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ORIGINAL ARTICLE

An integrated framework for mobile payment in Pakistan: drivers, barriers, and facilitators of usage behavior

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Abstract

The research aims to investigate the impact of theoretical drivers, facilitators, and barriers on the intention to adopt m-payment. It further examines the impact of the intention to adopt m-payment on usage behavior. Partial least squares structural equation modeling was used based on a suitable sample of 408 participants in Karachi, Pakistan. The findings contribute to a greater understanding of the factors that influence customer decision-making and, as a result, the adoption intention of mobile payment in Pakistan. Instead of relying on a single theory, the performed study presents an inclusive strategy for researchers by combining three recognized theories connected to technology acceptance. This research is conducted on a limited number of participants in Karachi, Pakistan. The survey should be conducted also be conducted internationally to obtain more comprehensive results; it could also be beneficial to determine customer preferences toward mobile payment systems in other nations. Limited literature was found that argued the intention to adopt m-payment and its impact on user behavior in the Pakistani context. Moreover, no studies were found that reflected and discussed the impact of barriers, theoretical drivers, and facilitators on m-payment.

Keywords M-payment · Barriers · Facilitators · Intention · Usage behavior · PLS-SEM

Introduction

The rapid adoption of mobile phones worldwide has been one of the reasons for development in society. With the emerging trends in technology, mobile phones are now not restricted as communication devices. People use mobile phones for multiple reasons—one of them is online payments. With an increase in mobile phone usage, technology companies are concentrating on developing new services. One of those services includes online mobile payments (m-payments). Most mobile payment types include browser-based payments, in-app payments, mobile/wireless credit cards, and mobile wallets. As explained by Akhtar et al. (2019) and Farzin et al. (2021), mobile payment is a method that includes payment services that are performed through a mobile device.

To overcome the fears related to risks in m-payments, various academic researchers have confirmed that updated and regular privacy guidelines, user-friendly apps, and governmental support could help increase mobile payment usage (Anderson (2016). Although mentioned studies have revealed a positive image of m-payments, some studies (Ranmpton 2016) have highlighted that the growth of m-payment in developing countries is still slow. Thus, mobile payment adoption in Pakistan is still lower (Aslam et al. 2017). One of the reasons could be the superstitious nature of users from 3rd world countries when it comes to technology associated with money which could further develop stress while doing transactions (Aslam et al. 2017).

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Pakistan, a developing country, has still launched various m-payment apps for economic development. As m-payment is gaining success in developed countries, Pakistan is also adapting the technology as e-commerce is growing every day. The success of cellular networks in Pakistan, payment through an online platform was introduced in 2009 in Pakistan. With this rise in m-payments, this technology has become a branchless banking sector in Pakistan. Thus, with this boom in technology, m-payment is supported by various financial institutions and—providers.

M-payment supports traditional banking by enhancing its image, service, and quality. Hence, every bank in Pakistan now offers an independent online banking app. M-payment in Pakistan could provide various economic facilities that are the elements of socioeconomic development. M-payment services offer several chances for financial inclusion. The most famous and used m-payment apps include Mobile Banking, EasyPaisa, JazzCash, Upaisa, Payoneer, PayPak, MoneyGram, Western Union, and HBL-Konnect. Thus, the research aims to discuss the barriers, facilitators, and theoretical drivers of the intention to adopt M-payment in the context of Pakistan. It further highlights the impacts of intention to adopt M-payment on the usage behavior of customers.

Previous studies have discovered low awareness of m-payment in developing nations. Several works of literature have been conducted in the context of both developed and developing nations that are already using m-payment or will adopt the technology. In developed countries, the study of Pham and Ho (2015) has confirmed the importance and economic advantage of m-payment that highlights both the system and user-related features. Most of the mentioned studies have used system or user-related models to measure the intention and usage of mobile payments. According to the authors' knowledge, limited studies were found that argued the intention to adopt m-payment and its impact on user behavior in the Pakistani context. Moreover, no studies were found that reflected and discussed the impact of barriers, theoretical drivers, and facilitators on m-payment.

Therefore, the current study contributes to the literature by evaluating the barriers, theoretical drivers, and facilitators that have been individually discussed limitedly in Pakistan. Following the introduction, the second chapter, the literature review, discusses the analysis of the research question with an emphasis on the theoretical foundations of the paper's hypothesis. Further, the methodology's third chapter illustrates the techniques used to investigate the analysis. The fourth chapter discusses the data collection and the outcomes that are gathered. Finally, the research is concluded in the last section, which reflects the research outcomes, future suggestions, and the weaknesses of the paper for future studies.

Literature review

Theoretical background

In the past, many researches are available highlighting the intention to adopt mobile payment and its impact on user behavior. The available literature proves that there are a set of other variables that influence this intention. These variables are independent: barriers, facilitators, and theoretical drivers. The existing literature on the intention to adopt m-payment is based on the theory of reasoned action (TRA), Technology Acceptance Model (TAM), Diffusion of Innovations (DOI), and Unified Theory of Acceptance and Use of Technology (UTAUT). Thus, the theory TAM, DOI, and UTAUT are used to develop a conceptual model. The model was established by the variables from existing models and adding new ones relatable to m-payments.

According to (Islam et al. 2020), m-payment is a technology used for paying bills and various digital services using a mobile phone. In their research, Aslam et al. (2017) defined it as a payment method that utilizes a mobile device for commercial transactions. Moreover, Pham and Ho (2015) explained the whole process as any transaction conducted through a mobile device or network that leads to the transaction of values in exchange for information, services, and types of merchandise.

Technology acceptance model (TAM)

TAM is an information system theory that highlights how users come to receive and practice a specific theory. Various researchers have previously studied the theory of TAM. Fred Davis and Richard Bagozzi developed it. The theory explains the perceived facilitators mentioned in the conceptual model and introduces the perceived usefulness and perceived ease of use (Davis 1989). TAM is also an intention-based model that explains the intention to adopt specific technology as a useful predictor. The study of Di Pietro et al. (2015) has enlightened the explanatory power of TAM, maintaining reliable results. According to Di Pietro et al. 2015), TAM is beneficial in calculating the acceptance of technological systems.

Diffusion of innovation (DOI)

DOI is a theory explaining how, why, and to what degree a technology grows publicly. Everett Rogers, in 1962 proposed the theory of DOI (Rogers 1995). According to Rogers, diffusion is a method by which an innovation is linked among people. Innovation is an idea or practice that is perceived to be new and has to be adopted. The diffusion of innovation

theory proposes five characteristics that affect the acceptance and adoption of any innovation. These characteristics involve; relative advantage, compatibility, complexity, observability, and trialability. The innovation involving these characteristics is more likely to be readily adopted than other innovations (Di Pietro et al. 2015).

The unified theory of acceptance and use of technology (UTAUT)

UTAUT is a model of technology acceptance that Venkatesh introduced. The theory explains the intention of users to utilize a new information system and subsequent usage behavior (Venkatesh et al. 2003). The theory has four key characteristics: performance expectancy, effort expectancy, social influence, behavioral intention, and facilitating conditions. UTAUT captures the essential characteristics of eight previously proposed models and theories used to study technology usage behavior. The theory has been previously used by (Di Pietro et al. 2015) to study the usage behavior and intention to adopt technology in a broader context.

Why mobile payment in emerging economies?

Mobile payment has become an area of interest for business practitioners, financial mediators, and researchers among various mobile phone services. According to research by Rehman and Esichaikul, (2011), m-payment has played a significant role in economically developing the world. Thus, it is an advanced tool for the development of developing countries in the South Asian region (Kar 2021; Arjun et al. 2021; Grover and Kar 2020; Chhonker et al. 2018; Rana and Dwivedi 2022; Asrani and Kar 2022; Hoh et al. 2022; Tew et al. 2022; Rui et al. 2022; Lew et al. 2020; Hew et al. 2019; Raza et al. 2018; Ali et al. 2021). In Pakistan, various commercialized platforms provide mobile payment services. Moreover, the banks in Pakistan now offer the facility of branchless banking. People in Pakistan still prefer to pay through cash by avoiding such digital payment tools. Similarly, in the UAE, the Covid-19 pandemic forced financial institutions to adopt mobile payment to digitize the economic system (Al-Qudah 2022). The reason behind the adoption decision of mobile payment mentioned by various researchers is the issues associated with trust and security. Additionally, Afshan and Sharif (2016) claimed that another reason is a lower awareness rate of digital/mobile payments. In collaboration with banks, the Pakistani government is effortlessly working on promoting cashless transactions.

Hypothesis development

Impact of facilitators on intention to adopt mobile payment (INT)

Perceived innovativeness As Karjaluoto et al. (2014) mentioned, innovativeness is the readiness of a person to try new technology. A previous study by Yang et al. (2012) has confirmed that adopting new technology is founded on the Diffusion of Innovation model. The m-payment service is still a new technology for developing countries; innovativeness has an integral role in evaluating the intention to adopt new technology. The interest of consumers toward a new technology shows the significance of innovativeness on intention to adopt. Liébana-Cabanillas et al. (2015), in their study, have explained the role of innovativeness toward the acceptance of m-payment. Likewise, de Luna et al. (2017) have argued the impact of innovativeness on the intention to adopt. Based on the context mentioned above, the proposed hypothesis is generated:

H1a: Perceived Innovativeness has an impact on INT.

Perceived trust Mortimer et al. (2015) literature on e-commerce, information technology, and m-payment has highlighted the significance of trust concerning the adoption intentions of new technology. Research in marketing has studied the importance of trust. According to Liébana-Cabanillas et al. (2021), trust is the faith that an authority's promise is reliable and will fulfill its relational exchange commitments. Trust determines the accomplishment of the adoption of new technologies, such as in the context of m-payments. Mobile payment is more than just a modern technological innovation; it is also a tool to manage consumers' money and personal data. Since the transfers are connected to their digital accounts and wallets, users should trust the m-payment service provider and network with their money (Morawczynski and Miscione 2008). People hesitate to use confidential stock information, bank account information, and debit/credit card numbers on untrustworthy payment applications (Lawrence and Tar 2010). As a result, in developed countries, confidence will play an essential role in promoting mobile payment adoption. Based on the context mentioned above, the proposed hypothesis is generated:

H1b: Perceived Trust has an impact on INT.

