

Intention to use mobile wallet by youths in northeast India

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Abstract

This study aims to understand the implication of established variables/factors on intention to use mobile wallet by youths, especially in the North-Eastern Part of India. The factors are identified through the literature review. A questionnaire with elements from established scales which were then customized for the study was used to collect data (Received valid 119 samples). Partial Least Square based Structural Equation Modelling through SmartPLS v3.0 was used to understand the effect of factors on the use intention and on the validity and reliability of the constructs used in the model. The study revealed that use intention is significantly influenced by attitude towards the mobile wallet, perceived security, and perceived usefulness. Whereas the attitude towards the mobile wallet is significantly influenced by facilitating conditions and perceived compatibility. Social influence and promotions were also found to influence use intention of the mobile wallet.

Keywords: SEM, Smart PLS, Use Intention, Mobile Wallet, India

Introduction

Mobile phones are now providing a range of services, including communication, access to internet, entertainment, and commerce. And thus, are becoming an essential part of every person's day to day life. With the internet now reaching every nook and corner of India, mobile phones are extensively used for e-commerce, as most people do not have access to a PC for internet browsing.

This e-commerce mainly done through mobile phones has given rise to m-commerce that is, using mobile phone devices for buying products and services through the internet. This necessitates the emergence of mobile payment mechanism as mobile phones are now one stop solution for all m-commerce needs. Dahlberg et al. (2008) defined mobile payment as 'payments for goods, services and bills with a mobile device such as mobile phone, etc. by taking advantage of wireless and other communication technologies.' Mobile payment is thus emerging as a strong alternative to other payment methods like cash, credit card, debit cards etc.

Mobile Wallets

Mobile wallets are can be considered as a medium to make instant payments and undertake transactions through smart phones. The consumers can save their banking details and personal information, payment history, shopping details etc. in mobile wallets. They allow consumers to use their credit or debit cards for various baking transactions like shopping, bill payments, fund

transfers, booking tickets and so on. Since mobile wallets use is increasing in India, hence the need to study the various facets of the use of mobile wallets is needed. Though various studies have already been conducted in Indian market (Dasgupta et al., 2011; Singh et al., 2017), regarding mobile wallets, still many areas are not yet touched upon.

Literature review

Most research in the field of mobile wallet relates to the adoption of mobile wallets as a medium for payment or exchange. Since the mobile wallet is considered as a electronic device, hence most of the research studies are based on the established models of Technology Acceptance Model (TAM) proposed by Davis (1989), Theory of Reasoned Action (TRA) by Fishbein and Ajzen (1975) and the Theory of Planned Behaviour (TPB) by Ajzen (1991).

- In Theory of Reasoned Action (TRA), it was established that behavioral intention is influenced by attitudes and subjective norms (Fishbein & Ajzen, 1975). ‘Attitude’ was defined as, ‘degree of a person’s favorable or unfavorable evaluation or appraisal of the behavior in question’.
- Ajzen (1991) extended TRA in the form of Theory of Planned Behavior (TPB) by including perceived behavioral control construct, i.e. the perceived ease or difficulty of performing the behavior and also introduced subjective norms which relate to the effect of the society on one’s behavior . TPB also assumes that behavior is influenced by the intention to perform a behavior.
- Davis (1989), also extended TRA through Theory of Acceptance Model (TAM), postulated that perceived usefulness and perceived ease of use influences the attitudes of individual towards creating behavioral intention which finally leads to actual use of the technology.
- Venkatesh et al. (2003) postulated the famous Unified Theory of Acceptance and Use of Technology (UTAUT) model combining eight established models: Technology Acceptance Model (TAM); Innovation Diffusion Model (IDT); Theory of Reasoned Action (TRA); Motivation Model (MM), TPB (Theory of Planned Behavior), Combined TAM and TPB, MPCU (Model of PC Utilization), and Social Cognitive Theory (SCT). (UTAUT) which was based on above models and similar constructs which used different definitions and different names. The constructs defined were - effort expectancy, performance expectancy, social influence and facilitating conditions which were found to influence behavioral intentions.
- Linck et al. (2007) found that effort expectancy, performance expectancy, facilitating conditions and social influence, affect intention to use mobile payment systems.
- Parasuraman et al. (2005) proposed E-S-QUAL, a scale to for measuring e-service quality by defining core dimensions – efficiency, system availability, fulfillment, and privacy/security.
- Shin (2009), found TAM constructs like ease of use and perceived usefulness along with perceived security, social influences and trust has a significant effect on user’s attitude towards mobile wallets.
- Compatibility, personal innovativeness, social influence, perceived risk and relative advantage were identified as significant factors influencing intention to adopt mobile payment systems by Yang et al. (2012).
- Mobile wallets provide additional benefits to users like minimum interest rates, loyalty benefits, cash benefits etc. which also inspires customers to prefer mobile wallets for banking transactions (Thakur, 2013).

