

An empirical examination of factors affecting the post-adoption stage of mobile wallets by consumers: A perspective from a developing country

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ABSTRACT

Although the critical success factors might be different between the pre and post-adoption stages of mobile wallets, there have been few studies conducted to examine those factors for the post-adoption stage when compared to the number of studies conducted to examine those factors for the pre-adoption stage. Yet, the post-adoption stage of mobile wallets is crucial to the success and sustainability of the mobile wallets' ecosystem. Thus, this study developed and examined a model by integrating relevant factors into the Technology Acceptance Model 2 (TAM2). Data were collected from 578 mobile wallet users in Jordan using an electronic questionnaire. A structural equation modelling approach was utilized to analyze the data. The results revealed that perceived usefulness and perceived ease of use have statistically significant positive direct effects on the intention to continuous use of mobile wallets, while subjective norm does not. In addition to that, results indicated that trust, security, and ubiquity have statistically significant positive direct effects on perceived usefulness and perceived ease of use, and, in turn, on the intention to continuous use of mobile wallets. Moreover, this study found that perceived ease of use and subjective norms have statistically significant positive direct effects on perceived usefulness, and, in turn, on the intention of continuous use of mobile wallets. While risk does not have a significant effect on perceived usefulness, it has been found to have a statistically significant negative direct effect on perceived ease of use, and, in turn, on the intention to continuous use of mobile wallets. The findings of this study should help stakeholders to develop more effective consumer retention tactics and formulate appropriate marketing decisions.

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1. Introduction

Rapid developments in Information and Communications Technology (ICT) have been revolutionizing financial technologies. The evolution of smart technologies has resulted in a plethora of ICT tools and applications which can ignite competition to innovate in fintech (Jocovski et al., 2020). Each radical or continuous innovation in ICT leads to a transformation of the way financial transactions are conducted (Hsiao, 2019). Characterized by their intelligent computational power, the ability to interact with users and the surrounding environment, and the connectivity ability to the internet or other devices, smart technology devices along with their smart applications have promoted the development of mobile payment services (Silverio-Fernández et al., 2018; Yan et al., 2021). Mobile payment is defined as any money-related transaction in which a mobile-smart technology device is used to wirelessly initiate and perform this transaction (Iman, 2018). Mobile wallets belong to a wider family of mobile payment services (Téllez & Zeadally, 2017). A mobile wallet “is a much-advanced versatile application that includes elements of mobile transactions, as well as other items one may find in a wallet, such as membership cards, loyalty cards, and travel cards. It also stores personal and sensitive information like passports, credit card information, PIN codes, online shopping accounts, booking details, and insurance

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policies that can be encrypted or password-protected” (D.-H. Shin, 2009, p. 1343). The features of a mobile wallet vary from one country to the other and from one service provider to the other. Typically, consumers, in Jordan, can use mobile wallets to make cash deposits and withdrawals, send and receive money, pay bills, and purchase goods and services. Jordan has eight service providers for mobile wallets including Orange Money, Zain Cash, Dinarak, Aya JO, Gadha, National Wallet, and Mahfazati (Central Bank of Jordan, 2020).

In Jordan, during the second quarter of 2020, the number of mobile wallet consumers has increased dramatically because the government mandated that people who are entitled to government support must open mobile wallets, to receive their support payments by direct deposit to their mobile wallet accounts. The reason behind that is to promote cashless transactions to help people conduct some of their financial transactions remotely as a measure to prevent COVID-19 spread. Other people who are inclined to use mobile wallets, in Jordan, are those who do not have bank accounts or those whose banks offer limited financial services (Central Bank of Jordan, 2020). The widespread use of mobile wallets is mainly due to the relatively affordable prices of smart technology devices and mobile telecommunication subscriptions (Dahlberg et al., 2015; Madan & Yadav, 2016). Worldwide, 4.66 billion people, 59.5% of the world population, were active internet users as of January 2021, with 4.32 billion internet users, 92.6% of the total, accessed the internet via mobile devices (Statista). Jordan, as a developing country, in the last decade, achieved outstanding developments in the ICT sector. According to a recent report, in Jordan, there were 8,700,000 active internet users as of March 2021 (Internet World Stats). The critical success factors of the pre-adoption and post-adoption stages of mobile wallets depend on the interplay among many stakeholders including consumers, merchants, financial institutions, and mobile service providers (Dahlberg et al., 2008; Dahlberg et al., 2015). Financial enterprises and telecommunication companies have always been in the race to invest in technology-oriented innovations, including mobile wallets, to maximize their profit (D.-H. Shin, 2009; Iman, 2018; Kumar et al., 2019). Nonetheless, the success of a mobile wallet ecosystem relies on the other players in the cycle, namely, consumers and merchants. Although consumers might be enticed by the advantages that mobile wallets have to offer over traditional payment methods (Rathore, 2016; Boden et al., 2020), financial enterprises, mobile service providers, and merchants need to rely on an integrated and cohesive perspective of what attracts consumers to remain in continuous use of mobile wallets (Au & Kauffman, 2008; Albuquerque et al., 2016).

The post-adoption stage is crucial for the success and sustainability of the mobile wallets’ ecosystem. Nonetheless, an extensive review of related literature on the pre-adoption and post-adoption stages of mobile wallets by consumers revealed that there is a dearth of research conducted to examine the critical success factors of the post-adoption stage of mobile from consumers’ perspectives compared to research conducted to examine the critical success factors of the pre-adoption stage. Meanwhile, the critical predictors of the intention to continuance use of mobile wallets by consumers might be different from those which are critical to the intention to adopt wallets (Karahanna et al., 1999; Chang & Zhu, 2011; Caron-Fasan et al., 2020; Sharma et al., 2021). Moreover, the few studies which were conducted to examine the critical factors to the intention to continuance use of mobile wallets by consumers were limited in scope, namely, they examined a limited number of factors. In addition to that, most of the studies that are concerned with the post-adoption stage adopted the DeLone and McLean model of information systems success, which lacks the theoretical foundation to predict behavioral intention (Chen & Cheng, 2009; Mardiana et al., 2015), and the information technology continuance model, which neglects the social influence on behavioral intention of consumers (Fishbein & Ajzen, 1975; M.-C. Lee, 2010). Therefore, this study aims to explore several factors that may, directly and indirectly, affect the intention to continuance use of mobile wallets by consumers through the lens of TAM, which is better at predicting the behavioral intention of consumers because it is based on the Theory of Reasoned Action (Fishbein & Ajzen, 1975). The findings of this study are expected to provide mobile wallet service providers, financial institutions, and merchants with practical guidance for developing marketing and competition strategies.