Perceived ease of use According to Sampat (2016), perceived ease of use is related to an individual's perception that consuming a specific technology or system needs less struggle and is easy to use. This variable is also considered the most impactful in adopting new technology. Further, Kleivene (2018) claims that perceived ease of use impacts

self-efficacy and instrumentality simultaneously and affects the intention to adopt, and efficacy has been considered a motivation factor. Thus, this motivation directly impacts the intention to adopt, though perceived ease of use could also be individually assessed as an instrument to influence the intention. This way, intention further improves the behavior of the individual. Singh et al. (2020) studied the similar impact of variables, and the proposed hypothesis is generated:

H1c: Perceived Ease of Use has an impact on INT.

Perceived usefulness Various researchers have studied perceived usefulness. According to de Luna et al. (2019), perceived usefulness is the possibility of users using technology to progress their routine in an organizational context. It is considered a relative advantage that has been studied on numerous occasions. For this reason, Singh et al. (2020) reflects it as a degree to which an innovation is measured better than similar existing technologies. In the current study, m-payment offers various rewards over other payment methods. According to the Technology Acceptance Model, the effectiveness of a payment method directly affects the intention to use technology, and this relationship has been studied by Lara-Rubio et al. (2020). Based on the context mentioned above, the proposed hypothesis is generated:

H1d: Perceived Usefulness has an impact on INT.

Perceived satisfaction Perceived satisfaction is particularly relevant while evaluating a customer's experience when purchasing, receiving or using a service or product, which would be critical to the customer's long-term reactions promoting continuation purpose and commitment, wherever appropriate. Various research has focused on consumers' perceptions and experiences regarding technology use. Satisfaction is the level of desire resulting from individual performance. According to Zhou (2013), in the context of m-payment, satisfaction is a psychological reaction to the process of purchase or payment. Moreover, Liébana-Cabanillas et al. (2020) claim that this feeling is created during the interaction with a particular service provider.

On the other hand, perceived satisfaction is also an indicator of consumers' future technology usage. Few studies have examined how people have used mobile payments since they were adopted (Yuan et al. 2020). How a person plans to continue using application software (Hsu and Lin 2015) or, in either situation, the payment system in question, satisfaction forecasts a person's user acceptance (Shang and Wu 2017). Based on the context mentioned earlier, the proposed hypothesis is generated:

H1e: Perceived Satisfaction has an impact on INT.

Impact of theoretical drivers on intention to adopt mobile payment

The theoretical drivers are adapted from the Diffusion of Innovation by Everett Rogers. The DOI theory proposes five features that affect any innovation or technology adoption. These characteristics involve; relative advantage, compatibility, complexity, observability, and Trialability. Ali and Puah (2017) argued that DOI theory is a useful framework that could use technology adoption studies.

Relative advantage According to Rogers (2003), the relative advantage is how an invention is supposed to be better than the idea it succeeds. Various researchers have used this specific attribute. Some of those researches have been exemplified for a better understanding. For example, a study conducted by Hsu, Lu, and Hsu (2007) claims that accepting mobile internet has found a lead to influence the adoption intention. Moreover, Kim and Garrison (2009) evaluated that mobile wireless technology is significant for adoption and use. Thus, m-payment is more influential in developing countries. Based on the context mentioned above, the proposed hypothesis is generated:

H2a: Relative Advantage has an impact on INT.

Compatibility Compatibility is how an invention is perceived in terms of consistency, value, experiences, and potential adopters (Rogers 2003). Schierz et al. (2010) found that compatibly impacts consumers' usage intention. Moreover, Koenig-Lewis, Palmer, and Moll (2010) found compatibility as a predictor of intent to adopt and use in their research. Another study found that compatibility has an impact on the intention to use; hence, the proposed hypothesis is generated:

H2b: Compatibility has an impact on INT.

Complexity Complexity is the state of being complex or intricate. According to Rogers (2003), it highlights an innovation's level of difficulty and complexity. Frambach et al. (1995), Reviewing the adoption is a new service, displayed that complexity negatively impacts the intention to adopt. Another study by Lean et al. (2009) highlights that complexity negatively impacts the intention to adopt and use. The study by Brumec (2006) depicted that complexity had a negative impact on the intentions to adopt and use. Based on the context mentioned earlier, the proposed hypothesis is generated:

H2c: Complexity has an impact on INT.

Observability Observability is the degree to which the results or benefits of using new technology are noticeable to adopters. Research conducted by Rogers (2003) found that observability impacts the action of adoption. Furthermore, Ajili et al. (2012) examined the approach and intention to adopt and use; they also investigated that observability directly impacts the intention to adopt. Moreover, the study on the adoption of precision agricultural technology by Rezaei-Moghaddam and Salehi (2010) highlighted that observability impacts the intention to adopt new technology. Based on the context mentioned above, the proposed hypothesis is generated:

H2d: Observability has an impact on INT.

Trialability Trialability is the ease that allows the customers to try and test a new product or service. According to Rogers (2003), it is a degree with the option of experimentation for a limited time. The study by Lee et al. (2011) found that Trialability has influenced individuals to adopt e-learning systems. A Nigerian study by Odumeru (2012) explored that Trialability significantly impacts online recruiting technology, and Trialability affects the adoption of e-MBA in the survey of Rezaei-Moghaddam and Salehi (2010). Based on the context mentioned above, the proposed hypothesis is generated:

H2e: Trialability has an impact on INT.

Impact of barriers on intention to adopt mobile payment (INT)

Operational constraints According to Rogers (2003), when individuals find a new technology relatively challenging to use, they experience operational constraints. In the context of m-payment, the size of mobile phones could be difficult and troublesome to use. The interface and functional features also serve as obstacles to operating in low-income countries due to the high rates of technological illiteracy (Sheth and Ram 1989). According to discussions, the architecture of mobile devices is a significant factor in their unavailability to the vulnerable (Duncombe 2012). Including disturbingly poor technology literacy figures worldwide (Pal et al. 2020), the greatest obstacle to cell phone use is consumers' failure to use the technology effectively (Rouvinen 2006). In addition, users will have difficulty using payment apps due to recent interface formats requiring complex mobile handset features. Based on the context mentioned above, the proposed hypothesis is generated:

H3a: Operational constraints have an impact on INT.

Perceived risk Since the effects of consumer behavior cannot be predicted with precision, all consumer behavior carries some risk. The key reasons why m-payment schemes are riskier than other online payments, according to Ozturk et al. (2017) and Liébana-Cabanillas et al. (2019), include payment processing irregularities, a lack of transaction history and payment documents, and financial fraud. In a recent study of the critical inhibitors of m-payments adoption, Kalini et al. (2020) identified PR as the most significant downside from the purchaser's viewpoint, confirming the value of this partnership. On the other side, Shin (2010) documented user adoption behavior toward social networking sites. The study highlighted the importance of perceived security and privacy, which possessed distinctive features. In our study context, perceived risk may also be associated with perceived security and privacy. Later, Shin et al. (2022) extended the concept of security and privacy risk when users intend to disclose their personal information using online platforms. Additionally, the user's assumption that a digital financial transaction is subject to volatility is referred to as perceived risk, a recurring concept in m-payment. Consumers all over the world have been plagued by news of digital payment theft for years. Based on the context mentioned above, the proposed hypothesis is generated:

H3b: Perceived Risk has an impact on INT.

Stress Some customers may have a negative nature and consume anxiousness or worried while using new technology. This feeling may develop resistance toward accepting and adopting new technology Swilley, E. (2010). Venkatesh, Thong, and Xu (2012) measured the feeling of stress toward new technologies; they highlighted that anxiety and nervousness strongly resist recent changes and profoundly affect the acceptance and adoption of new payment services. Such customers or new users feel that new technology is risky to use, thus strongly impacting the adoption of m-payment. Based on the context mentioned above, the proposed hypothesis is generated:

H3c: Stress has an impact on INT.

Unavailability of facilitating condition The degree to which consumers know how to access the technology when supported by infrastructure is referred to as facilitating conditions (Venkatesh et al. 2012). It has often been mentioned in previous m-payment papers (Pal et al. 2018), mainly in developed nations where illiteracy has prevented people from benefiting. Facilitating conditions have been a significant influencer of attitudes toward adoption in surveys concentrating on consumers from poor communities (Raleting and Nel 2011).

Convenient conditions have recently been established as a factor in m-payment applications in studies conducted in developing countries. Most electronic payments necessitate

using a handset with Internet access for software installation and use and the users' working knowledge of the app and its compliance with other elements such as bank accounts or debit cards. These situations, on the other hand, are not every day in developed countries. As a result, we anticipate that the lack of enabling factors will play a significant role in developed countries. Based on the context mentioned above, the proposed hypothesis is generated:

H3d: Unavailability of facilitating condition has an impact on INT.

Impact of intention to adopt M-payment on usage behavior

Usage behavior is the continuous commitment toward any product. It is dependent on the level of use and the level of the initial adoption of the product. The usage behavior is highly impacted by the intention to adopt any technology. According to Park (1998), customers' usage behavior is high if the product has fewer barriers and many facilities. Moreover, the study of Kim et al. (2010) highlights that customers are more interested in how the technology works and are more willing to develop an increase in the uses for that technology. Based on the context mentioned above, the proposed hypothesis is generated:

H4: INT has an impact on Usage Behavior.

Methodology

Research model

Figure 1 demonstrates the model of the study. This model portrays the Facilitators, Theoretical drivers, and Barriers with their impact on the intention to adopt M-payment.