Thus, the factors perceived usefulness, perceived ease of use, social influence, facilitating conditions, perceived compatibility, personal security, and company promotions (coupons, cash back etc.) are identified as constructs for the study.

These models are used under various conditions and with various samples and the reliability and validity of the models have been proved for the mobile wallets. However, the author could not locate any such study for the youths of North-East India. Thus, the use intentions of mobile wallets in North-East Indian markets are clearly a gap which needs to be addressed

Perceived Ease of Use (EOU)

Perceived ease of use is one of the core dimensions that have an influence on the acceptance of new technologies (Davis et al., 1992; Moore & Benbasat, 1991). It basically denotes the perception of the consumers as to how easy it is to use the system. (Davis, 1989). As confirmed in empirical studies, perception of the ease of use in technological system has a significant impact of user's attitude towards the system and their use intention (Gefen et al., 2003; Teo et al., 1999).

Perceived Usefulness (PU)

Davis (1989) postulated that if a user finds a system useful, he/she will develop a positive attitude about it, and thus uses the system to obtain the benefit, if able to use the system. Customers indicate that if these new systems make their lives easier, then the systems are useful (Moore & Benbasat, 1991).

Social Influence (SI)

Ajzen & Fishbein (1980) introduced the concept of subjective norms in the Theory of Reasoned Action (TRA) model, as it tries to describe behaviour beyond the use of technology. The construct looks at the influence of others in one's attitudes and use intentions. Social influence has a direct positive effect on behaviour intention to use technology has been posited by Ajzen (1991), Venkatesh & Davis (2000), Lee et al. 2003).

Facilitating Conditions (FC)

Introduced by Venkatesh et al. (2003) in the UTAUT model to cover the degree to which an individual believes that an infrastructure exists to support the use of the technology. It is observed that facilitating conditions directly influences behavioural intention (Ajzen, 1991; Taylor & Todd, 1995).

Perceived Security (PS)

Attitude towards the mobile payments has also been seriously affected by the concerns for security of information, data, money etc. (Linck et al., 2007; Shatskikh, 2013). Many paid digital services are also affected by the security concerns. (Pousttchi & Wiedemann, 2007).

Perceived Compatibility (PC)

Moore & Benbasat (1991) defined Compatibility as the degree to which a new system is perceived as consistent with the existing values, beliefs, experience and need of the individual. Compatibility is found to have a strong effect on acceptance of mobile payment systems (Chen & Nath, 2008). Attitude towards mobile payment system is affected by Compatibility (Kim et al., 2010; Lu et al., 2011).

Promotion (P)

Customers concentration on ads increases when the message includes benefits (Kim & Han, 2014) and consumers are willing to make an extra effort to obtain the tangible incentives (Kim &

Han, 2014); Varnali et al., 2012) Company marketing promotion in terms of tangible benefits like free gifts, coupons etc. or intangible benefits, like cash backs, monetary incentives etc. can be considered as extrinsic motivation.