2. Literature review

The literature review is divided into two main sections including studies related to (1) the pre-adoption stage and (2) the post-adoption stages of mobile wallets by consumers. Because this study is adopting TAM, the selection of studies that relate to the pre-adoption stage was limited to those that adopted TAM. However, the selection of studies that relate to the post-adoption stage was expanded beyond those that adopted TAM due to the dearth of studies that adopted TAM. The first section of the literature review is organized around the factors which are believed to be important to be examined in the context of the post-adoption stage. The second section is presented in a study-by-study fashion. Fig. 1 depicts the research model developed.

2.1 Studies related to the pre-adoption stage of mobile wallets by consumers

2.1.1. Perceived usefulness, perceived ease of use, subjective norm, and behavioral intention

Perceived usefulness is the degree of practical worth or applicability, as perceived by users, of a particular information system to accomplish certain tasks. On the other hand, perceived ease of use is the extent to which users perceive an information system as easy to use while completing their tasks (Davis, 1989). Subjective norm is the degree to which peers

of persons influence their decision toward continuous use of an information system. The intention to continuance use of a particular information system is a measure of a person's determination to continue using the system (Fishbein & Ajzen, 1975). TAM2 theorizes that perceived ease of use and perceived usefulness of an information system are critical antecedents of the intention to continuance use of the system. Also, the perceived ease of use of an information system is a critical predictor of its perceived usefulness. Moreover, subjective norm is a critical antecedent of the perceived usefulness of an information system and a person's decision to continue using the system (Fishbein & Ajzen, 1975; Davis et al., 1989; Venkatesh & Davis, 2000). Previous studies found that perceived usefulness has a statistically significant positive direct effect on the intention to adopt mobile wallets by consumers (H. Amin, 2009; N. Shaw, 2014; S. Shin & Lee, 2014; M. K. Amin et al., 2015; Kafsh, 2015; N. Shaw, 2015; Patel, 2016; Seetharaman et al., 2017; Yadav, 2017; Al-Amri et al., 2018; Chakraborty & Mitra, 2018; Chawla & Joshi, 2019; Eappen, 2019; Isrososiawan et al., 2019; Mahwadha, 2019; B. Shaw & Kesharwani, 2019; Chan et al., 2020; Chawla & Joshi, 2020b, 2020a; Deka, 2020; Jin et al., 2020; Karim et al., 2020; Singh et al., 2020; Alwi et al., 2021; Tripathi et al., 2021), and only one study did not find an effect (Campbell, 2017). Therefore, we propose the following hypothesis:

Hypothesis 1 (H1): *Perceived usefulness of mobile wallets has a statistically significant positive direct effect on the intention to continuance use of mobile wallets.*

While many studies revealed that perceived ease of use has a statistically significant positive direct effect on the intention to adopt mobile wallets by consumers (H. Amin, 2009; Kafsh, 2015; N. Shaw, 2015; Campbell, 2017; Al-Amri et al., 2018; Chakraborty & Mitra, 2018; Chatterjee & Bolar, 2019; Eappen, 2019; Isrososiawan et al., 2019; Reddy & Rao, 2019; Chawla & Joshi, 2020b; Karim et al., 2020; Singh et al., 2020; Alwi et al., 2021), other studies did not find an effect (N. Shaw, 2014; S. Shin & Lee, 2014; M. K. Amin et al., 2015; Patel, 2016; Seetharaman et al., 2017; Yadav, 2017; B. Shaw & Kesharwani, 2019; Chan et al., 2020; Deka, 2020).

Concerning the relationship between perceived ease of use and perceived usefulness of mobile wallets, some studies revealed that perceived ease of use is a statistically significant positive predictor of perceived usefulness (H. Amin, 2009; Swilley, 2010; S. Shin & Lee, 2014; Kafsh, 2015; Aydin & Burnaz, 2016; Campbell, 2017; Seetharaman et al., 2017; Chawla & Joshi, 2019; Eappen, 2019; B. Shaw & Kesharwani, 2019; Chawla & Joshi, 2020b, 2020a; Jin et al., 2020; Karim et al., 2020). On the other hand, two other studies did not find a significant relationship between them (Patel, 2016; Deka, 2020). Therefore, we propose the following hypotheses:

Hypothesis 2 (H2): *Perceived ease of use of mobile wallets has a statistically significant positive direct effect on the intention to continuance use of mobile wallets.*

Hypothesis 3 (H3): *Perceived ease of use of mobile wallets has a statistically significant positive direct effect on perceived usefulness of mobile wallets.*

Whereas several studies found that the subjective norm has a statistically significant positive direct effect on the intention to adopt mobile wallets by consumers (Aydin & Burnaz, 2016; Madan & Yadav, 2016; Chakraborty & Mitra, 2018; B. Shaw & Kesharwani, 2019; Deka, 2020; Jin et al., 2020; Alwi et al., 2021), other studies did not find an effect (D.-H. Shin, 2009; Kafsh, 2015; Patel, 2016). In addition to that, some studies found that the subjective norm has a statistically significant positive direct effect on perceived ease of use (Kafsh, 2015), and perceived usefulness of mobile wallets (Mei & Aun, 2019). Therefore, we propose the following hypotheses:

Hypothesis 4 (H4): *Subjective norm has a statistically significant positive direct effect on the intention to continuance use of mobile wallets.*

Hypothesis 5 (H5): *Subjective norm has a statistically significant positive direct effect on perceived usefulness of mobile wallets.*

2.1.2. External factors, perceived ease of use, and perceived usefulness

TAM2 theorizes that external factors directly impact the perceived usefulness and perceived ease of use of an information system. However, those external factors affect the intention to continuance use of an information system indirectly via perceived usefulness and perceived ease of use (Venkatesh & Davis, 2000). An extensive review of related literature on mobile payments' and mobile wallets' adoption and acceptance revealed that there are four factors of importance to be examined in the context of this study, including perceived risk, perceived security, perceived trust, and ubiquity (Teng & Khong, 2021). The aforementioned factors are among the most examined and critical determinants of mobile payments' and mobile wallets' adoption and acceptance, by consumers (Dahlberg et al., 2015). Previous studies examined the relationships among these factors and their effect on the intention to adopt mobile wallets in several ways. However, the current study examines the effect of the identified factors on the perceived usefulness and perceived ease of use of mobile wallets, and, in turn, on the intention to continuance use of mobile wallets as theorized by TAM2.