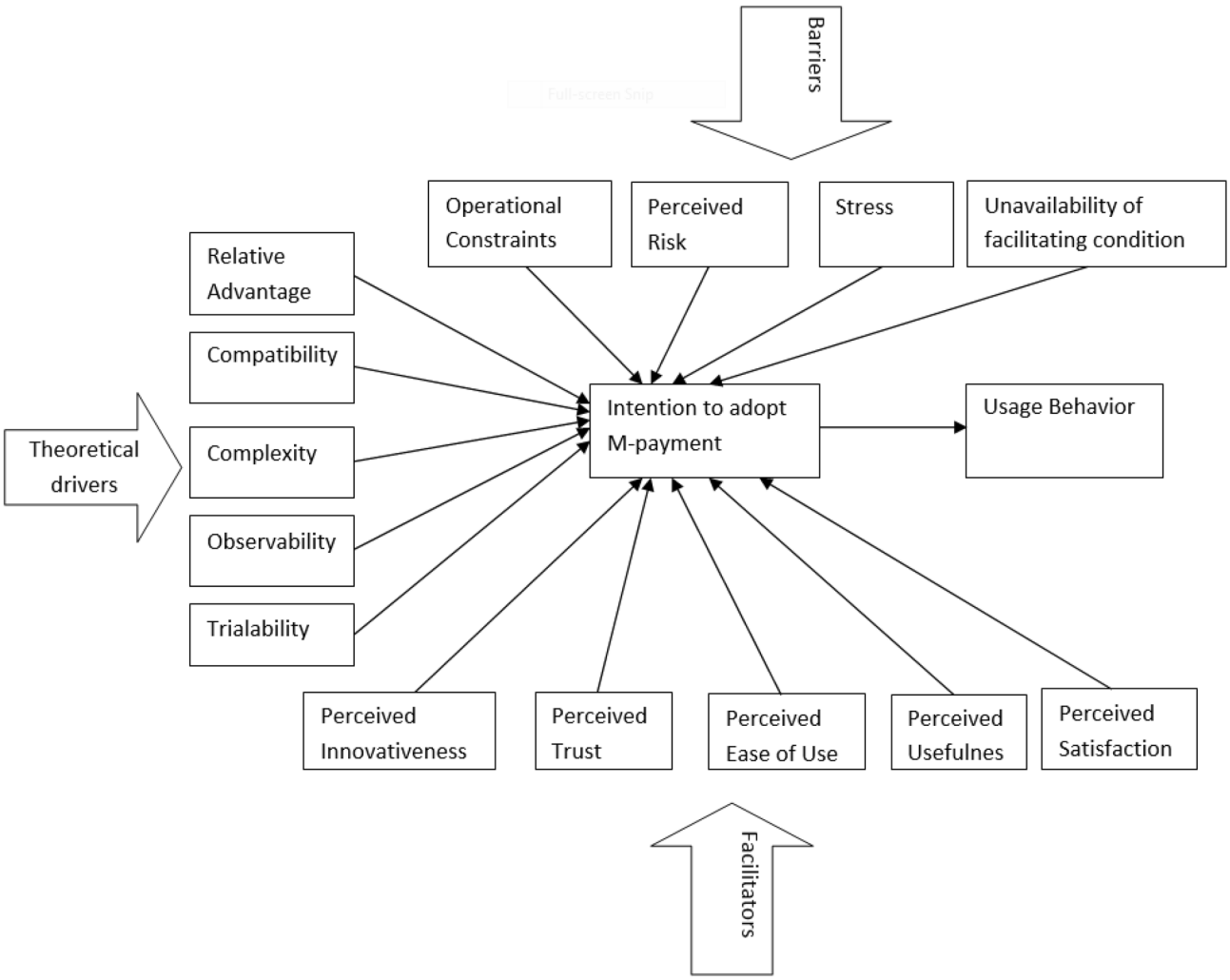

Fig. 1 Conceptual model

Furthermore, the impact of the intention to adopt M-payment on Usage Behavior is also studied (Fig. 2).

Data collection and measurement of variables

This research is based on the quantitative data collected through questionnaires. The data collection tool was established using a five-point Likert scale. The study targeted the general public for the survey. Survey questionnaires were distributed online in Karachi, Pakistan. In total, 421 respondents participated, and after data screening, 13 responses were deleted because of incomplete or missing values. The final sample size used in the study was 408. The sample size designated for the data was built on the rules offered by Raza and Hanif (2013), Comrey and Lee (2013), Raza et al. (2020a) Raza et al. (2020b).

The data collection instrument was developed using the items adapted from prior studies. For instance: *Perceived Innovativeness, Perceived Trust, Perceived Ease of Use, Perceived Usefulness, and Perceived Satisfaction* were adapted from previous studies (Liébana-Cabanillas et al. (2021). The items of *Relative Advantage, Compatibility,* Complexity, *Observability, and Trialability* were adapted from (Kapoor et al. (2015) and Makanyeza (2017). The *Operational Constraints, Perceived Risk, Stress, and Unavailability of facilitating conditions* were adapted from the study of Liébana-Cabanillas et al. (2020). The following studies have been used for the items of intention to adopt M-payment, i.e., (Baptista and Oliveira (2015) and Kim et al. (2010). Lastly, items of Usage Behavior were adapted from Liébana-Cabanillas et al. (2018).

Moreover, the research questionnaire comprised six sections. Section A includes fourteen items measuring Intention to Adopt Mobile Payment, and section B contains fifteen items measuring Barriers. Section C consists of three items measuring Facilitators, and section D comprise six items

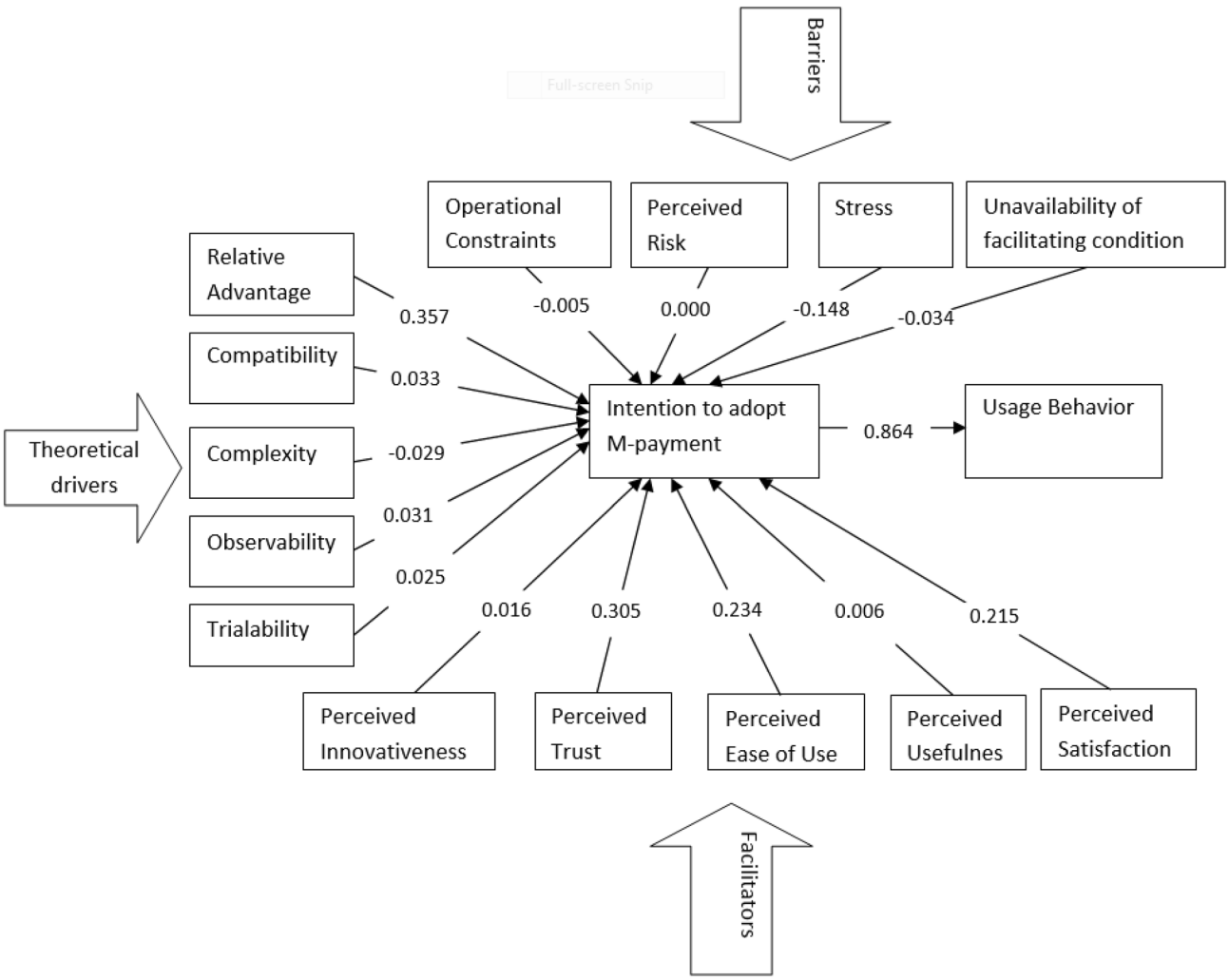

Fig. 2 Results of path analysis

measuring Theoretical Drivers. Further, section E includes five items of the usage behavior. At last, section F consists of demographic items such as gender, age, and education.

Demographics

The statistics of the participants are in Table 1. Referring to the demographic features, examining the gender ratio, the percentage of males is 67.9 percent, while the share of females is 32.1 percent. In terms of age, 31.6 percent of respondents are between the 20–26 age group, 38.7 percent of respondents are between the 27–33 age group, 15.0 percent of respondents are between the 34–40 age group, 7.6 percent respondents fall in the age bracket of 41–47, and remaining 7.1 percent are 48 and above. Regarding education, 32.1 percent of respondents were undergraduate, 38.5 percent were graduate, 27.5 percent were postgraduate, and 2.0 percent were at the option of others. Table 1 highlights the respondent profile of this research.

Data analysis

Structural equation modeling and the support of statistical facts are used to validate the theory (Ringle et al. 2005). For the variance-based method, PLS-SEM is used to process the hypothetical model. Additionally, bootstrap resampling is used according to the criteria of Hair et al. (2011), supported by Amin et al. (2022) and Raza et al. (2017a, 2017b).

Table 1 Respondent profile

Demographic items	Frequency	Percent
Gender		
Male	277	67.9
Female	131	32.1
Total	408	100
Age		
20–26	129	31.6
27–33	158	38.7
34–40	61	15.0
41–47	31	7.6
48 and above	29	7.1
Total	408	100.0
Education		
Undergraduate	131	32.1
Graduate	157	38.5
Post Graduates	112	27.5
Others	8	2.0
Total	408	100.0

Source: Author's estimation

Furthermore, the study compared variance and covariance-based techniques and concluded that the method has the least restrictions in sample size and residual distributions. Estimations are based on Anderson and Gerbing's (1998) two-step approach, i.e., measurement model and structural model.

Measurement model

Construct reliability, individual item reliability, convergent validity, and discriminant validity are in the measurement model to evaluate the proficiency of the model. Cronbach's Alpha, Composite reliability, and Average Variance Extract (AVE) are used to assess the results. The criteria of Straub (1989) are highlighted in the variables of Cronbach's alpha and composite reliability mentioned in Table 2. The criteria of Fornell and Larcker (1981) are used by average variance extracted (AVE) to calculate the convergent validity. Table 2 illustrates the findings for measurement model results.

