



## Exploring the Usage Behavior of Mobile Wallet: An Empirical Study in Pakistan

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### Abstract

The objective of this study was to explore the factors influencing the usage behavior of mobile wallet (m-wallet) in Pakistan by using technology acceptance model (TAM). This study used the PLS-SEM analysis with 408 valid samples collected from Pakistani consumers using paper and online survey. The results presented that all three factors, including perceived usefulness (PU), perceived ease of use (PEOU), and intention to use (ITU) has positive and significant effect (direct and indirect) on m-wallet usage behavior. Based on results, this study provided the recommendations to m-wallet providers to expand the usage behavior of m-wallet in Pakistan.

**Keywords:** Technology acceptance model (TAM); M-wallet; Usage behavior; Pakistan

**JEL Codes:** N7

### 1. Introduction

The traditional payment means using cash have now been drastically swapped with e payment modes (de Almeida et al., 2018). The world economy is now one step closer to a cashless society, and the reason is emergence of digital wallet, e-commerce, mobile payments and other unconventional payment methods (World Payments Report, 2019). The users' attitude towards methods for mobile payment and their implementation has changed drastically with the rapid rise in cashless systems and digital mode of transactions around the globe (Aziz et al., 2021). Mobile payment services cater these needs of the user and provide technology support for multipurpose payment facility (Ibrahim et al., 2019). The merger of payment methods and advanced mobile technologies has changed conventional physical wallets into m-wallets (m-wallets) (Sharma et al., 2018). M-wallet is a technology that is needed to be installed on user's smart phone and allows the user to preload amount of money and then transfer it afterwards (Madan & Yadav, 2016; Singh, Srivastava, & Sinha, 2017). M-wallet support a wide range of transactions mechanisms like C2C – Consumer to Consumer, C2B – Consumer to Business, C2M – Consumer to Machine, C2O – Consumer to Online (Shin, 2009). M-wallet generally include four categories of payment services, i) direct carrier billing, ii) QR code or barcode scanning, iii) Near Field Communication (NFC) e.g. Payment system at Wall-Mart, iv) Cloud-based solution e.g. Paytm (Leong et al., 2020).

In Pakistan, Branchless Banking System regulations were firstly introduced in April 2008 to support and enhance the state of financial inclusion. The unbanked population of Pakistan was very low and still is at lower side that is not a good indicator for the economy of any country. The growth rate of digital payment methods in Pakistan is still low as compared to other countries (Saedi, 2019). To improve digital payment methods in Pakistan, there is a need to develop consumers' usage behavior of m-wallet. According to Davis et al. (1989), the usage behavior of m-wallet is determined by consumers' intention which itself explore by perceived usefulness (PU) and perceived ease of use (PEOU). Thus, this explores that how (directly or indirectly) PU, PEOU, Intention influences the usage behavior of m-wallet among Pakistani consumers by using technology acceptance model.

### 2. Literature Review

Technology acceptance model (TAM) predicts the consumer's acceptance of new information technologies. TAM explains the consumer acceptance through (i) perceived usefulness (PU) and (ii) perceived ease of use (PEOU) (Davis, 1989). PU is the extent up to which an individual believes that consuming a specific product would enhance or improve his or her work performance. People become more excited to use new technology if the technology is more useful and helpful for their routine life (Rehman & Shaikh, 2020). PEOU is the extent to which an individual accepts that the technology is effortless (Davis, 1989). If the system has simple interface and easy to use, the system is more useful for people. PU and PEOU eventually influence (directly and indirectly) the intentions and behaviors towards technology adoption (Davis, 1989). Unique feature of m-wallets that provide consumers benefits of using making transactions easier plays crucial role in affecting consumers to adopt new technology (Makanyeza, 2017). Moreover, a study was conducted in Japan related to m-wallet consumer adoption factors and established a relationship between attitude toward using and intention toward use of m-wallet (Amoroso et al., 2012; Audi et al., 2021; Audi et al., 2022). As per previous literature, intentions contribute 27% variance in behavior (Armitage & Conner, 2001). Another study conducted by proposed that 28% variance in behavior is predicted by intentions (Sheeran, 2002). Based on above discussions following hypotheses are proposed as figure 1 shows the proposed model:

**H1:** PU are positively associated with the Intention to Use (ITU) of m-wallet.

**H2:** PEOU is positively associated with ITU of m-wallet.

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- H3:** PEOU has positive relation with PU of m-wallet.
- H4:** ITU the m-wallet is positively associated with the usage behavior of m-wallet.
- H5:** PU mediates the relationship between PEOU and ITU m-wallet.
- H6:** ITU mediates the relationship between PU and Usage Behavior of m-wallet.