Thus, the following hypotheses are proposed after literature review:

- H1:** Perceived Ease of Use has a significantly positive effect on perceived usefulness
- H2:** Perceived Ease of Use has a significantly positive effect on attitude towards use of mobile wallet.
- H3:** Perceived Ease of Use has a significantly positive effect on the use intention of mobile wallet.
- H4:** Perceived Usefulness has a significantly positive effect on attitudes towards the use of mobile wallet.
- H5:** Perceived Usefulness has a significantly positive effect on use intention of mobile wallet.
- H6:** Social Influence has a significantly positive effect on the attitude towards the use of mobile wallet.
- H7:** Social Influence has a significantly positive effect on the use intention of mobile wallet.
- H8:** Facilitating Conditions has a significantly positive effect on the attitude towards the use of mobile wallet.
- H9:** Facilitating Conditions has a significantly positive effect on the use intention of mobile wallet.
- H10:** Perceived Security has a significantly positive effect on the attitude towards the use of mobile wallet.
- H11:** Perceived Security has a significantly positive effect on the use intention of mobile wallet.
- H12:** Perceived compatibility has a significantly positive effect on the attitude towards the use of mobile wallet.
- H13:** Perceived compatibility has a significantly positive effect on the use intention of mobile wallet.
- H14:** Promotion has a significantly positive effect on the attitude towards the use of mobile wallet.
- H15:** Promotion has a significantly positive effect on the use intention of mobile wallet.
- H16:** Attitude towards the use of mobile wallet has a significantly positive effect on use intention of mobile wallet.

