Understanding technology readiness and user's perceived satisfaction with mobile wallets services in India

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Abstract

This study used the UTAUT model to measure consumers' intention and perceived satisfaction towards the usage of mobile wallet. Given the rising importance of mobile wallet services, the significance of influential factors of their adoption including ease of use, trust, usefulness, attitude, social norms, perceived risk and, innovativeness need to be explored while assessing consumer perceived satisfaction with the mobile wallet. Our study also tested the moderating effect of innovativeness, social norms and perceived risk on a few constructs. Usefulness and innovativeness were found as most crucial factors to predict consumers' intention. We have also found that, the moderating effect of innovativeness and social norms were most significant in predicting consumers' intention. This study tested the UTAUT model in the Indian context.

Keywords: *Mobile Wallet, Intention, Satisfaction, Gap, Innovativeness, Stress.*

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1. Introduction

Advanced wireless technology has fuelled unprecedented growth in the mobile industry (Weber, 2007). Features like 'innovative' technology, high-speed connectivity and unique design systems have empowered mobile devices to send real time information to the users and offer opportunity to companies wishing to penetrate the untapped market (Singh et. al. 2016). Mobile penetration has emerged as a harbinger of major social change (Verma & Sinha, 2018). Another major development is the pace of growth of mobile commerce. The mobile wallet is the engine of mobile commerce.

Since its beginning, mobile wallets proved its capability to supplement the conventional way of making payments in the society. India, being a heavily populated and emerging economy with increasing penetration of smartphones, has a lot of scope for mobile wallets' penetration. People have started trusting and accepting online mode of payments services which has brought technological and social change in the country (Holahan et. al 2012; Baidya, 2016). Adoption of any innovative and new technology is dynamic and depends on several factors like lack of other convenient and user-friendly payment systems in the society (Slade et al., 2013; Su et. al., 2017). Other factors, which have enhanced the growth and usage of mobile wallets in India include demonetisation of INR 500 and INR 1000 currency notes, government's vision of cashless and digital India, and promotion of financial inclusion policy. To promote digital India and financial inclusion, the government is creating awareness about new payment technologies like mobile wallets, and other online platforms, which are unique and innovative for consumers (Yang et al. 2015). The government is providing incentives on various mobile wallet apps such a BHIM, Bharat Bill Payment System (BBPS) including monetary and non-monetary rewards to the users (Singh, P.B., 2018). The government has reduced taxes up to INR 2,000 on various online transactions by the users (Sen, 2017). In addition, increasing complexity of young consumers' needs and growing need of innovative customer centric solutions have prompted the central bank of India (RBI) to direct companies and wallet issuers to provide reliable and secure wallets to the users. This is likely to enhance the acceptance of mobile wallets in the country. Data has confirmed this trend and showed 21% increase in wallet transactions in 2018 (Gupta K., 2018).

Mobile wallets appear as an effective solution for companies to provide mobile payments services to users (Su et. al., 2017). India has a high percentage of young population with an average age of 29 years. These youngsters are more spendthrift and prefer to do credit transactions. They are more innovative, value conscious and get easily attracted to uniquely designed apps, which saves time and provides several benefits in a single system. Therefore, they prefer online wallets and online banking for their banking needs (Bhasker, 2016). The main reason behind preferring online payment systems is an increase in awareness level, change in social status, lifestyle and most importantly, education status of consumers in urban India. Firms must think of technology, which is convenient, time saving, flexible and can easily handle the expectations of the consumers (Amoroso & Watanabe, 2012; Oliveria et.al. 2016). Despite all the efforts of government and firms, the number of mobile wallet service users have remained low in India. There are a few factors, which are the actual roadblocks to the use of mobile wallet services in India such as lack of innovativeness, internet connectivity, security vulnerability, usability, interoperability, flexibility, etc. Apart from these roadblocks, the problem also lies in the attitude, perceived stress and consumers' perceived risk (Moid & Alam, 2015; Shen, 2015). These variables have been studied to understand the perceptions of users with respect to adoption of a mobile wallet.