Cross-loading analysis, the Fornell and Larcker criterion, and the heterotrait–monotrait ratio of correlations (HTMT) are used to measure the discriminant validity. Table 3 signifies the square root of AVE that is presented diagonally. Also, to explain the discriminant validity of adequacy, Table 4 displays loadings, and cross-loadings. This follows the criteria of (Gefen and Straub 2005). Moreover, the heterotrait–monotrait ratio of correlations (HTMT) is displayed in Table 5. Therefore, Tables 3, 4, and 5 demonstrate the results for the Fornell–Larcker criterion, cross-loading, and HTMT results to further strengthen the measurement model.

The measurement model approves convergent and discriminant validity and considers variables unique. Therefore, it is useful to inspect the structural model.

Structural model

In the structural model, hypotheses are verified, and the relationship between proposed constructs is inspected. The structural model is determined based on regression. Additionally, the standard significance can be seen in Table 6, there are 15 hypotheses. 10 depict the significant association from hypotheses, but the remaining 5 hypotheses display an insignificant relationship between the proposed variables. Hence, Table 6 shows the results of the path analysis.

Discussion

The path analysis H1a is related to Perceived Innovativeness and Intention to adopt M-payment. It is discovered that they have a positive but insignificant relationship ($\beta = 0.016$, $p > 0.1$), thus rejecting the hypothesis. The results are different from the generated hypothesis. According to

Table 2 Measurement model results

	Items	Loadings	Cronbach's alpha	Composite reliability	Average variance extracted
COMPT	COMPT1	0.837			
	COMPT2	0.838	0.803	0.882	0.714
	COMPT3	0.860			
COMPX	COMPX1	0.758	0.803	0.874	0.780
	COMPX2	0.992			
INT	INT1	0.971	0.940	0.971	0.943
	INT2	0.971			
OBSV	OBSV1	0.844			
	OBSV2	0.791	0.823	0.873	0.633
	OBSV3	0.839			
	OBSV4	0.701			
OPC	OPC1	0.697			
	OPC2	0.757			
	OPC3	0.745	0.828	0.869	0.571
	OPC4	0.820			
	OPC5	0.755			
PEU	PEU1	0.916			
	PEU2	0.970			
	PEU3	0.956	0.967	0.974	0.883
	PEU4	0.946			
	PEU5	0.909			
PINV	PINV1	0.722			
	PINV2	0.866	0.904	0.912	0.722
	PINV3	0.884			
	PINV4	0.914			
PR	PR1	0.899			
	PR2	0.836	0.802	0.875	0.701
	PR3	0.771			
PS	PS1	0.896			
	PS2	0.927			
	PS3	0.899	0.952	0.963	0.839
	PS4	0.922			
	PS5	0.936			
PT	PT1	0.922			
	PT2	0.930			
	PT3	0.875	0.941	0.955	0.810
	PT4	0.878			
	PT5	0.894			
PU	PU1	0.829			
	PU2	0.921	0.907	0.930	0.770
	PU3	0.911			
	PU4	0.846			
RA	RA1	0.935			
	RA2	0.933	0.960	0.969	0.862
	RA3	0.933			
	RA4	0.899			
	RA5	0.941			

Table 2 (continued)

	Items	Loadings	Cronbach's alpha	Composite reliability	Average variance extracted
STR	STR1	0.881			
	STR2	0.836			
	STR3	0.848	0.918	0.938	0.752
	STR4	0.854			
	STR5	0.914			
TRIL	TRIL1	0.882			
	TRIL2	0.912	0.909	0.936	0.786
	TRIL3	0.890			
	TRIL4	0.861			
UB	UB1	0.912			
	UB2	0.969			
	UB3	0.949	0.963	0.972	0.873
	UB4	0.939			
	UB5	0.899			
UoFC	UoFC1	0.796			
	UoFC2	0.852	0.874	0.905	0.705
	UoFC3	0.828			
	UoFC4	0.880			

INT Intention to adopt M-payment, *OPC* Operational Constraints, *PR* Perceived Risk, *STR* Stress, *UoFC* Unavailability of facilitating condition, *PINV* Perceived Innovativeness, Perceived Trust, *PEU* Perceived Ease of Use, *PU* Perceived Usefulness, *PS* Perceived Satisfaction, *RA* Relative Advantage, *COMPT* Compatibility, *COMPX* Complexity, *OBSV* Observability, *TRIL* Trialability, *UB* Usage Behavior

Liébana-Cabanillas et al. (2015), with differing results, for developing nations, m-payment services are still a new technology; innovativeness is critical in determining whether to accept new technology. Consumer demand in a new technology demonstrates the impact of innovation on adoption intentions. Another counter-intuitive finding in de Luna et al. 's (2017) study explains the importance of innovation in m-payment acceptability.

The path analysis H1b is related to Perceived Trust and Intention to adopt M-payment. It is discovered that they have a relationship of positive and significant ($\beta = 0.305$, $p < 0.01$), thus accepting the hypothesis. Similar results are shared by (Morawczynski and Miscione 2008). According to their study, Mobile payment is more than a new technological innovation; it is also a service that handles customers' money and sensitive data. Because the transactions are connected to their bank accounts, and the payment wallets hold some cash, customers should trust the digital payment provider and platform with their money.

The path analysis H1c is related to Perceived Ease of Use and Intention to adopt M-payment. It is discovered that they have a relationship of positive and significant ($\beta = 0.234$, $p < 0.01$), thus accepting the hypothesis. Similar results are found in the study of Singh et al. (2020). According to similar research, perceived ease of use influences self-efficacy, instrumentality, and the intention to adopt. On the other hand, perceived ease of use might be used as an individual tool to affect intent. In this approach, the individual's conduct is improved even more.

The path analysis H1d is related to Perceived Usefulness and Intention to adopt M-payment. It is discovered that they have a positive but insignificant relationship ($\beta = 0.006$, $p > 0.1$ thus rejecting the hypothesis. The results are different from the generated hypothesis and previous literature. In contrast, Lara-Rubio, Villarejo-Ramos, and Liébana-Cabanillas (2020) define it as a measure of how superior an invention is to its predecessor. According to the current research, m-payment has several benefits over traditional payment systems.

The path analysis H1e is related to Perceived Satisfaction and Intention to adopt M-payment. It is discovered that they have a relationship of positive but significant ($\beta = 0.215$, $p < 0.01$), thus accepting the hypothesis. Similar significant results are shared by Yuan et al. (2020); accordingly, satisfaction in the context of m-payment is a psychological reaction to the process of purchase or payment since satisfaction is the amount of desire arising from individual performance. Furthermore, according to Hsu and Lin (2015), this emotion develops through the contact between that particular bank and its benefits form-payment adoption.

The path analysis H2a relates to Relative Advantage and Intention to adopt M-payment. It is discovered that

Table 3 Fornell–Larcker criterion

	COMPT	COMPX	INT	OBSV	OPC	PEU	PINV	PR	PS	PT	PU	RA	STR	TRIL	UB	UoFC
COMPT	**0.845**															
COMPX	0.000	**0.883**														
INT	0.354	−0.056	**0.971**													
OBSV	−0.087	0.352	−0.039	**0.796**												
OPC	0.165	−0.039	0.400	−0.046	**0.756**											
PEU	0.316	0.030	0.825	−0.013	0.422	**0.940**										
PINV	0.036	0.056	0.064	0.019	0.020	0.058	**0.850**									
PR	−0.058	−0.057	−0.129	0.015	−0.080	−0.122	0.056	**0.837**								
PS	0.269	−0.065	0.786	−0.013	0.459	0.714	−0.001	−0.102	**0.916**							
PT	0.355	−0.055	0.865	−0.084	0.401	0.821	0.056	−0.126	0.767	**0.900**						
PU	−0.037	−0.068	−0.075	−0.045	−0.101	−0.127	−0.469	−0.026	−0.082	−0.093	**0.878**					
RA	0.311	−0.047	0.862	−0.068	0.388	0.767	0.047	−0.131	0.765	0.797	−0.040	**0.928**				
STR	0.242	−0.055	0.688	0.031	0.492	0.726	−0.010	−0.155	0.826	0.716	−0.092	0.698	**0.867**			
TRIL	0.318	−0.089	0.629	−0.010	0.472	0.586	0.035	−0.085	0.671	0.635	−0.066	0.614	0.651	**0.886**		
UB	0.353	−0.055	0.863	−0.068	0.428	0.931	0.027	−0.142	0.747	0.865	−0.071	0.822	0.772	0.605	**0.934**	
UoFC	0.034	−0.012	0.147	0.095	−0.064	0.140	0.002	−0.063	0.230	0.147	−0.076	0.206	0.186	0.204	0.124	**0.840**

INT Intention to adopt M-payment, *OPC* Operational Constraints, *PR* Perceived Risk, *STR* Stress, *UoFC* Unavailability of facilitating condition, *PINV* Perceived Innovativeness, Perceived Trust, *PEU* Perceived Ease of Use, *PU* Perceived Usefulness, *PS* Perceived Satisfaction, *RA* Relative Advantage, *COMPT* Compatibility, *COMPX* Complexity, *OBSV* Observability, *TRIL* Trialability, *UB* Usage Behavior. The diagonal elements (bold) represent the square root of the average variance extracted (AVE)