Perceived risk is usually linked to the fear of losing money due to malfunctions by mobile wallet systems or unauthorized transactions which might occur (Featherman & Pavlou, 2003). Mobile payment services acceptance by consumers is associated with perceived risk (T. Zhou, 2014; Leong et al., 2020) because consumers are sensitive to financial-related transactions (Featherman & Pavlou, 2003; Kleijnen et al., 2007). Perceived risk is an extremely critical factor of the intention to adopt mobile payment services (Thakur & Srivastava, 2014; Yang et al., 2015; de Kerviler et al., 2016; Karsen et al., 2019; Liu et al., 2019). Previous studies found that perceived risk negatively impacts the perceived usefulness of mobile payment services (Hampshire, 2017), and the intention to adopt them by consumers (Hongxia et al., 2011; J. Wu et al., 2017; Humbani & Wiese, 2018). Thus, the perceived risk associated with the use of mobile wallets should be low for consumers to realize their perceived ease of use and perceived usefulness, and, in turn, remain in continuous use of them. Therefore, we propose the following hypotheses:

Hypothesis 6 (H6): *Perceived risk of mobile wallets has a statistically significant negative direct effect on perceived usefulness of mobile wallets.*

Hypothesis 7 (H7): *Perceived risk of mobile wallets has a statistically significant negative direct effect on perceived ease of use of mobile wallets.*

Perceived security is the degree to which consumers perceive mobile wallets as secure and safe to conduct their financial transactions (Chellappa & Pavlou, 2002; D. H. Shin, 2008). Perceived security is almost the most challenging factor affecting consumers' acceptance of mobile payment services because it is associated with their financial and personal information (D.-H. Shin, 2009; Oliveira et al., 2016; Rathore, 2016; Kang, 2018; Karsen et al., 2019; George & Sunny, 2021). If customers feel insecure using an information system, they tend to reject it (Cheong et al., 2004; Laforet & Li, 2005; A. Shankar & Behl, 2021). Previous studies found that perceived security has a statistically significant positive effect on perceived ease of use (S. Shin & Lee, 2014; N. Shaw, 2015; Patel, 2016; Seetharaman et al., 2017), and perceived usefulness (N. Shaw, 2015) of mobile wallets. Therefore, it can be argued that if mobile wallets are perceived as secure, consumers find them easy to use and useful, and, in turn, they are willing to remain in continuous use of them. Therefore, we propose the following hypotheses:

Hypothesis 8 (H8): *Perceived security of mobile wallets has a statistically significant positive direct effect on perceived usefulness of mobile wallets.*

Hypothesis 9 (H9): *Perceived security of mobile wallets has a statistically significant positive direct effect on perceived ease of use of mobile wallets.*

Perceived trust is how reliable and trustworthy consumers find mobile wallets in conducting financial transactions (Gefen et al., 2003). Mobile payment services must be trusted by consumers to accept and use them (T. Zhou, 2014; George & Sunny, 2021). Perceived trust is believed to be an important antecedent of the intention to adopt mobile payment services (Lu et al., 2011; Karsen et al., 2019; Liu et al., 2019; Donald et al., 2021; Tripathi et al., 2021) as it reduces the fear and anxiety associated with the use of mobile wallets (Chandra et al., 2010; Xin et al., 2013). Prior research has found that perceived trust has a statistically significant positive effect on the perceived usefulness of mobile wallets (Eappen, 2019; Mahwadha, 2019). Moreover, previous studies found that perceived trust positively impacts the perceived usefulness of mobile payment services (Hampshire, 2017), and the intention to adopt (Lu et al., 2011) and continuance use of them (Shao et al., 2019). Therefore, it can be argued that if mobile wallets are perceived as trustworthy, consumers find them easy to use and useful, and, in turn, they are willing to remain in continuous use of them. Therefore, we propose the following hypotheses:

Hypothesis 10 (H10): *Perceived trust of mobile wallets has a statistically significant positive direct effect on perceived usefulness of mobile wallets.*

Hypothesis 11 (H11): *Perceived trust of mobile wallets has a statistically significant positive direct effect on perceived ease of use of mobile wallets.*

Ubiquity is the prevalence of mobile wallet services whenever and wherever consumers need to conduct financial transactions (Balasubraman et al., 2002; Kleijnen et al., 2007; Shen et al., 2020). That is, consumers should be able to conduct their financial transactions without spending a long time (V. Shankar et al., 2003; Anwar et al., 2020), and without spatial and temporal constraints (Ghose et al., 2013). Ubiquity gives mobile payment services a distinguished advantage over other payment methods (Alhallaq et al., 2019). Hence, ubiquity is believed to be an important antecedent factor of the intention to adopt mobile payment services due to the promised convenience offered to consumers (Clarke, 2008; C. Kim et al., 2009; Kim et al., 2010; Tao Zhou, 2011; T. Zhou, 2014). Therefore, it can be argued that if mobile wallets are ubiquitous, consumers perceive them as easy to use and useful, and, in turn, they are inclined to continue using them. Therefore, we propose the following hypotheses:

Hypothesis 12 (H12): *Ubiquity of mobile wallets has a statistically significant positive direct effect on perceived usefulness of mobile wallets.*

Hypothesis 13 (H13): Ubiquity of mobile wallets has a statistically significant positive direct effect on perceived ease of use of mobile wallets.

2.2 Studies related to the post-adoption stage of mobile wallets by consumers

A study conducted by Azizah et al. (2018) extended the DeLone and McLean model of information systems success to examine the factors affecting consumers' intention to continuance use of mobile wallets in Indonesia. The study revealed that trust and flow have statistically significant positive direct effects on the intention to continuance use of mobile wallets by consumers whereas satisfaction has a statistically significant negative direct effect. Moreover, it was found that while trust and flow have statistically significant positive direct effects on consumers' satisfaction with mobile wallets, system quality, service quality, and information quality do not. In addition to that, trust and system quality were found to have statistically significant positive direct effects on flow whereas service quality and information quality do not. Finally, system quality, service quality, and information quality were found to have statistically significant positive direct effects on trust.

Using an extended DeLone and McLean model of information systems success, Routray et al. (2019) conducted a study to investigate the antecedents of the intention to continuance use of mobile wallets by consumers in India. The study revealed that whereas information quality has a statistically significant positive direct effect on perceived usefulness, system quality, service quality, and security do not. Moreover, it was found that system quality and service quality have statistically significant positive direct effects on perceived security. Finally, perceived usefulness and perceived security were found to have statistically significant positive direct effects on the intention to continuance use of mobile wallets.

Mombeuil (2020) conducted a study to explore the determinants of the intention to continuance use of mobile wallets by African students who study in China. The results of the study revealed that relative convenience, relative advantage, perceived privacy, and perceived security have statistically significant positive direct effects on the intention to continuance use of mobile wallets.