This study has been carried out with the specific objectives of understanding the perception and satisfaction with mobile wallets. We have reviewed extant literature to understand different factors, which may influence the usage of new technology and enhance customer satisfaction (Swilley, 2010; Riquelme & Rios, 2010; Abhishek & Hemchand, 2016; Singh & Srivastava, 2018). We have reviewed a few studies to understand the user's perception and perceived satisfaction with mobile wallet technology (Singh et.al, 2016, Madan & Yadav, 2016; Madan & Yadav, 2018). Dahlberg et al. (2008) recommended that companies must review the features of existing technology and must include new and innovative features to achieve customers' satisfaction. In most of the previous studies, customers' perceived satisfaction is measured on a specific feature rather than the overall quality dimension of a new technology (Slade et al., 2013). In India, we have found a huge gap between the user's expectation and actual service delivery (Selvakumar, 2015) Customer satisfaction is closely related with this gap; a higher gap means low usage and low perceived satisfaction level of customers. In this paper, the intent is to analyse factors that may enhance consumers' perceived satisfaction with the use of mobile wallet services. In particular, our research objectives are:

- To understand the factors predicting the customer's intention to use a mobile wallet.
- To understand the importance of factors like technology readiness (innovativeness and stress) in predicting consumers' intention to use a wallet.
- To understand the association between users' intention and perceived satisfaction with wallet services.

This study delivers a comprehensive analysis of multiple factors that may directly and indirectly influence the user's intention and perceived satisfaction to use mobile wallet technology. We developed a conceptual model by including eight elements viz. ease of use, usefulness, trust, perceived risk, attitude towards using mobile wallets, social norms, innovativeness and stress. These factors were used in various previous studies to evaluate consumers' perception and perceived satisfaction with mobile wallet services (Shaw, 2014). However, association between these dimensions can be further explored and more factors can be considered to measure the user's behavioural intention. From the research point of view, this study contributes to the existing literature on technology services by considering the relationships between several key constructs (i.e., ease of use, perceived usefulness, attitude, trust, risk, social norms and innovativeness) and their influence on intention and perceived satisfaction with mobile payment services in an emerging market (i.e., India). Mobile payment services are becoming very popular in emerging economies like India due to mobile-centric internet diffusion. In India, mobile services are growing exponentially with India's mobile phone customer base increasing by 0.14 percent to reach 1,183.68 million in Feb 2019 (TRAI, 2019). Data shows that India is the first country to offer mobile access internet services and third largest on smartphone users base. Mobile payment services have emerged not only as enablers of money transfer in emerging economies such as India, but also act as a catalyst for achieving financial inclusion of the base of the pyramid section of the society (Gupta, 2013; Chauhan, 2015). However, for m-money to succeed, users should accept the initiative wholeheartedly. Due to increase in digital transactions and promotion of cashless economy, the findings of the study help to identify key factors, which need to be analysed by researchers, marketers and designers to increase the usage and adoption of mobile wallet services.

After reviewing the existing literature on mobile payment services, we witnessed a significant influence of these variables on the user's behavioural intention in the context of developing and developed economies

(Lin et.al., 2007; Taylor, 2016). These studies are in line with our model, where UTAUT constructs are used to measure the user's intention and satisfaction. In addition, we have found several similar studies, where ease of use, usefulness and attitude are found most significant in the context of developed economies like USA, China, Russia, etc. (Diego & Hobjin, 2010; Wu et.al., 2017). This shows the generalizability of our findings in the context of other economies. The study will help firms and researchers in identifying crucial factors, which may affect users' intentions and acceptance behaviour towards the use of mobile wallet. This study will assist companies to create and design new apps based on the consumer's perception and provide direction to the future mobile wallet studies.

2. Review of Literature

According to the study by Economides & Jeziorski (2017) in Tanzania, it has been confirmed that the use of mobile money transactions has increased in the last few decades. They highlighted that users avoid the use of cash and money storage at home due to an increase in crime-related risk. Chung et al. (2008) in their study on digital technologies, found that new technologies services such as mobile payments are flexible with users' personalized services and make it possible for payment companies to upgrade their services based on consumers' perception. This may lead to a long-term causal effect on the performance of these firms and enhance their consumer base (Schilling, 2002; Lawless & Anderson, 1996; Michela, 2019). Dutta et al. (1999) in a similar study found that the success of new technology is based on the marketing and research capabilities of a technology or telecom firm. They suggested that if a firm is able to use its marketing tools and resources efficiently, which enhances its image among the users of a service, it eventually enhances the firm's profitability. Darr (2016) suggested that firms must educate users about the use of multiple technologies during their work and other daily activities. Vast literature is available to understand several challenges associated with the adoption and implementation of new technology; these studies confirmed that advancements in technology have transformed the way people work and reduce the efforts due to the continuous use of technology (Sudhir & Talukdar, 2015; Haveman, 2016; Briscoe & Gardner, 2017; Singh et al., 2020). Stratopoulos (2016) used two innovative technologies, namely, cloud computing and enterprise resource planning (ERP), and found their significance to gain competitive edge in an organization context; their findings revealed that effective implementation of these technologies bring greater flexibility and convenience in the process which eventually leads to competitive advantage to the firms. In developing countries like India, the benefit of technologies such as mobile payments are multi-fold; telecom companies and payment providers are putting tremendous efforts to understand users' needs and emerging as main providers of financial services on mobile platforms (Dale & Strioh, 1999; Diego & Hobjin, 2010). According to Shugan (2004), emerging technologies like mobile payment help reduce cost and efforts and hence, are preferred by users. Another study (Overby & Ransbotham, 2010) contributes to the extant literature by explaining the importance of mobile payment technology and its implications for telecom service providers, payment facilitators and society.