Table 4 Loadings and cross-loadings

	COMPT	COMPX	INT	OBSV	OPC	PEU	PINV	PR	PS	PT	PU	RA	STR	TRIL	UB	UoFC
COMPT1	**0.837**	−0.039	0.292	−0.077	0.151	0.264	−0.030	−0.089	0.222	0.301	0.026	0.261	0.181	0.278	0.297	0.094
COMPT2	**0.838**	0.000	0.343	−0.062	0.118	0.298	0.095	−0.029	0.267	0.334	−0.075	0.300	0.264	0.285	0.330	−0.036
COMPT3	**0.860**	0.047	0.246	−0.085	0.154	0.226	0.010	−0.030	0.177	0.250	−0.038	0.212	0.150	0.234	0.253	0.041
COMPX1	−0.011	**0.758**	−0.012	0.337	0.020	0.020	0.037	−0.075	−0.005	0.002	−0.084	−0.006	0.033	−0.038	0.003	0.002
COMPX2	0.002	**0.992**	−0.061	0.336	−0.048	0.030	0.057	−0.050	−0.073	−0.063	−0.061	−0.052	−0.068	−0.094	−0.063	−0.014
INT1	0.337	−0.070	**0.971**	−0.042	0.388	0.795	0.073	−0.126	0.764	0.833	−0.067	0.843	0.675	0.598	0.837	0.148
INT2	0.352	−0.038	**0.971**	−0.034	0.390	0.808	0.051	−0.126	0.763	0.848	−0.079	0.831	0.661	0.623	0.840	0.137
OBSV1	−0.093	0.319	−0.039	**0.844**	−0.089	−0.029	−0.005	0.027	0.004	−0.079	−0.010	−0.063	0.011	−0.037	−0.066	0.070
OBSV2	−0.035	0.306	−0.013	**0.791**	−0.083	−0.007	0.030	−0.034	−0.022	−0.058	0.005	−0.050	0.020	−0.032	−0.042	0.084
OBSV3	−0.081	0.248	−0.037	**0.839**	0.012	−0.006	0.032	0.016	−0.023	−0.074	−0.068	−0.063	0.028	0.009	−0.065	0.084
OBSV4	−0.020	0.285	−0.014	**0.701**	0.019	0.024	0.015	0.007	−0.006	−0.036	−0.070	−0.018	0.063	0.048	−0.015	0.076
OPC1	0.076	0.002	0.216	−0.078	**0.697**	0.204	−0.007	−0.034	0.247	0.244	0.012	0.218	0.289	0.137	0.238	−0.182
OPC2	0.073	0.013	0.221	−0.052	**0.757**	0.244	−0.020	−0.027	0.296	0.251	−0.019	0.230	0.295	0.180	0.254	−0.138
OPC3	0.085	−0.017	0.223	−0.099	**0.745**	0.216	0.017	−0.039	0.222	0.205	−0.014	0.197	0.248	0.104	0.219	−0.182
OPC4	0.193	−0.040	0.371	−0.004	**0.820**	0.380	0.025	−0.110	0.420	0.360	−0.147	0.351	0.463	0.526	0.365	0.002
OPC5	0.142	−0.070	0.387	0.004	**0.755**	0.436	0.038	−0.061	0.445	0.377	−0.128	0.380	0.456	0.574	0.440	0.105
PEU1	0.300	0.028	0.787	0.023	0.383	**0.916**	0.044	−0.114	0.706	0.773	−0.111	0.791	0.723	0.591	0.864	0.175
PEU2	0.322	0.023	0.811	−0.033	0.409	**0.970**	0.059	−0.123	0.707	0.790	−0.115	0.747	0.713	0.579	0.910	0.120
PEU3	0.308	0.014	0.810	−0.022	0.389	**0.956**	0.060	−0.100	0.670	0.781	−0.116	0.720	0.640	0.540	0.898	0.103
PEU4	0.284	0.016	0.773	−0.007	0.424	**0.946**	0.055	−0.116	0.648	0.792	−0.137	0.683	0.654	0.548	0.891	0.120
PEU5	0.267	0.063	0.687	−0.023	0.376	**0.909**	0.054	−0.122	0.618	0.718	−0.119	0.658	0.685	0.493	0.858	0.144
PINV1	0.034	−0.006	−0.008	0.012	0.012	0.019	**0.722**	−0.008	−0.020	−0.015	−0.432	−0.020	0.000	0.007	−0.018	0.078
PINV2	−0.009	0.057	0.038	0.041	0.008	0.013	**0.866**	−0.048	−0.021	0.025	−0.360	0.040	0.001	0.016	−0.006	0.014
PINV3	0.051	0.014	0.041	0.039	0.003	0.021	**0.884**	0.019	−0.020	0.039	−0.400	0.033	−0.009	0.020	−0.001	0.030
PINV4	0.043	0.063	0.070	−0.009	0.032	0.088	**0.914**	0.116	0.018	0.064	−0.473	0.041	−0.014	0.043	0.050	−0.012
PR1	−0.048	−0.050	−0.140	0.029	−0.061	−0.123	0.053	**0.899**	−0.100	−0.136	0.002	−0.140	−0.129	−0.081	−0.141	−0.019
PR2	−0.072	−0.052	−0.100	−0.013	−0.076	−0.110	0.025	**0.836**	−0.090	−0.089	−0.039	−0.099	−0.153	−0.070	−0.124	−0.111
PR3	−0.013	−0.039	−0.053	0.021	−0.075	−0.045	0.081	**0.771**	−0.050	−0.067	−0.055	−0.064	−0.102	−0.056	−0.061	−0.038
PS1	0.248	−0.024	0.723	−0.020	0.421	0.631	−0.003	−0.105	**0.896**	0.707	−0.074	0.689	0.736	0.605	0.653	0.175
PS2	0.271	−0.064	0.771	−0.031	0.417	0.702	0.014	−0.092	**0.927**	0.707	−0.061	0.724	0.738	0.630	0.726	0.178
PS3	0.206	−0.078	0.643	0.002	0.421	0.601	−0.007	−0.084	**0.899**	0.672	−0.080	0.669	0.764	0.620	0.642	0.242
PS4	0.234	−0.023	0.744	0.022	0.425	0.662	0.021	−0.116	**0.922**	0.706	−0.095	0.735	0.798	0.604	0.685	0.232
PS5	0.269	−0.115	0.708	−0.031	0.422	0.665	−0.034	−0.070	**0.936**	0.717	−0.065	0.681	0.748	0.616	0.710	0.235
PT1	0.321	−0.033	0.807	−0.023	0.336	0.763	0.047	−0.105	0.737	**0.922**	−0.093	0.736	0.690	0.571	0.815	0.159
PT2	0.342	−0.054	0.828	−0.062	0.399	0.745	0.032	−0.106	0.770	**0.930**	−0.075	0.747	0.694	0.576	0.787	0.189
PT3	0.322	−0.061	0.747	−0.059	0.349	0.659	0.070	−0.114	0.691	**0.875**	−0.066	0.678	0.683	0.550	0.712	0.100
PT4	0.290	−0.054	0.722	−0.097	0.356	0.730	0.046	−0.143	0.610	**0.878**	−0.120	0.678	0.563	0.555	0.743	0.105

Table 4 (continued)

	COMPT	COMPX	INT	OBSV	OPC	PEU	PINV	PR	PS	PT	PU	RA	STR	TRIL	UB	UoFC
PT5	0.320	−0.050	0.784	−0.141	0.364	0.796	0.058	−0.103	0.634	**0.894**	−0.069	0.744	0.588	0.605	0.834	0.103
PU1	−0.036	−0.090	−0.060	−0.048	−0.071	−0.114	−0.475	−0.017	−0.088	−0.074	**0.829**	−0.051	−0.091	−0.066	−0.063	−0.081
PU2	−0.040	−0.056	−0.072	−0.013	−0.084	−0.112	−0.451	−0.057	−0.058	−0.096	**0.921**	−0.031	−0.060	−0.053	−0.073	−0.002
PU3	−0.023	−0.043	−0.076	−0.057	−0.106	−0.122	−0.338	0.004	−0.079	−0.085	**0.911**	−0.036	−0.097	−0.066	−0.063	−0.124
PU4	−0.028	−0.051	−0.011	−0.059	−0.109	−0.050	−0.413	−0.018	−0.036	−0.032	**0.846**	0.020	−0.059	−0.015	0.000	−0.027
RA1	0.282	−0.006	0.808	−0.047	0.373	0.753	0.017	−0.126	0.769	0.785	−0.014	**0.935**	0.733	0.587	0.804	0.224
RA2	0.291	−0.043	0.811	−0.091	0.379	0.725	0.030	−0.109	0.743	0.759	−0.019	**0.933**	0.664	0.598	0.774	0.176
RA3	0.292	−0.076	0.784	−0.087	0.332	0.715	0.058	−0.138	0.657	0.705	−0.030	**0.933**	0.632	0.555	0.770	0.171
RA4	0.270	−0.035	0.723	−0.061	0.382	0.673	0.066	−0.146	0.631	0.708	−0.087	**0.899**	0.584	0.544	0.714	0.185
RA5	0.306	−0.057	0.863	−0.030	0.338	0.695	0.048	−0.098	0.741	0.740	−0.041	**0.941**	0.623	0.564	0.752	0.199
STR1	0.282	−0.038	0.717	0.026	0.354	0.739	−0.015	−0.152	0.702	0.737	−0.057	0.736	**0.881**	0.548	0.798	0.181
STR2	0.103	−0.094	0.470	0.089	0.331	0.501	−0.037	−0.109	0.668	0.512	−0.071	0.461	**0.836**	0.551	0.554	0.148
STR3	0.219	−0.030	0.561	0.036	0.454	0.563	−0.013	−0.129	0.686	0.576	−0.062	0.559	**0.848**	0.591	0.587	0.137
STR4	0.178	−0.022	0.570	−0.026	0.525	0.674	0.010	−0.152	0.739	0.594	−0.131	0.617	**0.854**	0.586	0.696	0.197
STR5	0.231	−0.064	0.617	0.022	0.472	0.627	0.004	−0.123	0.783	0.641	−0.080	0.600	**0.914**	0.555	0.668	0.140
TRIL1	0.226	−0.097	0.518	0.011	0.430	0.474	0.042	−0.088	0.581	0.522	−0.069	0.477	0.561	**0.882**	0.490	0.177
TRIL2	0.313	−0.064	0.634	−0.018	0.396	0.573	0.037	−0.081	0.654	0.609	−0.069	0.614	0.643	**0.912**	0.593	0.244
TRIL3	0.314	−0.083	0.555	0.011	0.397	0.493	0.009	−0.058	0.591	0.564	−0.015	0.555	0.550	**0.890**	0.526	0.135
TRIL4	0.266	−0.074	0.509	−0.039	0.461	0.532	0.035	−0.076	0.543	0.548	−0.084	0.516	0.543	**0.861**	0.528	0.158
UB1	0.342	−0.062	0.829	−0.042	0.381	0.839	0.006	−0.127	0.743	0.815	−0.044	0.843	0.765	0.603	**0.912**	0.157
UB2	0.358	−0.062	0.846	−0.083	0.416	0.908	0.025	−0.146	0.740	0.833	−0.058	0.805	0.764	0.601	**0.969**	0.105
UB3	0.343	−0.070	0.844	−0.082	0.391	0.899	0.030	−0.114	0.697	0.818	−0.061	0.764	0.675	0.550	**0.949**	0.082
UB4	0.313	−0.055	0.801	−0.054	0.431	0.893	0.031	−0.133	0.669	0.828	−0.091	0.725	0.689	0.562	**0.939**	0.102
UB5	0.285	0.002	0.698	−0.057	0.378	0.858	0.034	−0.143	0.632	0.740	−0.081	0.693	0.717	0.503	**0.899**	0.137
UoFC1	−0.016	−0.001	0.056	0.084	−0.059	0.063	0.020	−0.060	0.123	0.034	−0.038	0.112	0.097	0.134	0.027	**0.796**
UoFC2	0.014	−0.011	0.082	0.073	−0.069	0.090	0.038	−0.067	0.182	0.104	−0.061	0.177	0.166	0.193	0.082	**0.852**
UoFC3	0.008	0.017	0.107	0.111	−0.052	0.101	0.004	−0.024	0.170	0.096	−0.055	0.159	0.138	0.166	0.069	**0.828**
UoFC4	0.062	−0.029	0.177	0.065	−0.048	0.161	−0.021	−0.063	0.241	0.182	−0.080	0.205	0.186	0.182	0.162	**0.880**