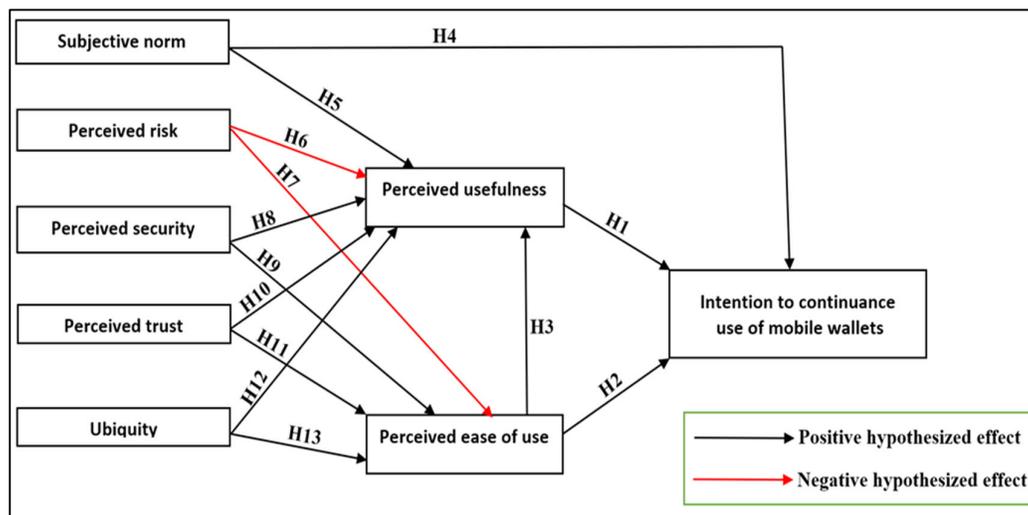


Fig. 1. Research model

A study conducted by Talwar et al. (2020) adopted the DeLone and McLean model of information systems success, transaction cost economics theory, and the information technology continuance model empirically examined a two-step framework to explore the critical success factors of the pre-adoption and post-adoption stages of mobile wallets by students in India. For the pre-adoption stage, the results of the study revealed that perceived information quality, perceived service quality, and perceived asset specificity have statistically significant positive direct effects on initial trust whereas perceived uncertainty does not. Moreover, the results revealed that initial trust within the pre-adoption stage has statistically significant positive direct effects on perceived usefulness and confirmation within the post-adoption stage whereas it does not influence dissatisfaction. For the post-adoption stage, the results of the study revealed that perceived usefulness has a statistically significant positive direct effect on the intention to continuance use of mobile wallets whereas dissatisfaction does not. Moreover, it was found that while confirmation has a statistically significant positive direct effect on perceived usefulness, it does not have a statistically significant effect on dissatisfaction. Finally, the study found that perceived usefulness does not have a statistically significant effect on dissatisfaction.

Using an extended TAM, Garrouch (2021) conducted a study to investigate the antecedents of the intention to continuance use of mobile wallets by consumers in Saudi Arabia. The study revealed that whereas value, trust, security, and usefulness

of mobile wallets have statistically significant positive direct effects on the intention to continuance use of mobile wallets, ease of use does not. Moreover, it was found that usefulness, reputation, and ease of use have statistically significant positive direct effects on trust.

3. Rationale of the study

The post-adoption stage is crucial for the success and sustainability of the mobile wallets' ecosystem. However, there has been a plethora of research conducted to investigate the intention to adopt mobile wallets by consumers (H. Amin, 2009; D.-H. Shin, 2009; Swilley, 2010; N. Shaw, 2014; M. K. Amin et al., 2015; N. Shaw, 2015; Aydin & Burnaz, 2016; Madan & Yadav, 2016; Patel, 2016; Rathore, 2016; Campbell, 2017; Dixit et al., 2017; Seetharaman et al., 2017; Yadav, 2017; Al-Amri et al., 2018; Alaeddin et al., 2018; Chatterjee & Bolar, 2019; Chawla & Joshi, 2019; Mahwadha, 2019; B. Shaw & Kesharwani, 2019; Chan et al., 2020; Chawla & Joshi, 2020b, 2020a; Deka, 2020; Jin et al., 2020; Karim et al., 2020; Singh et al., 2020; Soodan & Rana, 2020), there is a dearth carried out to examine the intention to continuance use (Azizah et al., 2018; Routray et al., 2019; Mombeuil, 2020; Talwar et al., 2020; Garrouch, 2021). However, it has been evident that critical success factors of information systems might be different between the pre-adoption and the post-adoption stages of mobile wallets (Karahanna et al., 1999; Chang & Zhu, 2011; Caron-Fasan et al., 2020; Sharma et al., 2021).

Moreover, the few studies which were conducted to examine the critical factors to the intention to continuance use of mobile wallets by consumers were limited in scope, namely, they examined a limited number of factors. In addition to that, most of the studies that are concerned with the post-adoption stage adopted the DeLone and McLean model of information systems success and the information technology continuance model. The former lacks the theoretical foundation to predict behavioral intention (Chen & Cheng, 2009; Mardiana et al., 2015), and the latter neglects the social influence on behavioral intention of consumers (Fishbein & Ajzen, 1975; M.-C. Lee, 2010). Even the study which was conducted using TAM, by Garrouch, (2021), it explored only the direct effect of certain factors on the intention to continuance use of mobile wallets, and neglected the indirect effect of these factors through perceived ease of use and perceived usefulness as theorized by TAM. In addition to that, the study by Garrouch, (2021) neglected the direct and indirect effect of subjective norm on the intention to continuance use of mobile wallets and used a relatively small sample size.

Therefore, this study aims to explore more factors that may, directly and indirectly, affect the intention to continuance use of mobile wallets by consumers through the lens of TAM, which is better at predicting the behavioral intention of consumers because it is based on the Theory of Reasoned Action (Davis 1989). TAM is considered to be very robust (King & He, 2006; Yousafzai et al., 2007; K. Wu et al., 2011) in examining continuation of technology use at the individual level, as it explains up to 60% of the variance in perceived usefulness, and up to 52% of the variance in the behavioral intention of end-users (Venkatesh & Davis, 2000). Equally importantly, TAM has been the most adopted model for studying the drivers of the behavioral intention of end-users toward novel technologies (Y. Lee et al., 2003; Ma & Liu, 2004; Marangunic & Granic, 2015; Lai, 2017; Taherdoost, 2018), as it is the case of mobile wallets in Jordan.

Furthermore, most of the studies which examined factors influencing the pre and post-adoption stages of mobile wallets were conducted in emerging and developed economies while there have been very few studies conducted in developing countries. In addition to that, culture impacts the behavioral intention of consumers toward any technology (S.-G. Lee et al., 2013; Dutot et al., 2019), and the vast majority of previous studies related to the pre and post-adoption stages of mobile wallets were conducted in countries that have different cultures from Jordan.

Therefore, this study aims to fill in the identified research gap by examining factors influencing the intention to continuance use of mobile wallets, in Jordan, as being a developing country, rather than the intention to adopt. The results are expected to contribute to the literature on the post-adoption stage of mobile wallets. Also, the findings of this study are expected to better inform mobile wallet service providers, financial institutions, and merchants to develop more effective consumer retention tactics and formulate appropriate marketing decisions.

4. Research methodology

This is an exploratory quantitative study. The target population for this study is all mobile wallet consumers in Jordan. The sample for this study was acquired through an internet sampling approach. Internet surveys allow access to a hard-to-reach population and are considered to be fast, and cost-effective (Malhotra, 2012; Dusek et al., 2015).

