovations that involve higher levels of uncertainty. Ram and Sheth (1989) pointed out four different kinds of risks associated with innovation: physical, economic, functional, and social. In the case of MPSs, users might suffer from the risk of fraud, loss of money, poor Internet connectivity, or poor battery power of their smartphones.

The literature has found that risk barriers have a negative influence on users’ intentions and behavior. For example, risk barriers have a negative impact on adoption intentions in different domains, namely mobile commerce (Moorthy et al., 2017), online shopping (Lian and Yen, 2014; Lian et al., 2012), m-shopping (Gupta and Arora, 2017), mobile banking (Laukkanen, 2016), and mobile gaming (Oktavianus et al., 2017). In other words, higher risk barriers translate into negative user behaviors, such as resistance. The literature has confirmed that higher risk barriers result from the resistance toward various digitization initiatives, such as m-banking (Yu and Chantatub, 2016) and e-tourism (Jansukpum and Kettem, 2015). Similarly, in the context of MPSs, risk barriers exert a positive impact on consumer resistance (Sivathanu, 2018).

Risk barriers can become potential barriers against the acceptance, usage and intentions to recommend MPSs because of the uncertainties posed by them. MPSs involve uncertainties regarding security, privacy, and trust (Marett et al., 2015). For example, losing confidential information and creating security violations are among the possible risks. The literature has reported that risk barriers have a negative association with a user’s behavioral intentions to use and adopt digitization-related services (Luo et al., 2010). The lack of awareness about the security- and privacy-related aspects among potential and existing users when it comes to digitalized services could contribute to the existence of risk barriers (Luo et al., 2010). We believe that this might also hold true in the case of MPSs. The above discussion leads to the following hypotheses:

H5. Risk barriers are negatively correlated with use intentions toward MPSs.

H6. Risk barriers are negatively correlated with ITR MPSs.

3.4. Tradition barriers

Traditions shape the success of any good and service. Scholars have argued that traditions are strongly embedded in society, as well as in people’s lives, and any possible conflict with them results in strong backlash from consumers in the form of bad word-of-mouth, bad publicity, and boycotting (Andrew and Klein, 2003). Tradition barriers refer to the obstacles posed by any innovation if that innovation brings changes in a user’s existing routine, culture, and behavior (Eibadrawy et al., 2012). Tradition barriers also have a negative association with the adoption intentions of any new innovation (Antico and Kleijnen, 2010). For example, MPSs require users to make payments digitally, which contradicts traditional cash-based payment systems.

The literature on digitization has suggested that tradition barriers have a negative association with adoption intentions toward online shopping (Lian and Yen, 2014), mobile shopping (Gupta and Arora, 2017), mobile commerce (Moorthy et al., 2017), mobile gaming (Oktavianus et al., 2017), and m-banking (Laukkanen, 2016). In comparison, tradition barriers are positively associated with resistance toward m-banking (Yu et al., 2015) and e-tourism (Jansukpum and Kettem, 2015). In the Indian context, the usage of MPSs has brought about a significant change in the way of making payments. The traditional way involved making payments with cash, whereas MPSs make payments cashless, which involves using mobile devices. Moreover, prior research examining the adoption of MPSs immediately after the November 2016 demonetization episode in India suggested that tradition barriers are positively associated with a user’s resistance toward MPSs (Sivathanu, 2018). Compared with this, the present study examined the role of tradition barriers toward the user’s intentions to use and recommend MPSs quite some time after the demonetization drive in India. The time period is important because now the use of MPSs (such as PayTm) has become relatively mature compared with November 2016 when Sivathanu (2018) conducted his study. Consequently, we argue that tradition barriers may not share any significant association with use intentions and ITR:

H7. Tradition barriers are not correlated with use intentions toward MPSs.

H8. Tradition barriers are not correlated with ITR MPSs.