Research Framework

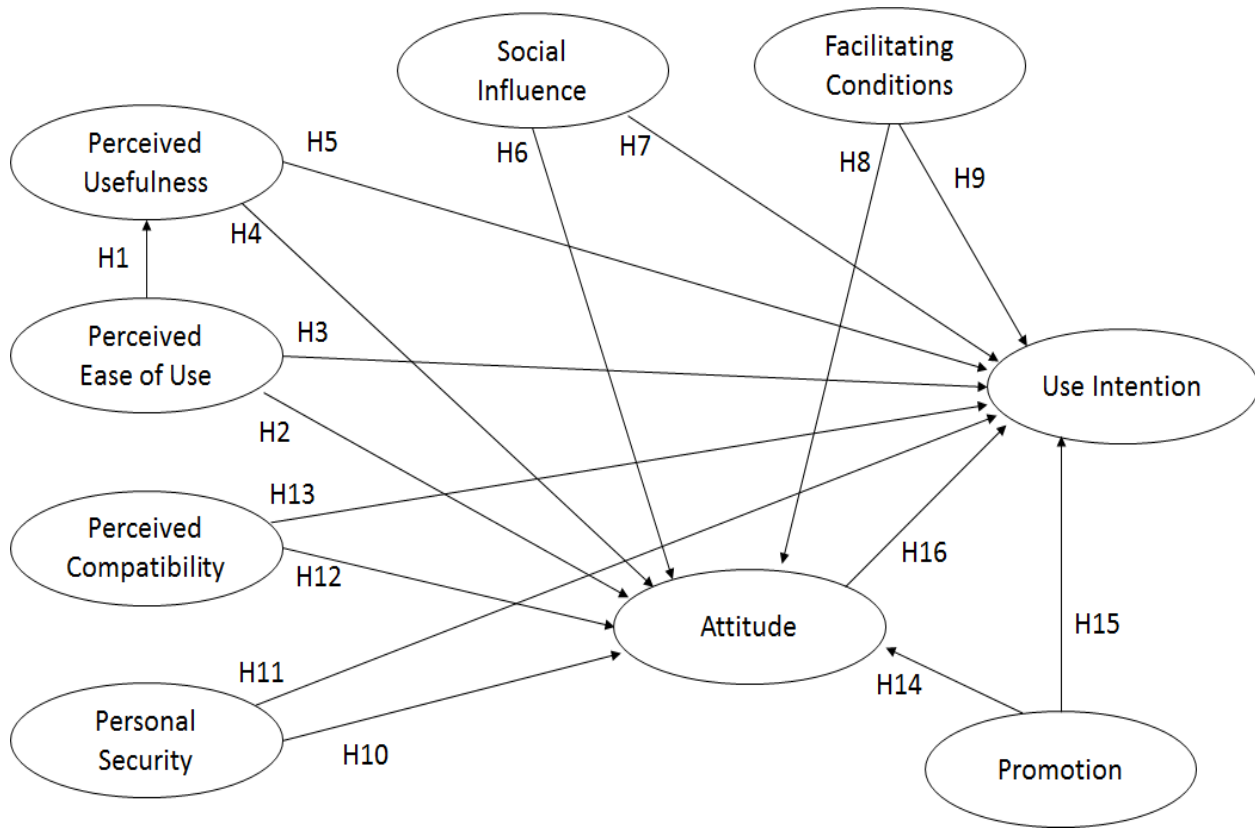


Figure 1: Research Framework

Research Methodology

Research Objective

The purpose of this research study includes:

- Develop and test a model to better understand the factors influencing the attitude and use intention towards mobile wallets.
- Identify the impact of perceived ease of use, perceived usefulness, compatibility, personal security, social influence, and promotion on attitude towards use of mobile wallet
- Understand the impact of perceived usefulness, perceived ease of use, social influence, facilitating conditions, attitude, and promotions on use intention of mobile wallets.

Research Design

Based on the framework defined in the research, a pilot study among 30 samples was conducted to understand the relevance of items in the questionnaire and to obtain suitable wordings of the variables. After the suggested changes were made, the final questionnaire was used for final sampling. Once sufficient data are collected, reliability and validity and partial least square structural modelling was conducted using SMART PLS v3 to understand the relationships between the various constructs. Partial Least Square Structural Equation Modelling has been utilized in the study with the help of SmartPLS (v3) Software. SEM based on partial least squares is better equipped against the covariance-based SEM when the study is exploratory in nature and the need is to understand the predictive nature of the constructs.

Method of Data Collection

This study is oriented on primary data collected through hardcopy by questionnaire and also through Google Forms Questionnaire. Convenience and Snowball sampling techniques was employed to collect the data. The Study was conducted in Guwahati City of Assam, a state of India during the month of November – December 2019. The survey was conducted in two months.

Sampling size

The sample size was taken as 300 and questionnaires were sent to all the consumers or they were approached. However, only 119 responses were found to be valid and clear enough to be used for further analysis.

Instrument

A questionnaire was used to collect data. All questions were with the option in answering in the Likert scale with representing ‘Strongly Agree’ to ‘Strongly Disagree’ at the extreme ends. The questionnaire construction is done with the help of following scales-

Table 1: Scale and construct

Construct	No. of items	Source (s)
Perceived ease of use	5	Davis, 1989; Venkatesh & Davis, 2000
Perceived usefulness	6	Bhattacharjee, 2001, Van der Heijden, 2004
Social Influence	4	Ajzen, 1991, Venkatsh & Davis, 2000
Facilitating Conditions	4	Venkatsh et al., 2003
Perceived Security	5	Luarn & Lin, 2005; Parasuraman et al., 2005
Perceived Compatibility	4	Agarwal & Prasad, 1998; Moore & Benbasat, 1991; Plouffe et al., 2001
Promotions	3	Author generated
Attitude	4	Ajzen, 1991
Use Intention	4	Bhattacharjee, 2001; Venkatash & Davis, 2000

Analysis and Interpretations.