INT Intention to adopt M-payment, *OPC* Operational Constraints, *PR* Perceived Risk, *STR* Stress, *UoFC* Unavailability of facilitating condition, *PINV* Perceived Innovativeness, Perceived Trust, *PEU* Perceived Ease of Use, *PU* Perceived Usefulness, *PS* Perceived Satisfaction, *RA* Relative Advantage, *COMPT* Compatibility, *COMPX* Complexity, *OBSV* Observability, *TRIL* Trialability, *UB* Usage Behavior. All self-loading is significant (bold)

Table 5 Heterotrait–monotrait ratio (HTMT)

	COMPT	COMPX	INT	OBSV	OPC	PEU	PINV	PR	PS	PT	PU	RA	STR	TRIL	UB	UoFC
COMPT																
COMPX	0.045															
INT	0.399	0.046														
OBSV	0.089	0.458	0.037													
OPC	0.184	0.083	0.418	0.106												
PEU	0.352	0.032	0.864	0.031	0.430											
PINV	0.067	0.044	0.048	0.042	0.036	0.043										
PR	0.081	0.082	0.133	0.044	0.092	0.125	0.070									
PS	0.299	0.061	0.828	0.035	0.478	0.741	0.028	0.108								
PT	0.400	0.055	0.809	0.090	0.423	0.860	0.044	0.133	0.807							
PU	0.065	0.090	0.067	0.064	0.103	0.120	0.528	0.049	0.080	0.088						
RA	0.346	0.043	0.804	0.068	0.402	0.795	0.042	0.137	0.797	0.837	0.047					
STR	0.263	0.065	0.729	0.058	0.523	0.761	0.024	0.174	0.884	0.758	0.097	0.730				
TRIL	0.364	0.085	0.676	0.052	0.459	0.622	0.034	0.096	0.719	0.684	0.067	0.653	0.712			
UB	0.392	0.044	0.425	0.067	0.441	0.376	0.024	0.147	0.777	0.513	0.066	0.853	0.811	0.642		
UoFC	0.081	0.024	0.136	0.118	0.192	0.134	0.058	0.083	0.232	0.133	0.074	0.209	0.192	0.219	0.111	

INT Intention to adopt M-payment, *OPC* Operational Constraints, *PR* Perceived Risk, *STR* Stress, *UoFC* Unavailability of facilitating condition, *PINV* Perceived Innovativeness, Perceived Trust, *PEU* Perceived Ease of Use, *PU* Perceived Usefulness, *PS* Perceived Satisfaction, *RA* Relative Advantage, *COMPT* Compatibility, *COMPX* Complexity, *OBSV* Observability, *TRIL* Trialability, *UB* Usage Behavior

Table 6 Results of path analysis

Hypothesis	Regression path	Effect type	Path coefficient	*p* value	Remarks
H1a	PINV—> INT	Direct Effect	0.016	0.431	Not Supported
H1b	PT—> INT	Direct Effect	0.305	0.000	Supported
H1c	PEU—> INT	Direct Effect	0.234	0.000	Supported
H1d	PU—> INT	Direct Effect	0.006	0.709	Not Supported
H1e	PS—> INT	Direct Effect	0.215	0.000	Supported
H2a	RA—> INT	Direct Effect	0.357	0.000	Supported
H2b	COMPT—> INT	Direct Effect	0.033	0.109	Not Supported
H2c	COMPX—> INT	Direct Effect	-0.029	0.111	Not Supported
H2d	OBSV—> INT	Direct Effect	0.031	0.064	Supported
H2e	TRIL—> INT	Direct Effect	0.025	0.426	Not Supported
H3a	OPC—> INT	Direct Effect	-0.005	0.755	Not Supported
H3b	PR—> INT	Direct Effect	0.000	0.298	Not Supported
H3c	STR—> INT	Direct Effect	-0.148	0.006	Supported
H3d	UoFC—> INT	Direct Effect	-0.034	0.067	Supported
H4	INT—> UB	Direct Effect	0.864	0.000	Supported

INT Intention to adopt M-payment, *OPC* Operational Constraints, *PR* Perceived Risk, *STR* Stress, *UoFC* Unavailability of facilitating condition, *PINV* Perceived Innovativeness, Perceived Trust, *PEU* Perceived Ease of Use, *PU* Perceived Usefulness, *PS* Perceived Satisfaction, *RA* Relative Advantage, *COMPT* Compatibility, *COMPX* Complexity, *OBSV* Observability, *TRIL* Trialability, *UB* Usage Behavior

they have a relationship of found positive and significant ($\beta = 0.357$, $p < 0.01$), thus accepting the hypothesis, according to the findings of a study by (Hsu, Lu, and Hsu (2007), adopting m-payment has discovered a relative benefit in influencing adoption intention. Furthermore, (Kim and Garrison (2009) concluded in their study that mobile wireless technology is essential for adoption and use, and m-payment is increasingly popular in underdeveloped nations.

The path analysis H2b is related to Compatibility and Intention to adopt M-payment. It is discovered that they have a positive but insignificant relationship ($\beta = 0.033$, $p > 0.1$), thus rejecting the hypothesis. Contrasting results are found as the generated hypothesis has been rejected. Lean et al.

(2009) and (Brumec 2006) discovered that compatibility considerably influenced customer usage intentions.

The path analysis of H2c is related to Complexity and Intention to adopt M-payment. It is discovered that they have a negative and insignificant relationship (β = -0.029, $p > 0.1$), thus rejecting the hypothesis. Similar results are found for the generated hypothesis. Pal et al.' s (2020) research on adopting a new service found that complexity negatively influenced adoption intentions. Another study by Sheth and Ram (1989) found that complexity negatively influenced adoption and usage intentions. According to Rouvinen's (2006) research, complexity negatively influences adoption and usage intentions.

The path analysis H2d is related to Observability and Intention to adopt M-payment. It is discovered that they have a relationship of positive and significant (β = 0.031, $p < 0.1$), thus accepting the hypothesis. Similar results are found in the prior literature. For example, research conducted previously discovered that observability affects adoption behavior. Furthermore, Ajili et al. (2012) evaluated the attitude and intention to adopt and use and the influence of observability on the intention to adopt. Furthermore, according to research on the adoption of precision agriculture technology, observability influences the desire to embrace new technology (Rezaei-Moghaddam and Salehi 2010).

The path analysis H2e is related to Trialability and Intention to adopt M-payment. It is discovered that they have a positive but insignificant relationship (β = 0.025, $p > 0.1$), thus rejecting the hypothesis. However, the generated hypothesis was rejected, and we found contrasting results. Trialability has impacted individuals to embrace e-learning systems. According to research by Odumeru (2012), Trialability has a considerable influence on online recruiting technologies, according to Rezaei-Moghaddam and Salehi (2010). Furthermore, trialability had a significant influence on the research of e-MBA uptake.

The path analysis H3a is related to Operational Constraints and the intention to adopt M-payment. It is discovered that they have a negative and insignificant relationship (β = -0.005, $p > 0.1$), thus rejecting the hypothesis. The contrasting results of Pal et al. 2020) highlight that the design and operational aspects frequently function as hurdles to utilization in low-income nations because of the high prevalence of digital illiteracy. According to debates, the design of mobile devices is a significant factor in their inaccessibility to the poor (Duncombe 2012).

The path analysis H3b is related to Perceived Risk and Intention to adopt M-payment. It is discovered that they have a positive but insignificant relationship (β = 0.000, $p > 0.1$), thus rejecting the hypothesis. The study of Ozturk et al. (2017) and Liébana-Cabanillas et al. (2019) found PR as a significant variable. This highlights that Perceived risk is a term used frequently in mobile banking to describe a user's opinion that a digital financial transaction is subject to danger (Zhou 2019). Users throughout the world have been concerned by news about digital payment fraud for decades.

The path analysis H3c is related to Stress and Intention to adopt M-payment. It is discovered that they have a relationship of negative but significant (β = -0.148, $p < 0.01$), thus accepting the hypothesis. Venkatesh, Thong, and Xu (2012) measured the feeling of stress toward new technologies; they found that stress and nervousness strongly resist new changes and profoundly affect the acceptance and adoption of new payment services. Such customers or new users feel that new technology is risky to use, thus strongly impacting the adoption of m-payment.

The path analysis H3d is related to the unavailability of facilitating conditions and the intention to adopt M-payment. It is discovered that they have a relationship of negative but significant (β = -0.034, $p < 0.1$), thus accepting the hypothesis. Venkatesh et al. (2012) have found a significant association between the unavailability of facilitating conditions and the intention to adopt. It emphasizes that digital resources necessary to run technology, such as facilitating infrastructure and digital literacy rates, are typically low in developing nations. Therefore, the lack of enabling conditions is critical (Pal et al. 2018).

The path analysis H4 is related to the impact of the intention to adopt M-payment on Usage Behavior. It is discovered that they have a relationship of positive but significant (β = 0.864, $p < 0.01$), thus accepting the hypothesis. The results are similar to Kim et al. (2010) study. It highlights that customers are more interested in how the technology works and are more willing to increase that technology.

Theoretical implications

The research findings contribute to a greater understanding of the factors that influence consumer decision-making and, as a result, the adoption intention of mobile payment in Pakistan. Instead of relying on a single paradigm, the performed study presents an inclusive strategy for researchers by merging three recognized theories connected to technological acceptance. TAM, DOI, and UTAUT are the theories that established the conceptual model. As a result, the literature focuses on how people perceive technology. The current study fills a gap in the literature by integrating theoretical causes, impediments, and facilitators. This means that while looking at the factors that influence m-payment acceptance, we should concentrate on the variables based on the chosen theories.

Practical implications

The main problem with m-payment in Pakistan is that it is inactive. As a result, a strong sense of m–payment

acceptance and active user involvement is required. The research has demonstrated the importance of theoretical drivers, impediments, and facilitators in resolving the m-payment issue in Pakistan. The findings may be utilized to create well-known marketing strategies, business models, swiftly processed plans, awareness programs, and updated initiatives aimed solely at Pakistan's lower-income and less-educated citizens. The findings aid financial institutions and mobile service providers in formulating new plans at the national level to reduce uncertainty connected with impartial facilitators for mobile payments. This might eventually benefit Pakistan's new m-payment consumers.