According to Sukhwal & Mathur (2017), increasing usage of online shopping and information search has made technology adoption very common among users. Consumers often use various disruptive technologies namely internet banking, mobile banking, mobile payments to make purchases, payments and other transactions (Kalyanaram, 2016; Mills et al, 2016; Stratopoulos, 2016). These technologies are considered time-saving, efficient, and convenient by users (Bhattacharya & Srivastava, 2018). This study shows that consumers are profiting

from and promoting the use of mobile payment services and their usefulness (Bhattacharya & Srivastava, 2018). Nowadays, users find mobile technology a multipurpose solution, which is satisfactory and easy to use. In a similar study based on distributed ledger technology (DLT), Mills et al (2016) found technology very useful to store, record and retain information of a user; they further confirmed that technology like DLT might help to promote digital India and financial inclusion by allowing technology firms to connect with end users directly without any interventions of financial intermediaries. However, despite these advantages, previous studies confirmed the low use of digital transactions by the users (Lal & Bharadwaj, 2014; Stratopoulos, 2016); these studies confirmed that consumers prefer physical access and cash payments to do various deals and transactions. There are several previous studies where challenges related to adoption of technologies are discussed in detail (Holahan, et al. 2012; Kumar & Kasuhal, 2017). A few such factors are low awareness, risk perception, users' attitude about technology; these studies confirmed that consumers perceive less or no value to go digital.

The literature review suggested that the studies on mobile payment systems has been fragmented. Previous research studies have primarily focused on consumers' intention related issues (Kumar & Kasuhal, 2017; Bhattacharya & Srivastava, 2018; Mulik et al., 2018). Other areas such as understanding satisfaction levels of the users and analysing the role of service providers still remained under-researched (Dahlberg et.al., 2015). This research is an attempt to bring new insights in technology adoption and customer advancements in technology have transformed perceived satisfaction with wallet services. The review of existing literature in the field of technology adoption explained that various studies have been advanced to investigate adoption behaviour of consumers (Yang et. al., 2012; Lal & Bharadwaj, 2014). Most of these studies used TAM (Dahlberg et. al. 2015) and integrated UTAUT model (Oliveria et. al. 2016) to measure variables like ease of use, usefulness, perceived risk, social norms, attitude, and trust on new technology usage and intention. Most of these studies have discussed mobile applications in general, and have not focused on mobile wallets in specific (Wu et.al., 2017). Dahlberg et.al. (2015) interviewed a group of consumers to determine factors, which are important for new technology adoption, and consumers' intention to use a technology. According to Holahan, et al. (2012), implementation of a technology brings greater compatibility and efficiency; their findings suggested perceived usefulness and ease of use are equally important to enhance employee acceptance in an organizational context. In the review of various existing technology models, it has been found that one model is not enough to explain the adoption behaviour. Against this backdrop, we found integrated UTAUT, the most suitable model as it includes all the relevant factors to examine consumers' behaviour in India. Shin (2009) used integrated UTAUT model, and other demographic factors to measure mobile wallet adoption among consumers. Their study found that security and perceived trust are the most significant factors to influence mobile wallet services (Madan & Yadav, 2016). Shaw (2014) used 'trust' as a mediating variable to determine its impact on consumers' perception. In the context of India, we found several studies discussing the use of UTAUT on various technologies. Mulik et al (2018) used UTAUT model to identify consumer acceptance and usage of MOOC services in India. Singh et al., (2016) found a very strong correlation between consumers' intention to use and perceived satisfaction level associated with the existing mobile wallet services. In a few studies, we have found that perceived risk and usefulness are the most crucial factors to influence new technology (Wu et.al., 2017). In various past studies, perceived risk has been investigated comprehensively on mobile payment services (Swilley, 2010; Reuver et. al., 2015;