3.5. Image barriers

Image barriers deal with a negative impression of the innovation emerging from the perceived level of complexity associated with its usage or its origin (Lian and Yen, 2013). For example, MPSs are usually not considered secure by consumers, and this contributes toward building a negative image (Hayashi, 2012). Prior research has reported image as a barrier having a negative influence on users’ behavior regarding different digitization initiatives. For example, image has a negative association with user’s adoption-related intentions toward mobile banking (Laukkanen, 2016), mobile gaming (Oktavianus et al., 2017), mobile commerce (Moorthy et al., 2017), and mobile services (Joachim et al., 2018). In addition to this, image barriers result in consumer resistance toward mobile banking (Yu and Chantatub, 2016; Yu et al., 2015; Lim et al., 2013) and e-tourism (Jansukpum and Kettem, 2015). A similar relationship is true in the case of MPSs (Sivathanu, 2018). The above discussion leads to the following hypotheses:

H9. Image barriers are negatively correlated with use intentions toward MPSs.

H10. Image barriers are negatively correlated with ITR MPSs.
4. Method

4.1. Study participants

The cross-sectional data of first-time MPS users was used to test the research model. We developed the instrument for survey by adapting the existing IRT scales to the MPS context. Furthermore, we organized a qualitative study with 10 MPS users whom we asked to share their opinions about different barriers. We considered the qualitative study results while finalizing the measurement items of the five measures related to IRT. Before conducting the actual study, we carried out a pilot study with 20 young adults who represented our target user group. We used the feedback generated by the pilot study to improve the survey instrument. To collect data, we announced the study in different higher-level educational institutions in three different states in North India. The target institutions were those specializing in engineering and management subjects and hosting young adults between 19 and 27 years of age. We organized information sessions in the participating institutions, and non-users of MPSs who expressed willingness to use PayTm (a popular mobile wallet in India) or have at least used once recruited to participate in the study. Participants were informed about the research objectives and process. We conducted all the survey answering sessions inside the premises of the participating institutions, and these sessions were monitored and supervised by one of the authors of the present study. Moreover, participation was completely anonymous and voluntary, and we did not offer any incentive for participation. We obtained informed consent from every participant at the beginning of the study. In total, we collected 1256 complete responses from participants between 19 and 26 years old, with 83% being male respondents.

4.2. Data analysis

We conducted the data analysis using IBM SPSS 25 and IBM Amos 24. For the analysis first, we conducted the examination of the measurement model, followed by an inspection of the instrument validity and reliability. Afterward, we assessed the structural model by examining the statistical significance of the proposed hypotheses.

5. Results

5.1. Common method bias test

Since self-reported measures are prone to common method bias (CMB; Podsakoff et al., 2003), we examined our data for the same. Harman’s single factor test confirmed the absence of CMB-related issues by revealing that the single-factor CFA model did not explain more than 50% of the variance in the dependent variable. The marker variable technique also confirmed the absence of CMB.

5.2. Measurement model

The measurement model assisted in examining the reliability and validity of the survey instrument. The measurement model returned a good model fit: chi-square ($\chi^2$) ratio degrees of freedom ($\chi^2 / df$) = 3.46; comparative fit index (CFI) = 0.96; Tucker-Lewis index (TLI) = 0.95; root mean square error of approximation (RMSEA) = 0.04 (Hu and Bentler, 1999).

The study measures had sufficient content validity because we drew and adapted the items of the survey instrument from the literature to fit the present study context. Adapting the items from the existing literature indicates that various researchers have validated and reviewed these items. This provides proof of content validity. We also verified the face validity of the survey instrument through the pilot study.

Furthermore, the study measures possess sufficient convergent validity because (a) the factor loadings and average variance extracted (AVE) for measures were greater than 0.50 (Anderson and Gerbing, 1988; Fornell and Larcker, 1981); (b) the composite reliability (CR) for all the measures were more than 0.70 (except for the value barrier; Fornell and Larcker, 1981; see Tables 3 and 4). This also suggests that the study instrument also possesses sufficient internal reliability. The CR value for value barriers was 0.67, which is an acceptable internal reliability for exploratory studies like the present investigation.

The study measures also possess sufficient discriminant validity because (a) AVE was greater than the average shared variance (ASV) and maximum shared variance (MSV; see Table 4); (b) the square root of its AVE value was greater than the correlation value between any two constructs was less than 0.80 (Campbell and Fiske, 1959).