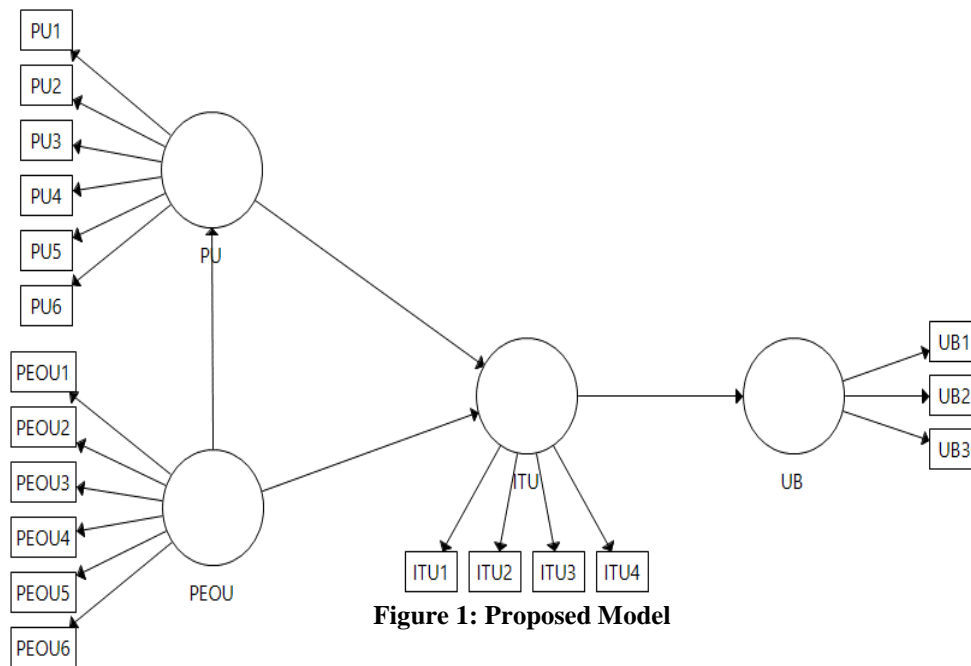


Figure 1: Proposed Model

**3. Research Methodology**  
**3.1. Instrument Design**

Table 1 Constructs and Their Scales

Constructs	Items	Sources
PU	“I think using mobile wallet would enable me to accomplish transactions more quickly”. “I believe mobile wallet would be useful for conducting online transactions”. “I believe using mobile wallet would improve my efficiency of online transactions”. “I think using mobile wallet would make it easier for me to make online payments”. “I believe mobile wallet improves the quality of online transaction”. “Overall, I think using a mobile wallet would improve my performance”.	“(Davis, 1989, Davis et al., 1989 and Venkatesh et al., 2003)”
PEOU	“I believe step by step navigation of mobile Wallet apps are easy to understand”. “I believe learning to use mobile wallet is easy”. “I like the fact that payments done through”. “Mobile wallets require minimum effort”. “I believe it is easy to transfer money through mobile wallet as minimum steps are required”. “Overall, I think mobile wallet is very easy to use”.	“(Davis, 1989, Davis et al., 1989 and Venkatesh et al., 2003)”
ITU	“I would like to do transactions using mobile wallet in the near future”. “It is very likely that I will use my smartphone to pay at the point-of-sale”. “I will frequently use Mobile Wallet in future”. “I intend to recommend others to use Mobile Wallet”.	“(Venkatesh et al., 2003)”
M-wallet Usage Behavior (UB)	“I regularly use Mobile wallet”. “I use Mobile wallet in my daily purchase transaction”. “I always use Mobile wallet in my business transaction”.	(Barry and Jan, 2018)