Therefore, an electronic questionnaire was developed and put out to seek responses from current mobile wallet users in Jordan. The electronic questionnaire was hosted on a Google form, and it was made available on the Web from May 1, 2021 to June 1, 2021. The invitation to fill in the questionnaire was distributed via social network applications. Since the language of all prospective respondents is Arabic, the questionnaire was translated into their native Arabic language.

On the first page of the electronic questionnaire, the objectives of the research were presented, stating clearly that participation was voluntary, and the answers would be kept confidential. To ensure that all respondents were current users

of mobile wallets, a filter question was added to the questionnaire. The filter question prevented people who are not current users of mobile wallets from completing the questionnaire.

The questionnaire consisted of two parts; the first part sought demographic information about the respondents, and the second part included the operationalization of constructs. All constructs were operationalized using validated items from prior research while they were tailored to the purpose of this study. All the constructs were operationalized using a 5-point Likert scale from 1 (“strongly disagree”) to 5 (“strongly agree”). All Likert scale items were judged by a panel of three experts in the field of mobile payment services. Table 1 presents the constructs, their associated number of items, and the resources they were obtained from. A total of 578 valid responses were obtained. Structural equation modelling approach, in R language version 4.0.1, was applied to analyze the data in this study.

Table 1

Measurement constructs

Construct	Number of Items	Resource
Perceived ease of use	4	(Davis et al., 1989)
Perceived usefulness	4	(Davis et al., 1989)
Subjective norm	2	(Taylor & Todd, 1995)
Intention to continuance use	2	(Davis et al., 1989)
Perceived risk	3	(Featherman & Pavlou, 2003)
Perceived security	5	(Cheung & Lee, 2001)
Perceived trust	3	(G. Kim et al., 2009)
Ubiquity	4	(T. Lee, 2005)

5. Results

5.1 Discriminant and convergent validity of the measurement model

The discriminant validity of the measurement model was assessed by the heterotrait-monotrait (HTMT) ratio of correlations. The criterion in this approach is that the HTMT for each pair of constructs should be below 0.85 (Henseler et al., 2015; Voorhees et al., 2016). As presented in Table 2, HTMT for each pair of constructs is below 0.85. As such, the discriminant validity of the measurement model has been established.

The convergent validity of the measurement model was assessed by three criteria: standardized Factor Loading (FL) which must be greater than 0.5 for each item, the composite reliability (CR) which must be above 0.7 for each construct, and the average variance extracted (AVE) which must be larger than 0.5 for each construct (Hair et al., 2009). As presented in Table 3, all constructs met the CR and AVE thresholds. Meanwhile, all measure items met the FL criterion. Therefore, the convergent validity of the measurement model has been established.

Table 2

HTMT results

Construct	PEOU	PU	SN	ITCU	PT	Ubiquity	PS	PR
PEOU	1.000							
PU	0.730	1.000						
SN	0.532	0.708	1.000					
ITCU	0.621	0.835	0.641	1.000				
PT	0.623	0.692	0.594	0.782	1.000			
Ubiquity	0.504	0.635	0.624	0.619	0.568	1.000		
PS	0.722	0.759	0.656	0.816	0.843	0.607	1.000	
PR	0.405	0.314	0.204	0.347	0.323	0.062	0.342	1.000

Note. PEOU: Perceived ease of use, PU: Perceived usefulness, SN: Subjective norm, ITCU: Intention to continuance use, PT: Perceived trust, PS: Perceived security, PR: Perceived risk.

5.2 Goodness-of-fit of the structural model

The goodness-of-fit of the structural model was assessed based on five criteria: Comparative Fit Index (CFI) (Bentler, 1990), Tucker-Lewis Index (TLI) (Bentler & Bonett, 1980), Relative Non-Centrality Index (RNI) (Bentler & Bonett, 1980), Root Mean Square Error of Approximation (RMSEA) (Browne & Cudeck, 1992), and Standardized Root Mean Square Residual (SRMR) (Hu & Bentler, 1999). The structural model met the threshold of all criteria as shown in Table 4.

Table 3

Assessment of the measurement model

Construct	FL	CR	AVE
Perceived ease of use		0.90	0.69
1. Learning to operate a mobile wallet would be easy for me	0.81		
2. I would find it easy to get a mobile wallet to do what I want it to do	0.81		
3. It would be easy for me to become skillful at using a mobile wallet	0.81		
4. I would find a mobile wallet easy to use	0.88		
Perceived usefulness		0.94	0.80
1. Using a mobile wallet would improve the way I conduct my financial transactions	0.86		
2. Using a mobile wallet to conduct my financial transactions would increase my convenience and flexibility	0.90		
3. Using a mobile wallet would make it more effective for me to conduct my financial transactions	0.92		
4. I would find a mobile wallet useful in conducting my financial transactions	0.89		
Subjective norm		0.88	0.79
1. People who influence my behaviour would think that I should use a mobile wallet for conducting financial transactions	0.86		
2. People who are important to me would think that I should use a mobile wallet for conducting financial transactions	0.91		
Intention to continuance use		0.77	0.63
1. Assuming I had access to a mobile wallet, I intend to continue using it	0.89		
2. Given that I had access to a mobile wallet, I predict that I would continue using it	0.68		
Perceived trust		0.90	0.77
1. A mobile wallet always provides accurate financial services	0.79		
2. A mobile wallet always provides reliable financial services	0.92		
3. A mobile wallet always provides safe financial services	0.90		
Ubiquity		0.91	0.71
1. When using a mobile wallet, I can conduct mobile payments at any time	0.86		
2. When using a mobile wallet, I can conduct mobile payments from anywhere	0.88		
3. When using a mobile wallet, I can conduct mobile payments with online or in-store merchants	0.85		
4. When using a mobile wallet, mobile payment services are readily available where I shop	0.79		
Perceived security		0.91	0.68
1. A mobile wallet is reliable to conduct financial transactions	0.65		
2. The service provider takes security measures to protect my payments	0.89		
3. The service provider has the ability to verify user's identity to ensure payment security	0.94		
4. The service provider can ensure the security of payment information	0.89		
5. I feel secure about the transactions performed using mobile wallet services	0.88		
Perceived risk		0.84	0.64
1. I am worried about other people gaining access to my account if I use mobile wallet payment services	0.75		
2. I would not feel secure sending sensitive financial information across mobile wallet services	0.87		
3. Using mobile wallet payment services would involve more financial risk when compared to traditional ways of conducting my financial transactions	0.78		

5.3 Descriptive statistics

As presented in Table 5, the sample consisted of 350 (60.6%) males and 228 (39.4%) females. Participants were aged 24 to 69 years old, with a mean age of 41.2 (SD = 8.63).