Facilitators influence customers, and the performance of m-payments is influenced by facilitators. In addition to facilitators, drivers such as relative advantage, compatibility, complexity, observability, and trialability have a role. This emphasizes the importance of concentrating on the challenging aspects of mobile phones, such as complex input, tiny screens, design difficulties, and easy-to-use interfaces.

As m-payment usage in Pakistan is still growing, there is a need to launch efficient marketing initiatives to encourage mobile payment. Consumers can influence customers decisions to use m-payments by raising awareness, which will have various implications on user behavior. This might be accomplished by stressing the benefits and ensuring that the m-payment service improves user experience, provides rapid development, minimizes risks, and provides wider accessible opportunities.

M-payment is now getting much attention in Pakistan. However, the major hindrance is its intention of adoption, which is majorly related to the service's privacy, safety, and security. The local service providers and banks should consider this aspect and ensure that trust and ethics are maintained. This needs the process of communication with the user at regular intervals. Moreover, this includes renewing client protection policies in banks and other m-payment service providers. Furthermore, the Intention barriers to adopting m-payment concluded that banks should facilitate their customer 24/7 with highly qualified representatives. Thus, by focusing on the provided facilitators.

The research can be useful for banking firms and their communications managers regarding practical ramifications. The study recommends that marketing and operations managers improve expectations of ease of use and create confidence in conventional cash-mode payment customers. To summarize, the most crucial factors that consumers consider when promoting m-payment are ease of use and trust. It is also beneficial for the state and related agencies to ensure transparency in financial and banking transactions through mobile payment systems, which can assist developed countries in preventing corruption and financial fraud.

As a result, this study is mainly helpful for banks and financial institutions. Bank executives may develop practical approaches by informing people around the country that m-payments are simple to use and increase the bank's confidence among Pakistani customers. In addition, tech engineers and service providers should create cutting-edge software and services for banking operations, especially in Pakistan. This forward-thinking initiative would aid in the introduction of mobile banking. Due to their various infancy in Pakistan, micro-financial institutions can also offer new applications and simple services for m-banking.

Conclusion

The study aimed to investigate the impact of theoretical drivers, facilitators, and barriers to adopting m-payment. It further examines the impact of the intention to adopt m-payment on usage behavior. Furthermore, the facilitators included Perceived Innovativeness, Perceived Trust, Perceived Ease of Use, Perceived Usefulness, and Perceived Satisfaction. Theoretical drivers included Relative Advantage, Compatibility, Complexity, Observability, and Trialability. Lastly, barriers studied included Operational Constraints, Perceived Risk, Stress, and Unavailability of facilitating condition.

This research is limited to a selection of participants in Karachi, Pakistan. The survey should be conducted nationally to obtain more comprehensive results; it could also be beneficial to determine customer preferences toward mobile payment systems in other nations. A cross-cultural analysis will be also helpful in obtaining more generally applicable customer behavior data on mobile payment services. Another thing worth noting is that the group mainly comprises young, skilled traditional technology consumers.

This type of sample may significantly impact the study's findings. Future studies could also look at the perspectives of non-users of mobile apps and see what affects their actions. First and foremost, the current research is constrained by its small sample size. Since the time available to complete this experiment was minimal, the report recommends combining a similar framework with a greater sample size. Second, the current study used urban data; a potential suggestion may be to compare the behavioral and technical facets of m-banking acceptance in rural and urban areas. Finally, we carried out this study in Pakistan, where m-banking is increasingly rising but still in its infancy. Our findings may apply to similar situations but cannot be applied to countries where digital marketing is more developed.

Declarations

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

References

Afshan, S., and A. Sharif. 2016. Acceptance of mobile banking framework in Pakistan. *Telematics and Informatics* 33 (2): 370–387.

Ajili, A., S. Salehi, K. Rezaei-moghaddam, D. Hayati, and F. Karbalaee. 2012. Estimating the model of investigating attitude and intention in the usage of variable rate irrigation technology. *Journal of Experimental Agriculture International*, pp. 542–556.

Akhtar, S., M. Irfan, A. Sarwar, and Q.U.A. Rashid. 2019. Factors influencing individuals' intention to adopt mobile banking in China and Pakistan: The moderating role of cultural values. *Journal of Public Affairs* 19 (1): e1884.

Al-Qudah, A. A., M. Al-Okaily, G. Alqudah, and A. Ghazlat. 2022. Mobile payment adoption in the time of the COVID-19 pandemic. Electronic Commerce Research, pp. 1–25.

Ali, M., S. A. Raza, B., Khamis, C. H. Puah, and H. Amin, 2021. How perceived risk, benefit and trust determine user Fintech adoption: A new dimension for Islamic finance. Foresight.

Ali, M., and C.-H. Puah. 2017. Acceptance of Islamic banking as innovation: A case of Pakistan. *Humanomics* 33 (4): 499–516.

Amin, H., T. Ramayah, D. Suhartanto, M. Ali, D.A. Razak, and M.Z. Muhammad. 2022. Investing in islamic fixed deposit accounts: A technology acceptance model perspective. *International Journal of Business and Society* 23 (2): 786–801.

Anderson, J.C., and D.W. Gerbing. 1988. Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin* 103 (3): 411.

Anderson, M. 2016. Technology device ownership: 2015. 2015 Available at: www. Pew internet. Org/2015/10/29/technology-device-ownership-2015. *Accessed September*, *1*.

Arjun, R., A. Kuanr, and K.R. Suprabha. 2021. Developing banking intelligence in emerging markets: Systematic review and agenda. *International Journal of Information Management Data Insights* 1 (2): 100026.

Aslam, W., M. Ham, and I. Arif. 2017. Consumer behavioral intentions towards mobile payment services: An empirical analysis in Pakistan. *Market-Tržište* 29 (2): 161–176.

Asrani, C., and A. K. Kar. 2022. Diffusion and adoption of digital communications services in India. Information Technology for Development, 1–23.

Baptista, G., and T. Oliveira. 2015. Understanding mobile banking: The unified theory of acceptance and use of technology combined with cultural moderators. *Computers in Human Behavior* 50: 418–430.

Brumec, S. 2006. Predicting the intention to use Internet–A comparative study. *Journal of Information and Organizational Sciences* 30 (1): 13–28.

Chin, W.W. 1998a) Commentary: issues and opinion on structural equation modeling.

Chin, W.W. 1998b. The partial least squares approach to structural equation modeling. *Modern Methods for Business Research* 295 (2): 295–336.

Chhonker, M.S., D. Verma, A.K. Kar, and P. Grover. 2018. m-commerce technology adoption: Thematic and citation analysis of scholarly research during (2008–2017). *The Bottom Line* 31 (3/4): 208–233.

Davis, F. D. 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, pp. 319–340.

De Luna, I.R., F. Liébana-Cabanillas, J. Sánchez-Fernández, and F. Muñoz-Leiva. 2019. Mobile payment is not all the same: The adoption of mobile payment systems depending on the technology applied. *Technological Forecasting and Social Change* 146: 931–944.

De Luna, I.R., F. Montoro-Ríos, F. Liébana-Cabanillas, and J.G. de Luna. 2017. NFC technology acceptance for mobile payments: A Brazilian Perspective. *Revista Brasileira De Gestão De Negócios* 19 (63): 82.

Di Pietro, L., R.G. Mugion, G. Mattia, M.F. Renzi, and M. Toni. 2015. The integrated model on mobile payment acceptance (IMMPA): An empirical application to public transport. *Transportation Research Part C: Emerging Technologies* 56: 463–479.

Duncombe, R. 2012. Understanding mobile phone impact on livelihoods in developing countries: A new research framework.

Farzin, M., M. Sadeghi, F.Y. Kharkeshi, H. Ruholahpur, and M. Fattahi. 2021. Extending UTAUT2 in M-banking adoption and actual use behavior: Does WOM communication matter? *Asian Journal of Economics and Banking* 5 (2): 136–157.

Frambach, R.T., H.G. Barkema, B. Nooteboom, and M. Wedel. 1998. Adoption of a service innovation in the business market: An empirical test of supply-side variables. *Journal of Business Research* 41 (2): 161–174.

Grover, P., and A.K. Kar. 2020. User engagement for mobile payment service providers–introducing the social media engagement model. *Journal of Retailing and Consumer Services* 53: 101718.

Gefen, D., and D. Straub. 2005. A practical guide to factorial validity using PLS-Graph: Tutorial and annotated example. *Communications of the Association for Information Systems* 16 (1): 5.

Hair, J.F., C.M. Ringle, and M. Sarstedt. 2011. PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice* 19 (2): 139–152.

Hoh, P. Y., S. J. Loo, G. W. H. Tan, V. H. Lee, E. C. X., Aw, T. H., Cham, and K. B. Ooi. 2022. Understanding Valences in Mobile Grocery Shopping: Do Consumers' Characteristics Matter?. Journal of Computer Information Systems, pp. 1–14.

Henseler, J., C.M. Ringle, and M. Sarstedt. 2015. A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science* 43 (1): 115–135.

Hew, J.J., L.Y. Leong, G.W.H. Tan, K.B. Ooi, and V.H. Lee. 2019. The age of mobile social commerce: An Artificial Neural Network analysis on its resistances. *Technological Forecasting and Social Change* 144: 311–324.

Hsu, C.L., and J.C.C. Lin. 2015. What drives purchase intention for paid mobile apps?—An expectation confirmation model with perceived value. *Electronic Commerce Research and Applications* 14 (1): 46–57.

Hsu, C.L., H.P. Lu, and H.H. Hsu. 2007. Adoption of the mobile Internet: An empirical study of multimedia message service (MMS). *Omega* 35 (6): 715–726.

Islam, T., C. Abid, M. Salman, and Z. Ahmer. 2020. How perceptions about ease of use and risk explain intention to use mobile payment service in Pakistan? The mediating role of perceived trust. *Pakistan Journal of Commerce and Social Sciences (PJCSS)* 14 (1): 34–48.

Jadil, Y., N.P. Rana, and Y.K. Dwivedi. 2022. Understanding the drivers of online trust and intention to buy on a website: An emerging market perspective. *International Journal of Information Management Data Insights* 2 (1): 100065.