Taylor, 2016). Swilley (2010) and Yang et. al., (2015) found that perceived security and perceived risk have a negative impact on the user's attitude with wallet services. In a related study, Lal & Bharadwaj (2014) found data risk and security threat as the most used construct to affect use of a technology like cloud computing. Furthermore, Sharma & Kurien (2017) revealed seven categories of risk associated with the use of online technology; their findings explained that performance and financial risk are most significant among e-users in India. All these studies indicate technology adoption in general, but a huge gap was highlighted between the consumer's expectations and actual performance of a new technology. This study is an attempt to fill the gap by analysing constructs of users' intention and its impact on users' perceived satisfaction with mobile wallet. This study will be relevant to find out the drivers of digital payment acceptance in an economy and to support a cashless economy.

2.1. Conceptual Background

There are various advanced models to determine adoption behaviour and drivers of new technology usage. The most popular model is TAM (technology acceptance model) provided by Davis (1989). TAM model uses various behavioural factors like ease of use, attitude, perceived usefulness to measure the user's intention (Shin, 2009; Slade et al., 2014). Researchers found that TAM model has a few limitations, as it has not included important factors like security of the system, consumers' trust and social norms to examine the user's behavioural intention (Kizgin et. al., 2018; Li et al., 2014; Venkatesh et. al., 2003). During the study, we have found that the major challenge to promote mobile payment system is low awareness among consumers about digital economy or cashless transactions in India. This may result in low trust, high social and technical resistance to use a technology (Yang et.al. 2012; Upadhyay & Chattopadhyay, 2014; Dahlberg et. al., 2015). Factors like perceived security, consumers' stress, cost of the services, infrastructural issues and technology readiness are among the few variables which affect consumers' perception; these are not considered in the TAM model (Li et al., 2014; Apanasevic et. al., 2016; Taylor, 2016; Kizgin et. al., 2018). Customers have a busy life and find self-service systems more comfortable. They prefer technology, which is less time consuming, easily accessible, and provides high-speed transactions facilities (Thakur & Srivastava, 2014). On the other hand, 68% of the Indian population still live in rural areas (worldbank.org) and they lack the basic amenities. Hence, the usage of technology is very low in these areas. The primary reason for this backwardness is high illiteracy, low technology readiness and poor infrastructure facility (Kaur, 2013). Low technology readiness among the users can increase the gap between consumers' expectations and satisfaction with wallet services (Weber, 2007). This gap can be reduced with awareness, information and innovation. Technology-readiness is widely used in the literature and influences consumers' intention to use a technology substantially (Lin et., al. 2007; Oliveira et. al. 2016). Tsikritis (2004) used a four-dimensional model to study technology readiness by including optimism, innovativeness, discomfort and insecurity among the consumers. We also felt the need to study technology readiness and included two factors - innovativeness and stress - to measure technology readiness among Indian consumers. After reviewing the limitations of TAM model, this study considered ease of use, innovativeness, attitude, usefulness, trust, perceived risk, social norms, stress to examine consumers' intention and perceived satisfaction.

2.2. Framework of the Study and Hypotheses development (model)

Conceptual model is proposed in Figure 1. We propose to have a direct relationship of all the eight variables on the user's intention and perceived satisfaction. Our

study used three moderating variables including social norms, innovativeness and perceived risk to test their influences on other variables viz. attitude, perceived risk and trust. The efficacy of this model was determined by the impact of the selected variables on consumers' intention and perceived satisfaction.