Table 3

<table>
<thead>
<tr>
<th>Study Measures (Reference)</th>
<th>Measurement items</th>
<th>CFA</th>
<th>SEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usage Barrier (UB)</td>
<td>UB1: MPS is convenient because the phone is usually with me (R)</td>
<td>0.72</td>
<td>0.72</td>
</tr>
<tr>
<td>(Laukkanen, 2016)</td>
<td>UB2: MPS is convenient because I can use it anytime (R)</td>
<td>0.82</td>
<td>0.81</td>
</tr>
<tr>
<td></td>
<td>UB3: MPS is convenient because I can use it in any situation (R)</td>
<td>0.75</td>
<td>0.74</td>
</tr>
<tr>
<td></td>
<td>UB4: MPS is convenient because it is not complex (R)</td>
<td>0.59</td>
<td>0.59</td>
</tr>
<tr>
<td>Value Barrier (VB)</td>
<td>VB1: MPS offers many advantages compared with handling my financial matters in other ways (R)</td>
<td>0.69</td>
<td>0.65</td>
</tr>
<tr>
<td>(Laukkanen, 2016)</td>
<td>VB2: The use of an MPS increases my ability to control my financial matters all by myself (R)</td>
<td>0.72</td>
<td>0.67</td>
</tr>
<tr>
<td>Risk Barrier (RB)</td>
<td>RB1: I fear that while I am using an MPS, I might type the information of the bill incorrectly</td>
<td>0.67</td>
<td>0.68</td>
</tr>
<tr>
<td>(Laukkanen, 2016)</td>
<td>RB2: I fear that while I am using an MPS, I may pay more money</td>
<td>0.71</td>
<td>0.71</td>
</tr>
<tr>
<td></td>
<td>RB3: I fear that while I am using an MPS, I may pay money to the wrong vendor</td>
<td>0.80</td>
<td>0.80</td>
</tr>
<tr>
<td>Tradition Barrier (TB)</td>
<td>TB1: I find it difficult to contact customer service at the MPS</td>
<td>0.63</td>
<td>0.63</td>
</tr>
<tr>
<td>(Laukkanen, 2016)</td>
<td>TB2: I find it difficult to get some information about MPS use</td>
<td>0.72</td>
<td>0.72</td>
</tr>
<tr>
<td></td>
<td>TB3: I find it difficult to get my problem resolved from an MPS service provider</td>
<td>0.78</td>
<td>0.78</td>
</tr>
<tr>
<td>Image Barrier (IB)</td>
<td>IB1: In my opinion, an MPS is often too complicated to be useful</td>
<td>0.76</td>
<td>0.76</td>
</tr>
<tr>
<td>(Laukkanen, 2016)</td>
<td>IB2: I have such an image that an MPS is difficult to use</td>
<td>0.77</td>
<td>0.77</td>
</tr>
<tr>
<td>Intentions to use (UI)</td>
<td>UI1: I expect my use of an MPS to increase in the future</td>
<td>0.76</td>
<td>0.76</td>
</tr>
<tr>
<td>(Johnsen, Kiser, Washington &amp; Torres, 2018)</td>
<td>UI2: I intend to use the MPS in the future</td>
<td>0.80</td>
<td>0.80</td>
</tr>
<tr>
<td></td>
<td>UI3: If I have an opportunity, I will use the MPS</td>
<td>0.81</td>
<td>0.81</td>
</tr>
<tr>
<td></td>
<td>UI4: I will always try to use the MPS</td>
<td>0.79</td>
<td>0.79</td>
</tr>
<tr>
<td></td>
<td>UI5: I plan to use the MPS frequently</td>
<td>0.70</td>
<td>0.70</td>
</tr>
<tr>
<td>Intention to Recommend (ITR)</td>
<td>ITR1: I will recommend the MPS to my friends</td>
<td>0.87</td>
<td>0.86</td>
</tr>
<tr>
<td>(Oliveira, Thomas, Baptista &amp; Campos, 2016)</td>
<td>ITR2: If I have a good experience with the MPS, I will recommend it to my friends</td>
<td>0.77</td>
<td>0.78</td>
</tr>
</tbody>
</table>