Kar, A.K. 2021. What affects usage satisfaction in mobile payments? Modelling user generated content to develop the "digital service usage satisfaction model." *Information Systems Frontiers* 23 (5): 1341–1361.

Kalinić, Z., F. J. Liébana-Cabanillas, F. Muñoz-Leiva, and V. Marinković 2019. The moderating impact of gender on the acceptance of peer-to-peer mobile payment systems. *International Journal of Bank Marketing*.

Kapoor, K.K., Y.K. Dwivedi, and M.D. Williams. 2015. Examining the role of three sets of innovation attributes for determining adoption of the interbank mobile payment service. *Information Systems Frontiers* 17 (5): 1039–1056.

Karjaluoto, H., A. Töllinen, J. Pirttiniemi, and C. Jayawardhena. 2014. Intention to use mobile customer relationship management systems. *Industrial Management & Data Systems*.

Kee, K., and E. Shin. 2022. Algorithm awareness: Why user awareness is critical for personal privacy in the adoption of algorithmic platforms? *International Journal of Information Management* 65: 102494.

Kim, C., M. Mirusmonov, and I. Lee. 2010. An empirical examination of factors influencing the intention to use mobile payment. *Computers in Human Behavior* 26 (3): 310–322.

Kim, S., and G. Garrison. 2009. Investigating mobile wireless technology adoption: An extension of the technology acceptance model. *Information Systems Frontiers* 11 (3): 323–333.

Kleivene, L. E. 2018. P2P Mobile Payments: Investigating the Factors of Adoption among Students in Germany. In *Omnichannel Branding* (pp. 45–67). Springer Gabler, Wiesbaden.

Koenig-Lewis, N., A. Palmer, and A. Moll. 2010. Predicting young consumers' take up of mobile banking services. *International journal of bank marketing*.

Lara-Rubio, J., A. F. Villarejo-Ramos, and F. Liébana-Cabanillas. 2020. Explanatory and predictive model of the adoption of P2P payment systems. *Behaviour and Information Technology*, pp. 1–14.

Lawrence, J.E., and U.A. Tar. 2010. Barriers to e-commerce in developing countries. *Information, Society and Justice Journal* 3 (1): 23–35.

Lean, O.K., S. Zailani, T. Ramayah, and Y. Fernando. 2009. Factors influencing intention to use e-government services among citizens in Malaysia. *International Journal of Information Management* 29 (6): 458–475.

Lee, Y.H., Y.C. Hsieh, and C.N. Hsu. 2011. Adding innovation diffusion theory to the technology acceptance model: Supporting employees' intentions to use e-learning systems. *Journal of Educational Technology & Society* 14 (4): 124–137.

Lew, S., G.W.H. Tan, X.M. Loh, J.J. Hew, and K.B. Ooi. 2020. The disruptive mobile wallet in the hospitality industry: An extended mobile technology acceptance model. *Technology in Society* 63: 101430.

Liébana-Cabanillas, F., A. Japutra, S. Molinillo, N. Singh, and N. Sinha. 2020. Assessment of mobile technology use in the emerging market: Analyzing intention to use m-payment services in India. *Telecommunications Policy* 44 (9): 102009.

Liébana-Cabanillas, F., S. Molinillo, and A. Japutra. 2021. Exploring the determinants of intention to use P2P mobile payment in Spain. *Information Systems Management* 38 (2): 165–180.

Liébana-Cabanillas, F., S. Molinillo, and M. Ruiz-Montañez. 2019. To use or not to use, that is the question: Analysis of the determining factors for using NFC mobile payment systems in public transportation. *Technological Forecasting and Social Change* 139: 266–276.

Liébana-Cabanillas, F., F. Munoz-Leiva, and J. Sánchez-Fernández. 2018. A global approach to the analysis of user behavior in mobile payment systems in the new electronic environment. *Service Business* 12 (1): 25–64.

Liébana-Cabanillas, F., I. Ramos de Luna, and F.J. Montoro-Ríos. 2015. User behaviour in QR mobile payment system: The QR Payment Acceptance Model. *Technology Analysis & Strategic Management* 27 (9): 1031–1049.

Makanyeza, C. 2017. Determinants of consumers' Intention to adopt mobile banking services in Zimbabwe. International Journal of Bank Marketing.

Morawczynski, O., and G. Miscione. 2008. Examining trust in mobile banking transactions: The case of M-PESA in Kenya. In *IFIP International Conference on Human Choice and Computers* (pp. 287–298). Springer, Boston, MA.

Mortimer, G., L. Neale, S. F. E. Hasan, and B. Dunphy. 2015. Investigating the factors influencing the adoption of m-banking: a cross cultural study. *International Journal of Bank Marketing*.

Odumeru, J.A. 2012. Diffusion of online recruiting technology in Nigeria. *Online Journal of Social Sciences Research* 1 (4): 104–114.

Ozturk, A. B., A. Bilgihan, S. Salehi-Esfahani, and N. Hua, 2017. Understanding the mobile payment technology acceptance based on valence theory. *International Journal of Contemporary Hospitality Management*.

Pal, A., T. Herath, R. De,and H. R. Rao. 2018. An investigation of affordances and constraints for continued usage of mobile payment technology. In *Proceedings of the Annual Workshop of the AIS Special Interest Group for ICT in Global Development* (pp. 1–19). San Francisco: Association for Information Systems.

Pal, A., T. Herath, R. De', and H.R. Rao. 2020. Contextual facilitators and barriers influencing the continued use of mobile payment services in a developing country: Insights from adopters in India. *Information Technology for Development* 26 (2): 394–420.

Park, K. 1998. Innovative Product Usage Behavior in the Post-Adoption Process. *ACR Asia-Pacific Advances*.

Pham, T.T.T., and J.C. Ho. 2015. The effects of product-related, personal-related factors and attractiveness of alternatives on consumer adoption of NFC-based mobile payments. *Technology in Society* 43: 159–172.

Raleting, T., and J. Nel. 2011. Determinants of low-income non-users attitude towards WIG mobile phone banking: Evidence from South Africa. *African Journal of Business Management* 5 (1): 212–223.

Ram, S., and J. N. Sheth. 1989. Consumer resistance to innovations: the marketing problem and its solutions. *Journal of consumer marketing*.

Rampton, J. 2016. The evolution of the mobile payment. *TechCrunch. Com. Retrieved*.

Raza, S.A., W. Qazi, and A. Umer. 2017a. Facebook is a source of social capital building among university students: Evidence from a developing country. *Journal of Educational Computing Research* 55 (3): 295–322.

Raza, S.A., A. Umer, W. Qazi, and M. Makhdoom. 2017b. The effects of attitudinal, normative, and control beliefs on M-learning adoption among the students of higher education in Pakistan. *Journal of Educational Computing Research* 56 (4): 0735633117715941.

Raza, S. A., N. Shah, and M. Ali. 2018. Acceptance of mobile banking in Islamic banks: evidence from modified UTAUT model. Journal of Islamic marketing.

Rehman, M., and V. Esichaikul. 2011. Factors influencing the adoption of e-government in Pakistan. In *2011 International Conference on E-Business and E-Government (ICEE)* (pp. 1–4). IEEE.

Rezaei-Moghaddam, K., and S. Salehi. 2010. Agricultural specialists' intention toward precision agriculture technologies: Integrating innovation characteristics to technology acceptance model. *African Journal of Agricultural Research* 5 (11): 1191–1199.

Ringle, C. M. (2005). SmartPLS 2.0 (M3). http://www.smartpls. De.

Ringle, C.M. S. Wende, and J. M. Becker. 2014. Smartpls 3, Hamburg: SmartPLS. Available at: /www.smartpls.com

Rogers, E. M. 1995. Diffusion of Innovations: modifications of a model for telecommunications. In *Die diffusion von innovationen in der telekommunikation* (pp. 25–38). Springer, Berlin, Heidelberg.

Rouvinen, P. 2006. Diffusion of digital mobile telephony: Are developing countries different? *Telecommunications Policy* 30 (1): 46–63.

Rui, H., G. W. H. Tan, E. C. X. Aw, T. H. Cham, and K. B. Ooi. 2022. What is Stopping You from Using Mobile Payment? A PLS-SEM Approach. In International Conference on Human-Computer Interaction (pp. 208–220). Springer, Cham.

Sampat, B. 2016. Antecedents to Mobile Banking Adoption in India: An Extended TAM model. *Wealth: International Journal of Money, Banking & Finance*, *5*(2).

Schierz, P.G., O. Schilke, and B.W. Wirtz. 2010. Understanding consumer acceptance of mobile payment services: An empirical analysis. *Electronic Commerce Research and Applications* 9 (3): 209–216.

Shang, D., and W. Wu. 2017. Understanding mobile shopping consumers' continuance intention. *Industrial Management & Data Systems*.

Shin, D.H. 2009. Towards an understanding of the consumer acceptance of mobile wallet. *Computers in Human Behavior* 25 (6): 1343–1354.

Shin, D.H. 2010. The effects of trust, security and privacy in social networking: A security-based approach to understand the pattern of adoption. *Interacting with Computers* 22 (5): 428–438.

Singh, N., N. Sinha, and F.J. Liébana-Cabanillas. 2020. Determining factors in the adoption and recommendation of mobile wallet services in India: Analysis of the effect of innovativeness, stress to use and social influence. *International Journal of Information Management* 50: 191–205.

Swilley, E. 2010. Technology rejection: the case of the wallet phone. *Journal of Consumer Marketing*.

Tew, H.T., G.W.H. Tan, X.M. Loh, V.H. Lee, W.L. Lim, and K.B. Ooi. 2022. Tapping the next purchase: Embracing the wave of mobile payment. *Journal of Computer Information Systems* 62 (3): 527–535.

Venkatesh, V., M. G. Morris, G. B. Davis, and F. D. Davis. 2003. User acceptance of information technology: Toward a unified view. *MIS quarterly*, 425–478.

Venkatesh, V., J. Y. Thong, and X. Xu. 2012. Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. *MIS quarterly*, pp. 157–178.

Yang, S., Y. Lu, S. Gupta, Y. Cao, and R. Zhang. 2012. Mobile payment services adoption across time: An empirical study of the effects of behavioral beliefs, social influences, and personal traits. *Computers in Human Behavior* 28 (1): 129–142.

Yuan, S., L. Liu, B. Su, and H. Zhang. 2020. Determining the antecedents of mobile payment loyalty: Cognitive and affective perspectives. *Electronic Commerce Research and Applications* 41: 100971.

Zhou, T. 2013. An empirical examination of continuance intention of mobile payment services. *Decision Support Systems* 54 (2): 1085–1091.

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