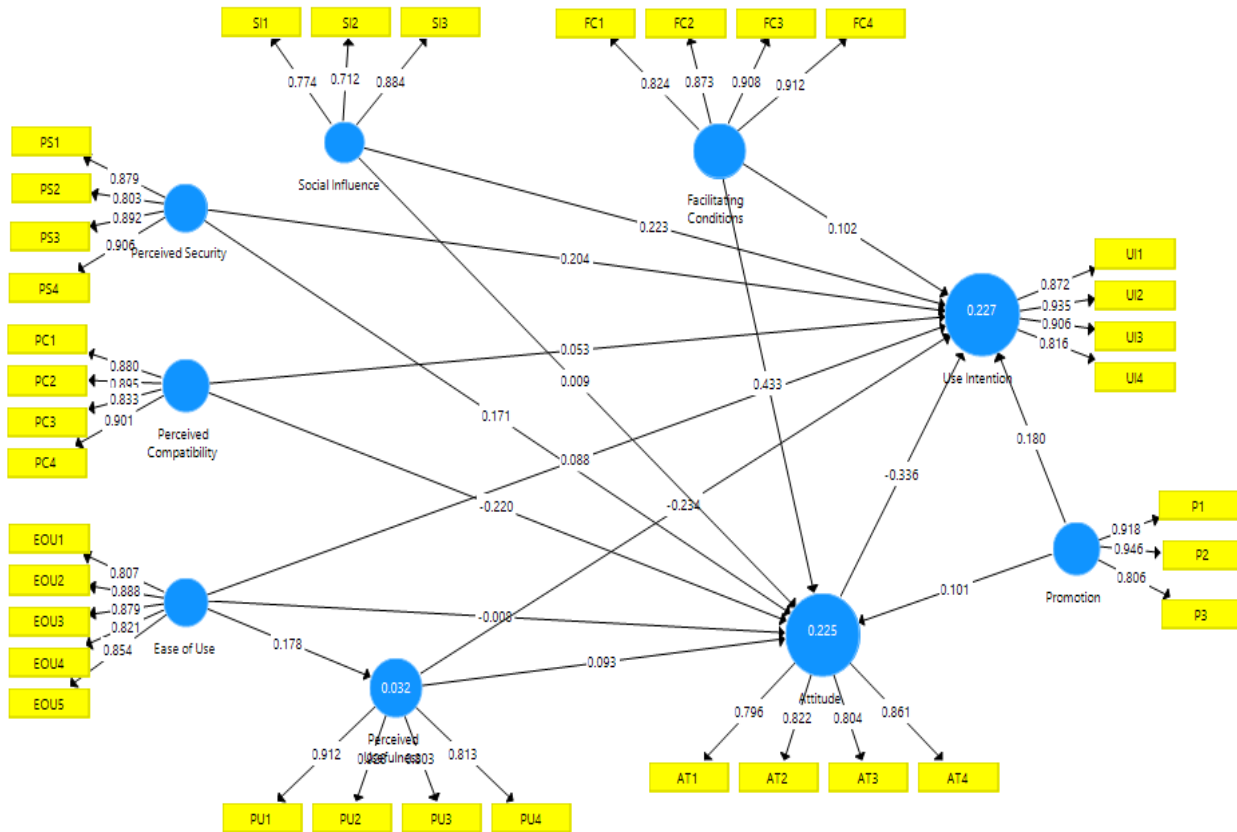


Figure 2: Framework as implemented for SEM in SmartPLS v3

Outer loadings (Table 2), and other significant parameters of SEM are discussed below:

Table 2

Construct	Code	Item	Factor Loading	VIF
Perceived Usefulness	PU1	I think MP is useful for me to buy products or services	0.912	3.010
	PU2	I think MP makes it easier for me to buy products or services	0.928	3.230
	PU3	I think MP saves time for me to buy products or services	0.803	2.536
	PU4	Using mobile payments would make it easier for me to conduct transactions	0.813	2.584
	PU5	Using mobile wallet would take more time and effort than using traditional payment methods	Removed because of low loading	