Note: SEM = Factor loadings structural model, CFA = Factor loadings structural model, (R) = Reverse coded items
Furthermore, a product or service should be available at any time and in any situation. Consequently, MPSs and other service providers should focus on making their products and services easy to use. The study investigated consumer resistance toward the use of MPSs among young-adult users in India. We employed the popular theoretical framework, the IRT, to study the association of different functional (i.e., value, usage, and risk) and psychological barriers (namely, tradition and image) with use intentions toward MPSs and ITR MPSs. We collected large cross-sectional data from 1256 young-adult MPS users to test the proposed hypotheses. The study brings new insights into consumer resistance and barriers toward user innovations and newer digitization initiatives, such as MPSs. Furthermore, the current study brings valuable insights into the challenges toward adoption and penetration of digitization initiatives.

H1 and H2 investigated whether usage barrier has negative association with use intentions toward MPSs and ITR MPSs. The study results support both hypotheses. This is in line with most of the literature available in different research contexts (Borraz-Mora et al., 2017; Janusukpum and Kettem, 2015; Joachim et al., 2017; Moorthy et al., 2017; Oktavianus et al., 2017; Sivathanu, 2018). Furthermore, the prior literature has shown that usage barriers share a negative association with intentions (Sivathanu, 2018; Yu and Chantathub, 2016). Risk barriers deal with various forms of uncertainties associated with user innovations. Scholars have argued that the acceptance and adoption of user innovations decrease if a higher level of uncertainty is prevalent (Dunphy and Herbig, 1995; Ram and Sheph, 1989). The use of MPSs is linked with different uncertainties or risks related to privacy, security, and theft. It may be that the latter forms of risk barriers and the ITR, was not supported. There are two possible reasons for this: First, the current study focused on the risks related to making wrong payments to another vendor and paying more than required (see Table 3). However, other digitization studies focused on the risks related to privacy, security, and theft. It may be that the latter forms of risk barriers share a significant association with the ITR. Second, there might be differences in the risk-averse attitudes of consumers because of which association of risk barriers with ITR is statistically insignificant. Seminal work on consumer recommendation behavior suggested that recommendation behavior has a neutral response toward relieving risks (Roselius, 1971), and risk-averse consumers consider recommendation behaviors more useful compared with their less risk-averse counterparts (Cunningham, 1967). Future studies could examine this association through a more in-depth study.

H3 and H4 examined whether value barrier is negatively associated with use intentions and ITR MPSs. The study findings find support for both hypotheses. Furthermore, value barrier is the most influential factor, having a negative association with use intentions and ITR MPSs. This is again consistent with prior research, which also suggests that value barriers share a negative relationship with use intentions (Lian and Yang, 2014; Moorthy et al., 2017; Joachim et al., 2018) and a positive association with consumer resistance (Jansukpum and Kettem, 2015; Sivathanu, 2018; Yu and Chantathub, 2016). A possible reason behind our finding could be that the Indian economy has made a large shift from being a cash-based to a cashless economy. As a result, different MPSs have come into existence. Hence, the Indian population, which is being encouraged or, in a way, forced to use MPSs, has several options to choose from. Thus, it is important that users find value when using their chosen MPS. If the chosen MPS fails to provide users with their desired value, then this could lead to discontinuation or switching. Consequently, MPSs and other service providers should support consumers in handling and controlling their financial affairs in different ways.

The study findings provide support for H5, confirming that risk barrier has a negative association with use intentions toward MPS. Here again, the findings match the research that has reported risk barriers as having negative association with intentions toward various user innovations (Moorthy et al., 2017; Oktavianus et al., 2017). Furthermore, the results are compatible with the prior literature that has confirmed a positive association between risk barriers and consumer resistance toward user innovations (Jansukpum and Kettem, 2015; Sivathanu, 2018; Yu and Chantathub, 2016). Risk barriers deal with various forms of uncertainties associated with user innovations. Scholars have argued that the acceptance and adoption of user innovations decrease if a higher level of uncertainty is prevalent (Dunphy and Herbig, 1995; Ram and Sheph, 1989). The use of MPSs is linked with different uncertainties or risks related to privacy, security, data, and money theft (Marett et al., 2015). Other possible risks could be sending money to the wrong vendor and paying more money than required for a transaction. These risks are negatively associated with use intentions (Hongxia et al., 2011). Consequently, service providers must take steps to alleviate risk-related concerns.