Table 4

Goodness-of-fit of the structural model

Fit indices	Value	Criteria
CFI	0.943	> 0.9
TLI	0.933	> 0.9
RNI	0.943	> 0.9
RMSEA	0.068	< .08
SRMR	0.048	< .08

Table 5

Demographic data of the respondents

Criterion	Factor	Frequency	Percentage
Gender	Male	350	60.6%
	Female	228	39.4%
Age	20-29	64	11%
	30-39	170	29.5%
	40-49	261	45.1%
	50-59	60	10.4%
	60-70	23	4%

5.4 Hypotheses testing

The results of the structural equation modelling revealed that perceived usefulness ($z=9.786$, $p=0.000$), and perceived ease of use ($z=7.244$, $p=0.000$) have statistically significant positive direct effects on the intention to continuance use of mobile wallets, while subjective norm does not. Moreover, this study found that perceived ease of use ($z=7.448$, $p=0.000$) and

subjective norm ($z=6.957$, $p=0.000$) have statistically significant positive direct effects on perceived usefulness, and, in turn, on the intention to continuance use of mobile wallets. In addition to that, results indicated that perceived security ($z=2.876$, $p=0.004$), ubiquity ($z=3.398$, $p=0.001$), and perceived trust ($z=2.692$, $p=0.007$) have statistically significant positive direct effects on perceived usefulness, and, in turn, on the intention to continuance use of mobile wallets. Also, perceived security ($z=7.768$, $p=0.000$), ubiquity ($z=3.991$, $p=0.000$), and trust ($z=4.870$, $p=0.000$) have statistically significant positive direct effects on perceived ease of use, and, in turn, on the intention to continuance use of mobile wallets. Finally, while perceived risk does not have a significant effect on perceived usefulness, it has been found to have a statistically significant negative direct effect on perceived ease of use ($z=-4.250$, $p=0.000$), and, in turn, on the intention to continuance use of mobile wallets. Table 6 and Fig. 2 present the results of the structural model statistical analysis and hypothesis testing.

6. Discussion

The intention to continuance use of mobile wallets by consumers is the most critical success factor of the mobile wallets' ecosystem. While most previous studies focused on the pre-adoption phase of mobile wallets, this study examined factors that are critical for the post-adoption stage. That is, the study aimed to better understand the continuance use phenomenon of mobile wallets by Jordanian consumers. Therefore, the present study developed a research framework based on TAM2, and empirically examined several relevant hypotheses to the intention to continuance use of mobile wallets by consumers. Table 7 provides a comparison between the results of this study and the studies which were conducted to examine the critical success factors of the pre-adoption stage of mobile wallets.

Table 6
Assessment of the structural model

Path	Standardized coefficient	z-value	P(> z)	Decision
H1: PU → ITCU	0.630	9.786	0.000 ***	Significant
H2: PEOU → ITCU	0.618	7.244	0.000 ***	Significant
H3: PEOU → PU	0.323	7.448	0.000 ***	Significant
H4: SN → ITCU	-0.091	-1.749	0.080	Insignificant
H5: SN → PU	0.301	6.957	0.000 ***	Significant
H6: PR → PU	-0.023	-0.678	0.498	Insignificant
H7: PR → PEOU	-0.140	-4.250	0.000 ***	Significant
H8: PS → PU	0.133	2.876	0.004 *	Significant
H9: PS → PEOU	0.360	7.768	0.000 ***	Significant
H10: PT → PU	0.102	2.692	0.007 *	Significant
H11: PT → PEOU	0.180	4.870	0.000 ***	Significant
H12: Ubiquity → PU	0.134	3.398	0.001 **	Significant
H13: Ubiquity → PEOU	0.141	3.991	0.000 ***	Significant

Note. Significance codes: 0.000 *** 0.001 ** 0.01*. PEOU: Perceived ease of use, PU: Perceived usefulness, SN: Subjective norm, ITCU: Intention to continuance use, PT: Perceived trust, PS: Perceived security, PR: Perceived risk.

Findings revealed that perceived usefulness has a statistically significant positive direct effect on the intention to continuance use of mobile wallets by consumers. This result is consistent with the findings of previous studies which examined the intention to adopt mobile wallets by consumers (H. Amin, 2009; N. Shaw, 2014; S. Shin & Lee, 2014; M. K. Amin et al., 2015; Kafsh, 2015; N. Shaw, 2015; Patel, 2016; Seetharaman et al., 2017; Yadav, 2017; Al-Amri et al., 2018; Chakraborty & Mitra, 2018; Chatterjee & Bolar, 2019; Chawla & Joshi, 2019; Eappen, 2019; Isrososiawan et al., 2019; Mahwadha, 2019; B. Shaw & Kesharwani, 2019; Chan et al., 2020; Chawla & Joshi, 2020a, 2020b; Deka, 2020; Jin et al., 2020; Karim et al., 2020; Singh et al., 2020). Also, this result is consistent with the findings of previous studies which was conducted to investigate the antecedents of the intention to continuance use of mobile wallets by consumers (Routray et al., 2019; Talwar et al., 2020; Garrouch, 2021). Consequently, it can be inferred that perceived usefulness is a significant predictor of the intention to adopt and continuance use of mobile wallets.

Furthermore, the findings of this study revealed that perceived ease of use has a statistically significant positive direct effect on the intention to continuance use of mobile wallets. This outcome supports a conjecture that perceived ease of use is a significant predictor of the intention to adopt and continuance use of mobile wallets mobile, as it has been found a significant predictor of the intention to adopt mobile wallets by consumers (H. Amin, 2009; Kafsh, 2015; N. Shaw, 2015; Campbell, 2017; Al-Amri et al., 2018; Chakraborty & Mitra, 2018; Chatterjee & Bolar, 2019; Eappen, 2019; Isrososiawan et al., 2019; Reddy & Rao, 2019; Chawla & Joshi, 2020b; Karim et al., 2020; Singh et al., 2020). Nonetheless, this finding is not in line with a previous study conducted by (Garrouch, 2021).

Also, the findings of this study revealed that perceived ease of use of mobile wallets has a statistically significant positive direct effect on the perceived usefulness of mobile wallets. This result is consistent with the findings of previous studies which examined the intention to adopt mobile wallets by consumers (H. Amin, 2009; Swilley, 2010; S. Shin & Lee, 2014; Kafsh, 2015; Aydin & Burnaz, 2016; Campbell, 2017; Seetharaman et al., 2017; Chawla & Joshi, 2019; Eappen, 2019; B. Shaw & Kesharwani, 2019; Chawla & Joshi, 2020a, 2020b; Jin et al., 2020; Karim et al., 2020). Consequently, it might be theorized that perceived ease of use of mobile wallets is a significant predictor of the perceived usefulness of mobile wallets in the pre and post-adoption stages of mobile wallets. So far, the results indicate that when consumers find that mobile

wallets are useful and easy to use, they remain in continuous use. Moreover, the easier to use mobile wallets by consumers, the more they realize their usefulness.