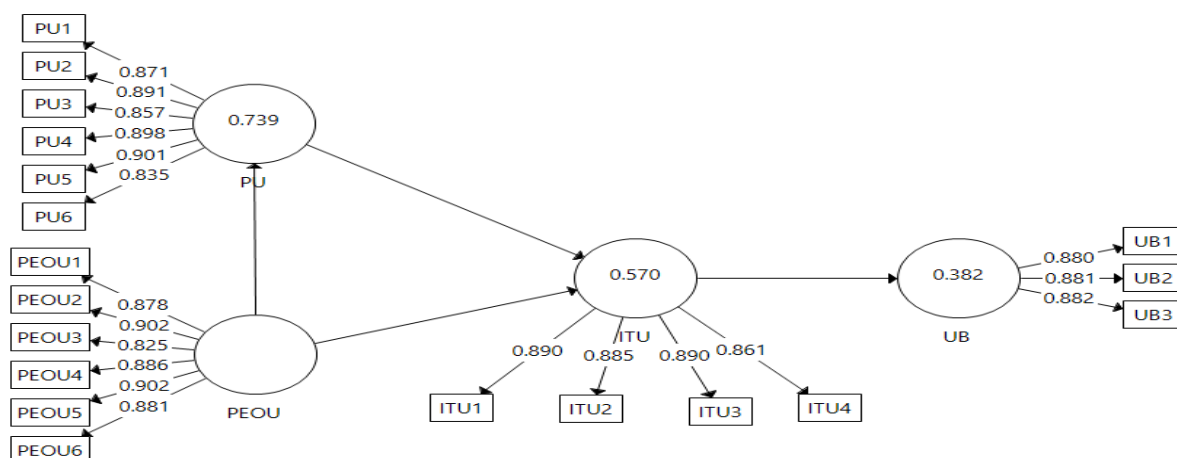
Table 1 describes the instrument items depending on Technology Acceptance Model (TAM) and expensive literature of m-wallet related studies. The questionnaire used in this study was adopted from Davis (1989), Davis et al., (1989), Venkatesh et al., (2003) and Barry and Jan, (2018) to find the m-wallet usage behavior. Seven-point Likert scale was used to evaluate the questionnaire items. The questionnaire was mainly divided into two parts including (a) demographics and (b) instrument items representing the four constructs i.e., PU, PEOU, ITU and m-wallet usage behavior. A pilot study was conducted to by collecting 30 responses to ensure the validity of instrument.

### 3.2 Sample Size and Data Collection

To collect the responses, survey (online and offline) was conducted from October 2021 to January 2022. The targeted population was the consumers those are using or intended to use mobile wallet in Pakistan from seven foremost cities of Pakistan including Lahore, Islamabad, Rahim Yar Khan, Karachi, Bahawalpur, Multan, Faisalabad, and. Overall, 690 questionnaires were disseminated to consumers. For dissemination of questionnaires, convenience sampling technique was used. The final sample size was 408 questionnaires having 59.13% response rate. Table 2 exhibits the demographics of respondents.

**Table 2 Respondents' Demographics**

Variables	Category	Frequency	Percentage
Gender	Male	268	65.7
	Female	140	34.3
Age	"20–30 years"	156	38.2
	"31–40 years"	174	42.6
	"41–50 years"	66	16.2
	"51–60 years"	11	2.7
	"More than 60 years"	1	.2
Using Status	Users	407	99.8
	Non-Users	1	.2
Education	"Intermediate"	35	5.4
	"Undergraduate"	184	28.3
	"Graduate"	221	34.0
	"Postgraduate"	169	26.0
	"Professional"	41	6.3
Occupation	Student	156	24.0
	Employee	148	22.8
	Business	143	22.0
	Retired	203	31.2
	Other	5	1.2