In contrast, H6, hypothesizing a negative association between risk barriers and the ITR, was not supported. There are two possible reasons for this: First, the current study focused on the risks related to making wrong payments to another vendor and paying more than required (see Table 3). However, other digitization studies focused on the risks related to privacy, security, and theft. It may be that the latter forms of risk barriers share a significant association with the ITR. Second, there might be differences in the risk-averse attitudes of consumers because of which association of risk barriers with ITR is statistically insignificant. Seminal work on consumer recommendation behavior suggested that recommendation behavior has a neutral response toward relieving risks (Roselius, 1971), and risk-averse consumers consider recommendation behaviors more useful compared with their less risk-averse counterparts (Cunningham, 1967). Future studies could examine this association through a more in-depth study.

### Table 4
Mean, standard deviation, convergent and discriminant validity (N = 1256)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
<th>CR</th>
<th>AVE</th>
<th>MSV</th>
<th>ASV</th>
<th>UI</th>
<th>VB</th>
<th>RB</th>
<th>UB</th>
<th>TB</th>
<th>IB</th>
<th>ITR</th>
</tr>
</thead>
<tbody>
<tr>
<td>UI</td>
<td>3.73</td>
<td>0.94</td>
<td>0.88</td>
<td>0.60</td>
<td>0.51</td>
<td>0.21</td>
<td>0.77</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VB</td>
<td>3.28</td>
<td>1.02</td>
<td>0.67</td>
<td>0.50</td>
<td>0.36</td>
<td>0.15</td>
<td>0.60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RB</td>
<td>2.58</td>
<td>1.02</td>
<td>0.81</td>
<td>0.51</td>
<td>0.16</td>
<td>0.06</td>
<td>-0.16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UB</td>
<td>3.64</td>
<td>0.89</td>
<td>0.81</td>
<td>0.52</td>
<td>0.42</td>
<td>0.18</td>
<td>0.59</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TB</td>
<td>2.80</td>
<td>0.95</td>
<td>0.85</td>
<td>0.53</td>
<td>0.48</td>
<td>0.10</td>
<td>-0.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IB</td>
<td>2.29</td>
<td>1.08</td>
<td>0.74</td>
<td>0.59</td>
<td>0.48</td>
<td>0.12</td>
<td>-0.14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITR</td>
<td>3.68</td>
<td>1.04</td>
<td>0.80</td>
<td>0.67</td>
<td>0.51</td>
<td>0.21</td>
<td>0.71</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: UI = Intentions, VB = Risk barrier, RB = Usage barrier, UB = Tradition barrier, TB = Image barrier, ITR = Intention to recommend

### Table 5
Confirmation of study hypotheses (N = 1,256)

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Path</th>
<th>β</th>
<th>p</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>UB → UI</td>
<td>-0.34</td>
<td>&lt;0.001</td>
<td>Yes</td>
</tr>
<tr>
<td>H2</td>
<td>UB → ITR</td>
<td>-0.44</td>
<td>&lt;0.001</td>
<td>Yes</td>
</tr>
<tr>
<td>H3</td>
<td>VB → UI</td>
<td>-0.53</td>
<td>&lt;0.001</td>
<td>Yes</td>
</tr>
<tr>
<td>H4</td>
<td>VB → ITR</td>
<td>-0.43</td>
<td>&lt;0.001</td>
<td>Yes</td>
</tr>
<tr>
<td>H5</td>
<td>RK → UI</td>
<td>-0.11</td>
<td>&lt;0.001</td>
<td>Yes</td>
</tr>
<tr>
<td>H6</td>
<td>RK → ITR</td>
<td>-0.02</td>
<td>n.s</td>
<td>No</td>
</tr>
<tr>
<td>H7</td>
<td>TB → UI</td>
<td>-0.05</td>
<td>n.s</td>
<td>No</td>
</tr>
<tr>
<td>H8</td>
<td>TB → ITR</td>
<td>-0.09</td>
<td>n.s</td>
<td>No</td>
</tr>
<tr>
<td>H9</td>
<td>IB → UI</td>
<td>-0.02</td>
<td>n.s</td>
<td>No</td>
</tr>
<tr>
<td>H10</td>
<td>IB → ITR</td>
<td>-0.01</td>
<td>n.s</td>
<td>No</td>
</tr>
</tbody>
</table>