While the subjective norm has a statistically significant positive direct effect on the perceived usefulness of mobile wallets, it has not been found to have a statistically significant effect on the intention to continue use. One possible reason is that due to maturation level, subjective norm impacts how useful consumers find mobile wallets, and, in turn, their intention to continue use. However, it does not directly impact their final decision in remaining in continuous use of mobile wallets. The relationship found between subjective norm and the intention to continuance use of mobile wallets is consistent with previous studies (Shin, 2009; Kafsh, 2015; Patel, 2016), which examined the intention to adopt mobile wallets by consumers. Also, the relationship found between subjective norm and perceived usefulness is consistent with a previous study conducted by (2019), which examined the intention to adopt mobile wallets by consumers. These outcomes support a conjecture that while subjective norm is not a significant predictor of the intention to adopt and continuance use of mobile wallets, it remains a potential predictor of consumers' perceived usefulness in the pre-adoption and the post-adoption stages of mobile wallets.

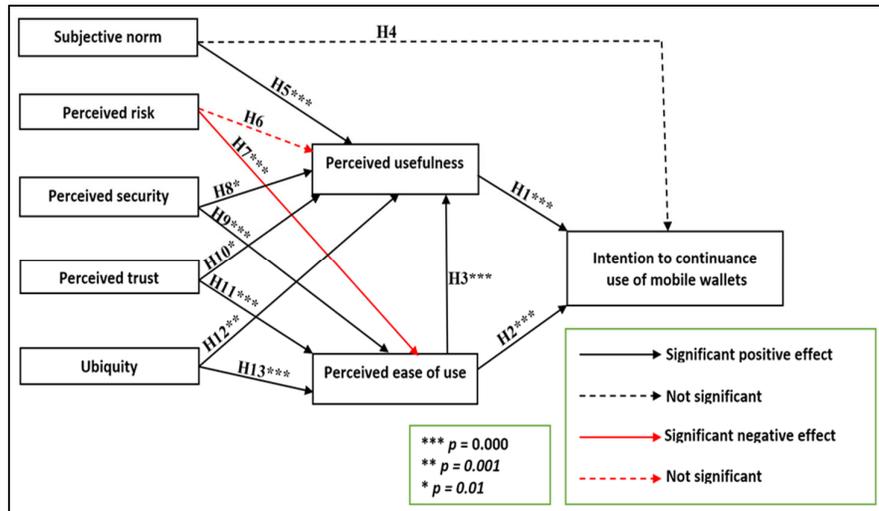


Fig. 2. Results of hypothesis testing

While perceived risk has a statistically significant negative direct effect on perceived ease of use, it has not been found to have a statistically significant effect on perceived usefulness. One possible reason is that consumers gain user experience with mobile wallets after a period of use, and, in turn, their feeling of being at risk might diminish. Therefore, perceived risk is not a critical predictor of the perceived usefulness of mobile wallets. Nonetheless, their fear of committing errors, which would put them at risk of financial loss, might persist, and that is why perceived risk had turned out to be a critical predictor of perceived ease of use of mobile wallets. Therefore, the less risky consumers find mobile wallets, the easier to use they perceive them, and, in turn, they are inclined to remain in continuous use of them.

Perceived security has statistically significant positive direct effects on perceived ease of use and perceived usefulness. This result is consistent with prior research findings, which examined the intention to adopt mobile wallets by consumers, on the relationship between perceived security and perceived ease of use (S. Shin & Lee, 2014; N. Shaw, 2015; Patel, 2016; Seetharaman et al., 2017), and perceived usefulness (N. Shaw, 2015). While this study found that perceived security has an indirect effect, through perceived ease of use and perceived usefulness, on the intention to continuance use of mobile wallets, a study conducted by (2020) found that perceived security has a statistically significant positive direct effect on the intention to continuance use of mobile wallets. Therefore, it can be inferred that perceived security is a significant predictor of perceived ease of use and perceived usefulness in the pre and post-adoption stages of mobile wallets. Thus, the more secure mobile wallets are perceived by consumers, the easier to use and useful they find them, and, in turn, the more likely they will remain in continuous use of them.

Perceived trust has statistically significant positive direct effects on perceived ease of use and perceived usefulness of mobile wallets. The relationship between perceived trust and perceived usefulness is consistent with the findings of previous studies which examined the intention to adopt (Eappen, 2019; Mahwadha, 2019). and continuance use (Talwar et al., 2020) of mobile wallets. Therefore, it can be inferred that perceived trust is a significant predictor of perceived usefulness in the pre-adoption and post-adoption stages of mobile wallets. Thus, the more perceived as trustworthy by consumers mobile wallets are the easier to use and more useful, they perceive them, and, in turn, the more inclined they are to remain in continuous use of them.

Ubiquity has statistically significant positive direct effects on perceived ease of use and perceived usefulness of mobile wallets. When consumers find mobile wallets ubiquitous, they realize their ease of use and usefulness in improving their lives in handling financial transactions, and, in turn, they are inclined to continue using them.

Table 7

Comparison between the results of the current study and previous studies on the pre-adoption stage of mobile wallets