**Figure 2. Outer Loadings of All Indicators**

## 4. Analysis and Results

### 4.1 Measurement Model (Step 1)

The measurement model was evaluated using two main validities (i) Convergent Validity and (ii) Discriminant Validity. Convergent validity is used to evaluate the connection of indicators with its construct using outer

loadings, composite reliability (CR) and average variance extracted (AVE). All the constructs have good reliability and convergent validity as outer loadings of all indicators are greater than 0.7, Cronbach's Alpha values are above the threshold value that is 0.7, CR are greater than 0.7 and finally the AVE values are also above the threshold value that is 0.5 as proposed by Hair et al., (2021). The results are given in Table 3 and Figure 2. based on Fornell and Larcker (1981) criterion and Heterotrait – Monotrait (HTMT) criteria, results are also satisfactory as the AVE values lie between 0.767 (PU) to 0.777 (ITU) and HTMT values are less than 0.90 (Hair et al., 2021). The results of discriminant validity are given in Table 4.

**Table 3 Measurement Model**

Constructs	Items	Loadings	Cronbach's Alpha	CR	AVE
ITU	ITU1	0.890	0.904	0.933	0.777
	ITU2	0.885			
	ITU3	0.890			
	ITU4	0.861			
PEOU	“PEOU1”	0.878	0.941	0.953	0.773
	“PEOU2”	0.902			
	“PEOU3”	0.825			
	“PEOU4”	0.886			
	“PEOU5”	0.902			
	“PEOU6”	0.881			
PU	“PU1”	0.871	0.939	0.952	0.767
	“PU2”	0.891			
	“PU3”	0.857			
	“PU4”	0.898			
	“PU5”	0.901			
	“PU6”	0.835			
UB	UB1	0.880	0.856	0.912	0.776
	UB2	0.881			
	UB3	0.882			

**Table 4 Discriminant Validity (Fornell-Larcker Criterion and HTMT)**

	1	2	3	4
1. ITU	0.882			
2. PEOU	0.744 (0.806)	0.879		
3. PU	0.705 (0.764)	0.860 (0.813)	0.876	
4. UB	0.618 (0.699)	0.684 (0.758)	0.687 (0.761)	0.881

Note: HTMT values are in bracket

#### 4.2 Structural Model (Step 2)

The causal relationships in structural model are evaluated by using path coefficients, t-values, and  $R^2$ . The findings revealed that  $R^2$  score for PU was 0.570, showing the moderately strong score. Moreover,  $R^2$  score for ITU of m-wallet was 0.739 and  $R^2$  score for usage behavior was 0.382, showing the moderately strong scores (Hair et al., 2011).

The findings suggested that all the hypotheses (H1 to H6) are supported. PU significantly influences the intention to use m-wallet ( $\beta = 0.248$ ,  $t = 3.682 > 1.64$ ,  $p < 0.05$ ). PEOU significantly influences the intention to use m-wallet ( $\beta = 0.531$ ,  $t = 8.895 > 1.64$ ,  $p < 0.05$ ). PEOU significantly influences the PU ( $\beta = 0.860$ ,  $t = 29.748 > 1.64$ ,  $p < 0.05$ ). ITU m-wallet significantly influences the usage behavior of m-wallet ( $\beta = 0.618$ ,  $t = 12.642 > 1.64$ ,  $p < 0.05$ ). In addition, PU ( $\beta = 0.213$ ,  $t = 3.696 > 1.64$ ,  $p < 0.05$ ) played the mediating role between PEOU and ITU m-wallet. Furthermore, findings showed that ITU m-wallet ( $\beta = 0.153$ ,  $t = 3.218 > 1.64$ ,  $p < 0.05$ ) mediated the relationship of PU and usage behavior of m-wallet.