Perceived Ease of Use	EOU1	I think using mobile wallet is easy	0.807	3.157
	EOU2	My interaction with a mobile wallet would be clear and understandable	0.888	3.498
	EOU3	It would be difficult for me to become skilful at using a mobile wallet	0.879	3.411
	EOU4	I think it is easy for me to learn how to use mobile wallet	0.821	2.181
	EOU5	It is easy to perform the steps required to use mobile wallet	0.854	2.227
Perceived Security	PS1	The risk of abuse of usage information (e.g. names of business partners, payment amount) is low when using a mobile wallet	Removed because of low loading	
	PS2	The risk of abuse of billing information (e.g. credit card number, bank account data) is low when using a mobile wallet	0.879	2.998
	PS3	I find mobile payment services secure for conducting my payment transactions	0.803	2.413
	PS4	I am not afraid for unreasonable or fraudulent charges if using a mobile wallet	0.892	2.199
	PS5	I am comfortable with having my credit card integrated into my mobile phone	0.906	2.864
Social influence	SI1	People who are important to me would find using mobile services beneficial	0.774	1.245
	SI2	People who influence my behaviour think I should use mobile wallet	0.712	1.691
	SI3	Using mobile wallet service would reflect my personality to others	0.884	1.732
	SI4	I will use mobile wallet services if the services are widely used by people in society	Removed because of low loading	
Perceived Compatibility	PC1	I would appreciate using mobile payment services in a restaurant/ café/ bar instead of alternative modes of payment (e.g. credit card/ cash)	0.880	2.888

	PC2	I think the mobile wallet is not compatible with my lifestyle	0.895	4.555
	PC3	Using mobile wallet at a restaurant / café/ bar fits well with the way I like to purchase products and services	0.833	2.183
	PC4	Using the mobile wallet is compatible with all aspects of my shopping behaviour	0.901	4.492
Intention to use	UI1	I am willing to use mobile wallet services in near future	0.872	2.421
	UI2	I am willing to continue using mobile wallet services in near future	0.935	4.113
	UI3	I intend to use/ continue using mobile payment services at least as often within the next month as I have previously used	0.906	3.594
	UI4	I intend to use mobile payment services when the opportunity arises	0.816	2.522
Attitudes	ATT1	Using the mobile wallet is a good idea	0.796	2.103
	ATT2	Using the mobile wallet is beneficial	0.822	2.195
	ATT3	Using the mobile wallet is favourable	0.804	1.626
	ATT4	Using the mobile wallet is a wise thing to do	0.861	2.252
Facilitating Conditions	FC1	I have an internet enabled mobile phone to use mobile wallet services for payment	0.824	1.912
	FC2	I have enough knowledge to use mobile wallet services for purchasing products	0.873	3.217
	FC3	I think so many vendors accept mobile wallet service now-a-days	0.908	2.925
	FC4	Support of an individual or service is available when problems are encountered with mobile wallet services	0.912	3.950
Promotion	P1	I like the promotional offers offered for using mobile wallets	0.918	2.721

	P2	I use mobile wallet because of the promotional offers	0.946	2.654
	P3	I get benefitted from the promotional offers for using mobile wallets.	0.806	2.614

Multi-collinearity

If multicollinearity is present, the structural path coefficients do not reliably assess the relative importance of predictor variables. To test multicollinearity, VIF (Variance Inflation Factor) criteria may be applied. Possible multicollinearity is reflected if tolerance is <0.20 (Tolerance = 1 – R Square). This corresponds to VIF greater than 5 (Garson, 2016). And the output generated from Smart PLS, v3.0 as enclosed as Table 2 above. The output clearly shows that there is no VIF value greater than 5, hence there is no multicollinearity present.

Construct Reliability

The internal consistency reliability of the measure is reflected by composite reliability coefficient. Cronbach’s Alpha coefficient can also be considered to reflect reliability coefficient, it however, considers all items contribute equally to the latent variables without considering the actual contribution of each individual loading.

The Confirmatory Factor Analysis (CFA) was done to test the reliability, convergent validity, and discriminant validity of all the items in the measurement model. The detailed output is shown in the tables/figures below with their interpretations. All items loading was above the minimum cut off point of 0.50 and thus internal consistency was achieved.