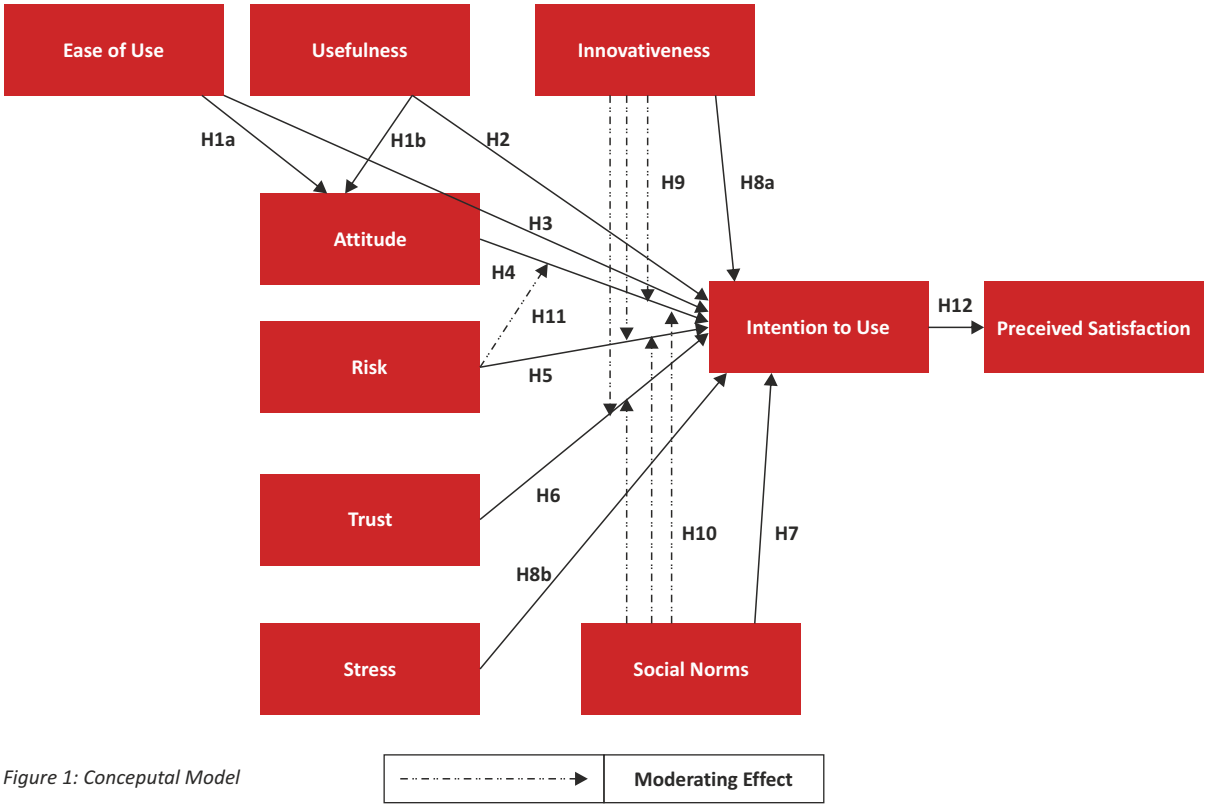

Figure 1: Conceptual Model

2.2.1 Various factors influencing technology acceptance:

UTAUT model includes factors such as ease of use, security, usefulness, trust, price value, habit and social norms. These variables have been used in various studies to find out the impact on new technology. Venkatesh et. al., (2003) used UTAUT model and found a strong influence of various determinants on consumers' attitude to use a new technology. UTAUT model suggested that attitude defines a person's intention to perform a task or adopt a system (Slade et al., 2014; Dwivedi et al., 2017b). Shin & Kim (2008) suggested a positive association between attitude and intention to use a technology. Cheol & Hwang (2002) stated that security is the most important barrier in technology adoption and affects consumers' intention to use a technology (Dahlberg et. al., 2015; Taylor, 2016). They found convenience and usefulness have a significant effect on a new technology service. Oliveira et. al. (2016) also found social norms to be important to understand the adoption behaviour in mobile payments industry (Apanasevic et. al. 2016; Cabanillas et. al., 2017a). Based on the previous studies, our model hypothesized a significant influence of all these variables on users' behavioural intention and perceived satisfaction (Thakur & Srivastava, 2014; Duarte et. al., 2018). We confirmed the applicability of these chosen factors to determine consumers' intention. These associations are already confirmed in the literature review of similar studies and the validity of the model is established in the previous studies (Shaw, 2014; Apanasevic et. al., 2016).

H1: Ease of use and usefulness has a significant impact on users' attitude with mobile wallet

H2: Ease of use positively influences intention to use various mobile wallet services

H3: Usefulness has a positive impact on intention to use various mobile wallet services

H4: Attitude towards a mobile wallet has a positive influence on intention to use various mobile wallet services

H5: Perceived risk positively influences the intention to use various mobile wallet services

H6: Trust positively influences the intention to use various mobile wallet services

H7: Social norms have a positive impact on intention to use various mobile wallet services