Note: n.s = not supported, β = standardized regression weights, p = probability

**Hypothesis Path**

- **H1**: UB → UI
- **H2**: UB → ITR
- **H3**: VB → UI
- **H4**: VB → ITR
- **H5**: RK → UI
- **H6**: RK → ITR
- **H7**: TB → UI
- **H8**: TB → ITR
- **H9**: IB → UI
- **H10**: IB → ITR

**Support**

- Yes: Hypothesis supported
- No: Hypothesis not supported

**Note**

- *p < 0.001, **p < 0.01, *p < 0.05
significant association with use intentions and ITR MPSs. The study findings support both hypotheses. Our study results contradict most prior literature, which has suggested a significant negative association with intentions (Gupta and Arora, 2017; Laukkanen, 2016; Moorthy et al., 2017) and positive association with consumer resistance (Jansukpum and Kettem, 2015; Yu et al., 2015). We argue that the use of the considered MPS (namely, PayTm) had become relatively mature in India at the time we conducted the current study; consequently, tradition barriers did not play any significant role, unlike the findings of Sivathanu (2018). Our findings suggest that tradition barrier may act as a significant barrier at the introduction of any user innovation, but its association becomes insignificant as the innovation matures.

The study findings also did not support H9 and H10, which investigated the negative association of image barrier with intentions to use and recommend MPSs. These findings again contradict the prior literature on image barriers (Laukkanen, 2016; Moorthy et al., 2017; Oktavianus et al., 2017). The probable explanation for the insignificant role of image barriers could be the level of users’ technological orientation. The current study participants were young adults, who tend to be technology savvy and have a positive image of different technology-oriented social and commerce platforms (Kaur et al., 2016). Young adults are usually quite accustomed to using various forms of mobile applications (Mallat, 2007). Consequently, image barrier is less likely to play a significant role in their case. We measured image barrier using two items: the MPS being too complicated and the MPS being too difficult to use. This is consistent with the prior literature that suggested young adult MPS users do not identify MPSs with tags such as “hard to use” and “complicated to use” (Sivathanu, 2018).

7. Conclusion

The present study investigated the association between functional and psychological barriers on the one hand and the use intentions and ITR MPSs on the other hand. We use the theoretical framework of the IRT (Ram and Sheth, 1989) to build a model to address two RQs: RQ1.

Which IRT barriers are significant in the context of MPSs? RQ2. How do these barriers impact the future usage and recommendation intentions of first-time MPS users? The findings confirmed the association of usage and value barriers with both use intentions and ITR. However, the risk barriers are associated with intentions to use only. The two psychological barriers had no statistically significant association with either of the dependent variables.

7.1. Theoretical implications

The six important theoretical implications of our study are as follows: First, it contributes to the prior literature on consumer resistance toward Internet-based and mobile-application-driven services such as MPSs. In the past few years, scholars have shown increasing interest in better understanding consumer resistance. Consequently, the current study’s findings will add to this emerging yet limited field of research.

Second, the current study has extended the IRT by: (a) examining the relationship of different barriers with the use intentions and the ITR, (b) by testing the applicability of the IRT in an emerging market such as India, which is quite important because emerging markets are growing in prominence in the global economy, and (c) by confirming the suitability of the IRT to explain intentions to use and recommend innovations such as MPSs. For example, our theoretical model explained 58.6% of the variance in the ITR and 59.2% of the variance in use intentions.

Third, emerging markets such as India have witnessed the rapid introduction and growth of various information technology initiatives. However, evidence-based studies examining consumer resistance, specifically in the context of these markets, are limited at the moment. Prior literature examining consumer resistance toward MPS has looked into other cultural contexts, such as Malaysia (Low, 2017; Moorthy et al., 2017). Compared with this, only one prior study attempted to understand the association of barriers with the adoption of MPS in the Indian context (Sivathanu, 2018). However, Sivathanu (2018) carried out his study out immediately after the demonetization drive in India in...
November 2016, when the use of MPSs was quite new and awareness was low. In contrast, we carried out the present study more recently, when information about the benefits and issues related to MPSs has increased and the potential and existing users are in a better position to make more informed decisions.