Cronbach’s alpha was also tested to check the reliability of the constructs and all the coefficients are above 0.70 to verify the reliability of the constructs in the model. (Hair et al., 2017)

Convergent Validity

Whether multiple items used to measure the same concept agree or not is checked via the Convergent validity. In Figure 3, below shows the Composite reliability (CR) of the latent variables. In the output that was obtained from SmartPLS v3, the range of CR values is 0.835 to 0.934, which is well above the minimum acceptance range of 0.70 suggesting internal consistency reliability of the measures used in the study. In terms of the convergent validity, all average variance extracted (AVE) meet the minimum criteria of 0.50 with CR above 0.70. (Garson, 2016)

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Attitude	0.842	0.857	0.892	0.675
Ease of Use	0.909	0.946	0.929	0.723
Facilitating Conditions	0.903	0.923	0.932	0.774
Perceived Compatibility	0.901	0.913	0.931	0.770
Perceived Security	0.901	0.978	0.926	0.759
Perceived Usefulness	0.896	0.998	0.923	0.750
Promotion	0.893	0.967	0.921	0.795
Social Influence	0.730	0.783	0.835	0.629
Use Intention	0.907	0.934	0.934	0.780

Figure 3: Construct Reliability and Validity

Discriminant Validity

Discriminant validity checks whether the measure of interest is not a reflection of some other variable. This can be tested by the correlation between the measure of interest and other constructs. In SmartPLS, discriminant validity is checked by comparing the squared correlation between the construct and variance extracted for a construct. The output obtained from SmartPLS v3.0 is shown in Figure 4a, and 4b below, if in the Fornell-Larcker criterion table, the square root of AVE (diagonal value) is greater than the correlations below it, then there is discriminant validity (Garson, 2016).

Fornell-Larcker Criterion						
	Attitude	Ease of Use	Facilitating Conditions	Promotion	Social Influence	Use Intention
Attitude	0.821					
Ease of Use	0.174	0.850				
Facilitating Conditions	0.395	0.233	0.880			
Perceived Compatibility	-0.268	-0.199	-0.249			
Perceived Security	-0.083	0.093	-0.367			
Perceived Usefulness	0.004	0.178	-0.229			
Promotion	0.102	0.030	-0.077	0.892		
Social Influence	0.057	0.212	0.134	-0.195	0.793	
Use Intention	-0.282	0.073	-0.028	0.030	0.181	0.883

Figure 4a: Discriminant Validity

Fornell-Larcker Criterion			
	Perceived Compatibility	Perceived Security	Perceived Usefulness
Attitude			
Ease of Use			
Facilitating Conditions			
Perceived Compatibility	0.878		
Perceived Security	0.417	0.871	
Perceived Usefulness	0.095	0.114	0.866
Promotion	-0.220	-0.137	0.115
Social Influence	0.032	0.039	0.126
Use Intention	0.130	0.182	-0.166

Figure 4b: Discriminant Validity

Thus, measurement model was satisfactory and provided sufficient evidence to accept its reliability, convergent validity, and discriminant validity.

Coefficient of Determination

Coefficient of Determination measures the structural model as thus, from the output table, 22.5% variance in attitude is explained by its antecedents described in the mode. 22.7% of the variance in Use Intention is described by the antecedents described in the model. And can be considered in the moderate regions (Garson, 2016)

R Square

	R Square	R Square Adjusted
Attitude	0.225	0.177
Perceived Usefulness	0.032	0.023
Use Intention	0.227	0.171

Fig.5. R-Square

F-Square

The F-Square expresses how large a proportion of unexplained variance is accounted by R square change (Garson, 2016). Almost all the factors predicted in the model are contributing (‘Small effect’) towards the attitude and use intentions. However, in case of attitude towards mobile wallet, facilitating condition seems to be the main contributing factor (0.173 as ‘medium’ effect). In case of Use intention towards mobile wallet, Attitude towards the mobile wallet seems to be the main contributing factor at 0.113 representing a ‘medium’ effect. (Garson, 2016)

f Square

	Attitude	Ease of Use	Facilitating Conditions	Promotion	Social Influence	Use Intention
Attitude						0.113
Ease of Use	0.000					0.008
Facilitating Conditions	0.173					0.008
Perceived Compatibility	0.046					0.003
Perceived Security	0.026					0.036
Perceived Usefulness	0.010					0.060
Promotion	0.012					0.036
Social Influence	0.000					0.057
Use Intention						