2.2.2 Innovativeness and Stress in Technology Adoption

Technology readiness is defined as a state of mind and a person's character to identify the enablers and inhibitors in the adoption of a new technology. A strong positive correlation between technology readiness and consumers' intention behaviour is found in the literature (Tsikritis, 2004; Lin et. al. (2007). Tsikritis (2004) developed a four-dimensional model to study technology readiness of a consumer. These factors are optimism, innovativeness, discomfort and insecurity. These factors may motivate or inhibit consumers about a technology (Dahlberg et. al, 2015). In our study, we have considered two aspects of technology readiness, which are innovativeness and stress. Innovativeness is measured as an individual's belief to use a new technology service and feel confident about it. On the other hand, Stress is measured on the level of distrust and discomfort, an individual's feeling in using a technology. Both the aspects may have a positive or negative influence on the intention and perceived satisfaction level of consumers (Yang et. al., 2012; Oliveria et. al. 2016; Taylor, 2016; Cabanillas et al., 2017b). Westjone et. al. (2009) stated that innovativeness in a user influences his technology usage positively and the user's stress affects adoption adversely. We supported the available past studies, and proposed the following hypotheses:

H8a: Innovativeness influences intention to use various mobile wallet services significantly.

H8b: Stress influences intention to use various mobile wallet services significantly.

2.2.3 Effect of Moderating variables:

Moderators are also known as the control variables that influence the association between two different factors (Shin, 2009). Gender, age and income have established their importance as moderators in various past studies (Cabanillas & Rubio, 2017; Madav & Yadav, 2018). Venkatesh et. al. (2003) found that age moderates technology adoption behaviour of a consumer. Income is also considered as a vital moderating factor in various technology adoption studies to observe the user's behaviour. Lal & Bharadwaj (2014) used gender as a moderator to examine its influence on consumers' attitude towards a new technology. They found that males are more vigorous in using new technology than females. In several studies, trust is also used as a moderator to describe consumers' intention to use (Westjone et. al., 2009). Previous studies explained that low trust means less use of technology by the consumers. Hence, it might moderate the linkage between users' intention and actual usage of a technology. We argued that innovativeness might have a moderating impact on intention of a consumer. Some of the studies have also used social norms to moderate perceived trust and behavioural intention of consumers towards using a new technology (Lin et. al., 2007; Shaw, 2014; Madav & Yadav, 2018). Very limited evidence is available in the literature, where effective use of moderator has been discussed specifically on mobile wallets (Shin, 2009; Shaw, 2014). We extended our research by including three moderating variables - innovativeness, social norms and perceived risk - to test their influence on a few determinants of technology adoption.

H9: Innovativeness moderates the relationship of trust, attitude and perceived risk with user intention.
H10: Social norms moderates the relationship of trust, attitude and perceived risk with user intention.
H11: Perceived risk moderates the relationship of attitude with user intention.

2.2.4. Consumers' perceived satisfaction with mobile wallet services

Satisfaction is a crucial construct in mobile payment systems. Various previous studies have found that it cannot be measured directly and is mostly used as an influencing variable (Sukhwal & Mathur, 2017). Consumers' perceived satisfaction is positively connected with intentions to use a technology service (Reuver et. al., 2015; Cabanillas et. al., 2017b). Consumers' perceived satisfaction is built based on their pre-usage of a technology and actual values received from the service. When users are satisfied with the services of mobile wallet technology in terms of flexibility, time-saving automatic systems, high convenience, trusted apps and high functionality, they adopt it for their banking services (Oliveria et. al. 2016; Madav & Yadav, 2018). Very few studies have used users' perceived satisfaction as a post adoption construct and analysed its relationship with users' intention. Jun et. al., (2004) determined the positive association between users' perception and perceived satisfaction with the payment technology services. Consumers' satisfaction is generally affected by the perceived value and benefits of a technology, which means superior quality and experience of a service may enhance the user's perceived satisfaction (Selvakumar, 2015; Cabanillas et. al., 2015b). Hsu et. al., (2010) found that when the user is happy and feels satisfied with the technology features, he is more willing to use it. Perceived security and trust on the system also play an important role to study consumers' perceived satisfaction and establish a strong connection with intention (Lawless & Anderson, 1996). We tried to find out the influence of the user's intention on his perceived satisfaction by proposing the following hypothesis:

H12: User's intention has a positive impact on the perceived satisfaction with the mobile wallet.