Fourth, young adults from India who were first-time users of the selected MPS, namely PayTm, were the main focus of the current study. Prior literature focused on a broader age group of MPS users, for example, 25–55 years old or 19–72 years old (Moorthy et al., 2017; Sivathanu, 2018). Because of this, the applicability of the study findings to a specific age group of users, such as young adults or older adults, is not possible. The present study overcomes the gap by offering age-group specific insights.

Fifth, the present study has shed more light on two highly useful acceptance and adoption-related consumer behavior measures: use intentions and the ITR. The study results have shown that both measures share similar associations with usage and value barriers in the case of MPSs.

Finally, our study set-up can guide others who are interested in understanding the reasons behind the slower adoption rate of MPSs. Additionally, building on the base we provided, future researchers can focus on studying retail consumer loyalty and stickiness in the post-adoption phase, even when users are dissatisfied by any MPS. Such behavior is called inertia, which is a part of status quo bias (Samuelson and Zeckhauser, 1988) Notably, Kim and Kankanhalli (2009) invoked the status quo bias framework to evaluate user resistance at the pre-adoption stage.

7.2. Practical implications

Three main practical implications of our study are as follows: First, the study results provide knowledge about the influential factors that can help MPS service providers and organizations enhance the reach of their services or products. In this regard, the findings suggest that service providers should focus on reducing users’ perceptions regarding usage and value barriers. For example, service providers could try to develop simple-to-use products or services so that their introduction does not bring drastic change to the user’s daily usage patterns. Also, service providers should try to satisfy the user needs so that their consumers derive value by using any proposed product or service. The absence of both these barriers can encourage consumers to use and recommend their services. The understanding of these factors can create positive ITR and positive word-of-mouth which can assist in furthering the propagation of innovation by leveraging existing users’ experiences to convert non-users into potential users.

Second, service providers should also obtain information on the influential factors that could create positive intentions toward the use of MPSs. MPS services providers also need to be innovative to gain a competitive advantage by ensuring continued usage by initial adopters. For this purpose, they can focus not only on the factors that enhance usability and value, but also on factors that make users feel secure while using their services. For example, service providers can clearly inform users about (a) the nature of the transactions and information being used by their consumers and how that information will be utilized and (b) the ways to retrieve money or receive potential help and the expected time span for receiving their money back in the case of a failed transaction or loss.

Finally, the study results provide information for decision making regarding the marketing of retail product innovations. For example, risk is one of the important barriers and MPS users have concerns related to the security and privacy of their information and money. Therefore, if MPS service providers promote their MPSs only focusing on the level of convenience provided, then it is less likely to alleviate the security and privacy concerns of prospective consumers. Consequently, marketing should focus on risk barriers also and alleviate those concerns through their advertising and campaigns.

7.3. Limitations and future research directions

Despite making an interesting contribution, the present study suffers from some limitations. One of the most prominent limitations is the lack of generalizability of the study results. This is mainly because of the study sample and use of a particular form of MPS. The present findings reflect the behavior of Indian young adults with respect to a single MPS called Paytm. To overcome this limitation, future research can test our model using data collected from first-time users belonging to different age groups across different geographical and cultural boundaries. Even the literature has supported the need for the examination of user behavior in the context of MPSs in different cultural and social contexts (Su et al., 2018). Additionally, user behavior regarding other forms of MPSs, such as mobile banking and wire transfers, is a topic for further investigation. The second limitation is due to the study design as the cross-sectional data fails to capture the dynamic nature of retail consumer behavior. To overcome this limitation, future researchers can conduct a longitudinal study to acquire a better understanding of intentions and recommend MPSs. Furthermore, we recommend that other scholars extend our research findings by utilizing other suitable theoretical frameworks on consumer resistance, such as status quo bias and the prospect theory.

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Appendix A. Supplementary data

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References