Figure 6a: F-Square

f Square

	Perceived Compatibility	Perceived Security	Perceived Usefulness
Attitude			
Ease of Use			0.033
Facilitating Conditions			
Perceived Compatibility			
Perceived Security			
Perceived Usefulness			
Promotion			
Social Influence			
Use Intention			

Figure 6b: F-Square

Hypothesis Testing

For the proposed paths and to verify the posited hypothesis, the following table was generated using SmartPLS v3.0. To create normalization of the data, Bootstrapping method with 5000 samples was designed from which t-statistics and p-values were generated as shown in the table 3 below.

The ‘t’ value when greater than 1.65 is significant with 90 percent significance level and when greater than 1.96 is significant with 95 percent confidence level.

Table 3: Path Significance

Paths	T-Statistics	P-value
Attitude → Use Intention	3.221	0.001**
Ease of Use → Attitude	0.054	0.957
Ease of Use → Perceived Usefulness	1.527	0.127
Ease of Use → Use Intention	0.769	0.442
Facilitating Conditions → Attitude	4.608	0.000**
Facilitating Conditions → Use Intention	0.869	0.385
Perceived Compatibility → Attitude	2.039	0.041**
Perceived Compatibility → Use Intention	0.508	0.611
Perceived Security → Attitude	1.276	0.202
Perceived Security → Use Intention	2.009	0.045**
Perceived Usefulness → Attitude	0.940	0.347
Perceived Usefulness → Use Intention	2.251	0.024**
Promotion → Attitude	0.927	0.354
Promotion → Use Intention	1.816	0.069*
Social Influence → Attitude	0.076	0.940
Social Influence → Use Intention	1.950	0.051*
*’ statistically significant with 90 percent confidence		
**’ statistically significant with 95 percent confidence		

(Source: Table generated with SmartPLS v3.0)

Conclusion

From the study and the statistical analysis, following conclusions are drawn:

- The suggested model is statistically valid and reliable with no multicollinearity present between the constructs.
- The antecedents were able to predict 22.7% of the variation in use intention and 22.5% of the variance in attitude towards the mobile wallet.
- With the f-square statistics it was observed that all the antecedent construct suggested in the model did contribute to attitude and use intentions.
- It is observed that attitude towards the mobile wallet is influenced significantly by facilitating conditions and perceived compatibility.
- Use intention is significantly influenced by attitude towards the mobile wallet, perceived security, and perceived usefulness.
- Promotion and Social influence have an influence on the use intention of mobile wallet.

Discussion

The study revealed that attitude towards the mobile wallet use influences the use intention of the mobile wallet. As the consumers have now become aware of the mobile wallets, the perceived usefulness of the mobile wallets leads to a use intention of the mobile wallet. The attitude towards the mobile wallet is significantly influenced by the perceived compatibility and facilitating conditions. The availability of a suitable mobile phone to use mobile wallet along with presence of vendors to accept mobile wallet positively influences the attitude towards the mobile phones.

The consumers also want to use the mobile wallet in places like restaurants, café etc. The model proposed in the study seems to be able to predict around 22% variance in the use intention and attitude towards the mobile wallets. Hence, can justify the factors listed in predicting the intention to use mobile wallet by the sample.

Thus, it emphasizes that companies providing mobile wallet services should create better facilitating conditions by providing adequate infrastructure, more vendors for using mobile wallets etc. The companies also need to address the security concerns of the customer like providing enough safeguards against consumer information and payment details. These steps could lead to a greater usage of the mobile wallets in the future among the youths.

The findings of the study are in line with the findings of major studies like, Venkatesh et al. (2003), Aydin (2016), Patel (2016).

Limitations

One of the limitations of this study was the small number of samples (119 samples only) and restricted only to the young (19-22 yrs.) college going mobile wallet users of Guwahati city. The restriction was there because of the time and resource constraint. There is definite scope for further research with a large sample inclusive of all age groups and in different parts of the country.

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