3. Research Methodology

For this survey, final data was collected manually and monitored online. 300 questionnaires were distributed to understand users' perception on the use of a new technology. We received responses from more than 230 consumers and selected data from 206 responses, for the present research work. Rest of the forms were rejected due to incomplete information. Current population of Delhi/NCR is 4.61 crore which is considered as the entire population. Sample size was calculated by using sample size tool (https://www.surveysystem.com/sscalc.htm) with confidence level of 95 percent and confidence interval of 6.88 percent, which came out to be 196. Our sample size is above this minimum. The most important reason behind selecting young consumers in the study is that they are the initial adopters of new technology, including mobile payments, as compared to consumers in the older age groups. Recently, a survey conducted on Indian consumers on the use of mobile payment apps showed that 33 percent of the respondents aged 27 to 37 years used mobile apps for their shopping payments (Statista, 2018). Table 1 describes the demographics characteristics of the participative respondents.

For this study, convenience sampling method was used, which means personal contacts of the researchers and their networks were invited to take part in the manual research as well as online survey method. The reason for choosing a small but known sample of respondents was that a recipient of survey invitation responds positively to a known contact rather than to unknown persons. This was the main reason for choosing a small sample size for the

research. Additionally, the sample respondents belonged to Delhi/NCR region, which attracts youngsters from all over India and represents all four sections of the country (Statista, 2018). However, to reduce the effect of cultural and economic differences, the sample was confined to one country. Therefore, the selected sample was found appropriate for the study. Descriptive statistics, Reliability and Validity check, and Regression with or without moderating effect were used for the study. All the constructs and their items loadings, Eigen values and their Cronbach's alpha values are mentioned in Appendix I.

Table I: Descriptive characteristics

Demographics		Frequency	Percentage
Gender	Males	113	0.55
	Females	93	0.45
Age	20 years – 30 years	116	0.56
	31 years - 40 years	48	0.23
	41 years – 50 years	16	0.08
	Above 50 years	26	0.13
Household Monthly Income (INR)	10,000 or less	55	0.27
	11,000 to 50,000	19	0.09
	51,000 to 150,000	13	0.06
	151,000 to 300,000	26	0.13
	301,000 to 500,000	66	0.32
	More than 501,000	27	0.13
Occupation	Employed-public sector	65	0.32
	Employed-private sector	30	0.15
	Business	25	0.12
	Students	74	0.36
	Others	12	0.06
Do you currently use Mobile wallet services?	Yes	192	0.93
	No	14	0.07
How often do you use mobile wallets?	more frequently	59	0.29
	once a week	89	0.43
	once a fortnight	26	0.13
	once a month	32	0.16

4. Data Analysis and Results

4.1: Model testing and relationship among the variables

Table II describes the composite reliability (CRC), correlations, average variance extracted (AVE) and measures the discriminant validity among the chosen variables. Composite reliability values were greater than 0.70 except for two factors (Straub, 1989). Square root of Average Variance Extracted for each factor is better than correlation coefficients between the constructs (See Table II) (Hair et. al., 2014). In conclusion, factors showed good reliability and validity. Table III summarised the regression result of various factors on user's intention and perceived satisfaction. The effect of constructs, ease of use and usefulness on individual attitude is significant. Our results supported the first hypothesis and showed that both the factors influence the user's attitude towards mobile wallet services. The results explained that except for ease of use, trust and attitude, all the other variables had significant influence. Our findings imply that innovative and convenient wallet services have high consumers' response and they show more intent to use it for their banking services (Madan & Yadav, 2016). Overby & Ransbotham (2010) confirmed the negative association of perceived risk and stress on intention to use technology services. Consumers are more cautious about the risk factors. If they feel stressed in using a wallet service or consider it risky, they prefer lower use of mobile wallets. We also found the positive and significant influence of the user's intention on his perceived satisfaction. Users' satisfaction is derived by behavioural intentions and attitudes. Xu & Du, (2018) used perceived satisfaction as an external variable to influence intention and found its significant impact on users' attitude. These results supported the findings of previous studies, which state that if technology is easy to use, innovative, trustworthy and socially accepted, the consumer feels more satisfied and intends to use the technology (Yang et. al., 2012; Dahlberg et.al., 2015; Cabanillas et al., 2017c). These results accepted H1, H3, H5, H7, H8a and H8b, H12 hypotheses and rejected H2, H4, H6 hypotheses.