Relationship	Direction and/or Significance of the relationship	Previous studies (Intention to adopt)	Current study (Intention to continuance use)
PU → BI	Positive and significant	(H. Amin, 2009; N. Shaw, 2014; S. Shin & Lee, 2014; M. K. Amin et al., 2015; Kafsh, 2015; N. Shaw, 2015; Patel, 2016; Seetharaman et al., 2017; Yadav, 2017; Al-Amri et al., 2018; Chakraborty & Mitra, 2018; Chatterjee & Bolar, 2019; Chawla & Joshi, 2019; Eappen, 2019; Isrososiawan et al., 2019; Mahwadha, 2019; B. Shaw & Kesharwani, 2019; Chan et al., 2020; Chawla & Joshi, 2020b, 2020a; Deka, 2020; Jin et al., 2020; Karim et al., 2020; Singh et al., 2020; Alwi et al., 2021; Tripathi et al., 2021)	✓
PU → BI	Insignificant	(Campbell, 2017)	
PEOU → BI	Positive and significant	(H. Amin, 2009; Kafsh, 2015; N. Shaw, 2015; Campbell, 2017; Al-Amri et al., 2018; Chakraborty & Mitra, 2018; Chatterjee & Bolar, 2019; Eappen, 2019; Isrososiawan et al., 2019; Reddy & Rao, 2019; Chawla & Joshi, 2020b; Karim et al., 2020; Singh et al., 2020; Alwi et al., 2021)	✓
PEOU → BI	Insignificant	(N. Shaw, 2014; S. Shin & Lee, 2014; M. K. Amin et al., 2015; Patel, 2016; Seetharaman et al., 2017; Yadav, 2017; B. Shaw & Kesharwani, 2019; Chan et al., 2020; Deka, 2020)	
PEOU → PU	Positive and significant	(H. Amin, 2009; Swilley, 2010; S. Shin & Lee, 2014; Kafsh, 2015; Aydin & Burnaz, 2016; Campbell, 2017; Seetharaman et al., 2017; Chawla & Joshi, 2019; Eappen, 2019; B. Shaw & Kesharwani, 2019; Chawla & Joshi, 2020b, 2020a; Jin et al., 2020; Karim et al., 2020)	✓
PEOU → PU	Insignificant	(Patel, 2016; Deka, 2020)	
SN → ITCU	Positive and significant	(Aydin & Burnaz, 2016; Madan & Yadav, 2016; Chakraborty & Mitra, 2018; B. Shaw & Kesharwani, 2019; Deka, 2020; Jin et al., 2020; Alwi et al., 2021)	
SN → ITCU	Insignificant	(D.-H. Shin, 2009; Kafsh, 2015; Patel, 2016)	✓
SN → PU	Positive and significant	(Mei & Aun, 2019)	✓
SN → PU	Insignificant	No studies were identified	
PR → PU	Negative and significant	No studies were identified	
PR → PU	Insignificant	No studies were identified	✓
PR → PEOU	Negative and significant	No studies were identified	✓
PR → PEOU	Insignificant	No studies were identified	
PS → PU	Positive and significant	(N. Shaw, 2015)	✓
PS → PU	Insignificant	No studies were identified	
PS → PEOU	Positive and significant	(S. Shin & Lee, 2014; N. Shaw, 2015; Patel, 2016; Seetharaman et al., 2017)	✓
PS → PEOU	Insignificant	No studies were identified	
PT → PU	Positive and significant	(Eappen, 2019; Mahwadha, 2019)	✓
PT → PU	Insignificant	No studies were identified	
PT → PEOU	Positive and significant	No studies were identified	✓
PT → PEOU	Insignificant	No studies were identified	
Ubiquity → PU	Positive and significant	No studies were identified	✓
Ubiquity → PU	Insignificant	No studies were identified	
Ubiquity → PEOU	Positive and significant	No studies were identified	✓
Ubiquity → PEOU	Insignificant	No studies were identified	

Note. PEOU: Perceived ease of use, PU: Perceived usefulness, SN: Subjective norm, BI: Behavioral intention, PT: Perceived trust, PS: Perceived security, PR: Perceived risk.

7. Conclusion

This study aimed to examine the factors affecting the intention to continuance use of mobile wallets by consumers in Jordan. Therefore, this study integrated perceived risk, perceived security, perceived trust, and ubiquity into TAM2. Results of the study revealed that whereas perceived ease of use and perceived usefulness have statistically significant positive direct effects on the intention to continuance use of mobile wallets, subjective norm does not. Also, results revealed that perceived security, perceived trust, and ubiquity have statistically significant positive direct effects on perceived usefulness and perceived ease of use, and, in turn, on the intention to continuance use of mobile wallets. In addition to that, it was found

that subjective norm and perceived ease of use have statistically significant positive direct effects on perceived usefulness, and, in turn, on the intention to continuance use of mobile wallets. Finally, whereas perceived risk has a statistically significant positive direct effect on perceived ease of use, and, in turn, on the intention to continuance use of mobile wallets, it does not affect perceived usefulness.

7.1 Practical implications

The findings of this research imply for mobile wallet service providers, financial institutions, and merchants the importance of considering perceived risk, perceived security, perceived trust, ubiquity, perceived usefulness, and perceived ease of use of mobile wallets as critical factors of the intention to continuance use of mobile wallets. Also, the findings of this study help mobile wallet service providers, financial institutions, and merchants to develop more effective consumer retention tactics and formulate appropriate marketing decisions. Perceived risk was found as a critical predictor of perceived ease of use of mobile wallets, and, in turn, the intention to continuance use of them. The implication of this is that the perceived risk associated with the use of mobile wallets should be low for consumers to realize their perceived ease of use, and, in turn, to remain in continuous use of them. Perceived security was found as a critical predictor of perceived ease of use and perceived usefulness of mobile wallets, and, in turn, the intention to continuance use of them. The implication of this is that if consumers perceive mobile wallets as secure, they realize their perceived ease of use and perceived usefulness, and, in turn, remain in continuous use of them. Perceived trust was found as a critical predictor of perceived ease of use and perceived usefulness of mobile wallets, and, in turn, the intention to continuance use of them. The implication of this is that the more perceived as trustworthy by consumers mobile wallets are the easier to use and more useful they perceive them, and, in turn, the more inclined they are to remain in continuous use of them. Ubiquity was found as a critical predictor of perceived ease of use and perceived usefulness of mobile wallets, and, in turn, the intention to continuance use of them. The implication of this is that the more ubiquitous mobile wallet services are, the easier to use and more useful consumers perceive them, and, in turn, the more inclined they are to remain in continuous use of them. Finally, perceived ease of use and perceived usefulness of mobile wallets were found as significant predictors of the intention to continuance use of mobile wallets. The implication of this is that the more perceived as easy to use and useful by consumers mobile wallets are the more inclined they are to remain in continuous use of them. Therefore, to incent consumers to remain in continuous use of mobile wallets. First, the design of mobile wallet applications should be based on the user-centered design notion, and, in turn, provide consumers with a more personalized and user-friendly experience. Second, through marketing campaigns, the usefulness of mobile wallets should be emphasized when compared to other payment methods. Third, mobile wallet services should be made as ubiquitous as possible to be used anywhere and at any time. Fourth, reducing risk and building security and trust are very crucial to consumers of mobile wallets. Fifth, social influence is critical to how consumers perceive the usefulness of mobile wallets, so mobile wallet service providers should be proactive in all campaigns, be it physical or virtual, to address consumer concerns and promote the usefulness of mobile wallets.

7.2 Research implications

The present study made a theoretical contribution to the literature related to the post-adoption stage of mobile wallets by consumers from a Jordanian perspective. The theoretical implications of integrating perceived risk, perceived security, perceived trust, and ubiquity into TAM2 demonstrated that perceived risk, perceived security, perceived trust, and ubiquity have positive direct effects on perceived ease of use of mobile wallets, and, in turn, on the intention to continuance use of them by consumers. Moreover, the analysis of the structural model revealed that while perceived security, perceived trust, and ubiquity are significant antecedents of the perceived usefulness of mobile wallets, and, in turn, on the intention to continuance use of them by consumers, perceived risk is not. Also, the outcomes of this research established that perceived usefulness and perceived ease of use of mobile wallets are significant positive determinants of the intention continuance use of mobile wallets by consumers.

7.3 Limitations

Besides the strengths of this study, it has several limitations. First, it excluded retailers who play an important role in the mobile wallets ecosystem by expanding the ubiquity of mobile wallets. Second, the data was collected from Jordan, which excluded those from the other countries in the middle east region. Future research should address the limitations incurred in this study.

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