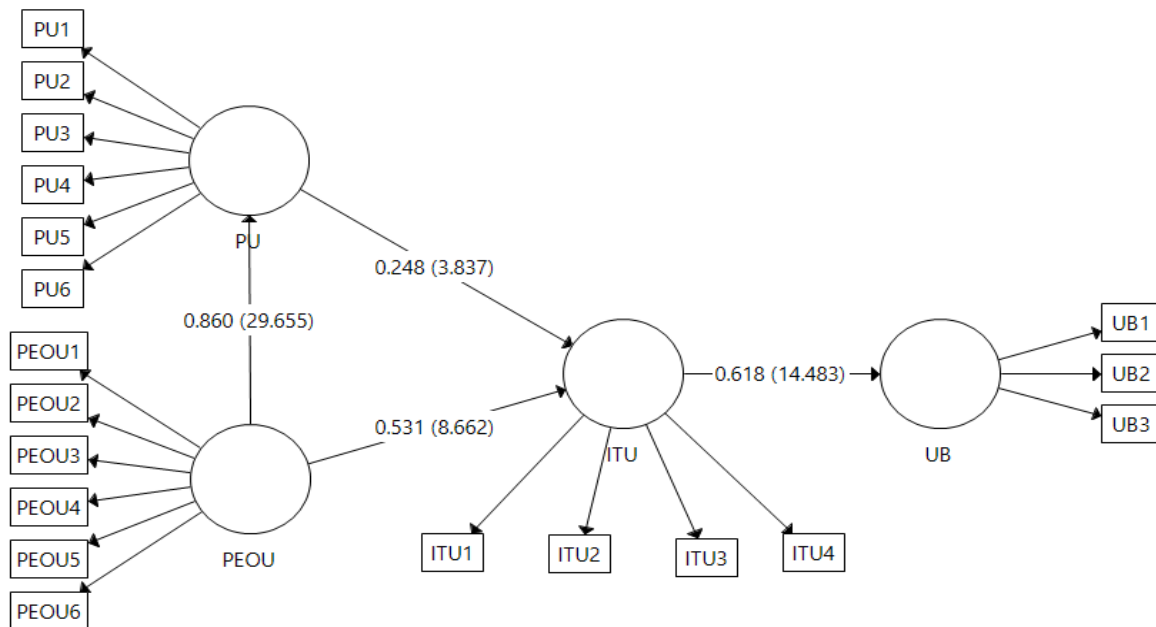


Figure 3 Path Coefficients and T-Values of the Structural Model

Table 5 Main Effects and Mediating Effects

H <sub>i</sub>	Paths	“Original Sample” (O)	“Sample Mean” (M)	“Standard Deviation” (STDEV)	“T Statistics” ( O/STDEV )	“P Values”
H1	PU -> ITU	0.248	0.246	0.067	3.682	0.000
H2	PEOU -> ITU	0.531	0.531	0.060	8.895	0.000
H3	PEOU -> PU	0.860	0.861	0.029	29.748	0.000
H4	ITU -> UB	0.618	0.618	0.049	12.642	0.000
H5	PEOU -> PU -> ITU	0.213	0.211	0.058	3.696	0.000
H6	PU -> ITU -> UB	0.153	0.153	0.048	3.218	0.001

“ \*p<0.05, \*\*p<0.01 ”

## 5. Discussion and Conclusion

Theoretically, this study explores the direct and indirect relationships between the variables named as PU, PEOU, ITU and UB by using TAM. Findings of this study suggest PU has positive and significant effect (directly and indirectly) on ITU regarding m-wallet. It can be interpreted as higher PU related to e-wallet among Pakistani consumers increase the ITU m-wallet. PEOU has positive and significant effect on PU and ITU regarding m-wallet. It can be interpreted as higher PEOU of e-wallet increase the ITU m-wallet among Pakistani consumers. Moreover, ITU m-wallet has positive and significant effect (directly and indirectly) on UB of m-wallet, meaning higher intention towards m-wallet lead to develop the actual usage behavior of m-wallet. Based on findings, the study suggested that e-wallet related companies should develop the strategies and approaches to increase the PU and PEOU among consumers. It will help to develop positive intention to use m-wallet among consumers that will ultimately increase the usage behavior of m-wallet as the adoption of m-wallet is becoming the essential part of mankind life. Moreover, the study can be extended by using other behavioral related theories including theory of planned behavior and behavioral reasoning theory in order to fully explore the usage behavior of m-wallet in Pakistan. With this, the study can also be expanded in cross culture perspective.

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