Table II: Reliability and Discriminant Validity

SN	Variables	CR	AVE	1	2	3	4	5	6	7	8	9	10
1	EU	0.854	0.595	**.77**									
2	UF	0.843	0.642	.81***	**.80**								
3	RI	0.713	0.453	.59***	.62***	**.67**							
4	TRU	0.733	0.410	.43***	.45***	.51***	**.64**						
5	ATT	0.713	0.387	.76***	.73***	.598***	.46***	**.62**					
6	SN	0.633	0.377	.31***	.32***	.36***	.27***	.50***	**.61**				
7	INOV	0.824	0.542	.28***	.23***	0.13	0.06	.35***	.29***	**.73**			
8	STR	0.670	0.405	-.27***	-.16***	-0.11	-0.06	-.22***	-0.11	-0.1	**.63**		
9	INT	0.824	0.611	0.11	.19***	0.05	0.05	.18***	.25***	.32***	.14**	**.78**	
10	SATF	0.710	0.451	0.11	0.12	0.33***	0.45***	0.25***	0.45***	0.54***	0.07	**0.46****	**.67**

*Source: Authors' Survey, N=206; *** p < 0.01, ** p<0.05, * p<0.10*

Table III: Regression Analysis among the variables

Variables	Standardised Regression Coeff.
EU->ATT	.40***
UF->ATT	.28***
EU->INT	-.11
UF->INT	.31***
RI->INT	-.15*
TRU->INT	-.004
ATT->INT	-.014
SN->INT	.20***
INOV->INT	.22***
STR->INT	-.18***
INT->SATF	.445***
R^2	.20
Adj. R^2	.17
Sig. F Change	.000

Source: Authors' Survey
*N=206; *** p < 0.01, ** p<0.05, * p<0.10*

4.3 The Moderating effect

In order to determine the moderating effect of variables viz. innovativeness, social norms and perceived risk on consumers' intention, we conducted the moderation analysis by using a multi-group analysis. The method includes a modified Student's t test for independent samples to compare standardised regression weights between structural models measured in pairs (Lee et. al., 2000). The results are detailed in Table IV. Results confirmed the moderating effect of innovativeness on the influence of trust and perceived risk on intention to use whereas no moderating effect of innovativeness was observed on attitude. The explanation is that, with lower level of innovation, the user shows lower intensity in the relationship between trust and intention (β = 0.518; p<0.05) than with a higher level of innovation (β = 0.682; p<0.05). Moreover, a user with low level of innovation shows higher intensity in the link between perceived risk and intention (β = 0.799; p<0.05) than a user with high level of innovation (β = 0.677; p<0.05). There is no significant difference found between high and low level of innovation on the influence of attitude on the user's intention. This partially accepts our hypothesis H9. The results support past studies on technology (Liébana-Cabanillas et al.2018).

In the second step, we analysed the moderating effect of social norms on users' intention to use (H10). In this case, the study found significant differences between users with a higher level of social influence and users with a lower level of social influence. This means that, with greater social norms, the influence of trust is more (β = 0.801; p<0.05), but influence of perceived risk is less (β = 0.576; p<0.05) on users' intention to use than users with lower social norms (Sharma & Kurien, 2017). We have found no moderating effect of social influence on users' attitude, which partially accepts our hypothesis H10. Finally, the level of perceived risk does not moderate the influence of attitude on users' intention, which rejects our hypothesis H11.

Table IV: Results for Moderating Effects with multigroup analysis*

Effect	INOV LOW (n=101)			INOV HIGH (n=105)			t-Student	Differences
	Estimates	Error	P value	Estimates	Error	P value		
H9: TRU->INT	0.518	0.046	.000	0.682	0.068	.000	-3.273	YES
ATT->INT	0.852	0.030	.000	0.853	0.041	.000	-0.035	NO
RI->INT	0.799	0.060	.000	0.677	0.039	.000	2.71	YES
	SN LOW (N= 102)			SN HIGH (N=10)			t-Student	Differences
	Estimates	Error	P value	Estimates	Error	P value		
H10: TRU->INT	0.677	0.054	.000	0.801	0.045	.000	-4.15	YES
ATT->INT	0.852	0.030	.000	0.856	0.037	.000	-0.18	NO
RI->INT	0.813	0.045	.000	0.576	0.072	.000	4.21	YES
	RI LOW (N= 92)			RI HIGH (N= 114)			t-Student	Differences
	Estimates	Error	P value	Estimates	Error	P value		
H11: ATT->INT	0.861	0.025	.000	0.848	0.041	.000	0.399	NO

Source: Authors' Survey, N=206

*The following formula was used to perform mutli-group analysis: Ho: B1 = B2

$$t = \frac{B_1 - B_2}{\sqrt{SE_1^2 + SE_2^2}}$$

where Bi denotes path weights and SEi is the standard error of the path in the structural model.

5. Discussion and Conclusion

This study reviews the user's behaviour and determines various factors influencing the user's intention and perceived satisfaction with a new technology. Most of the variables were found significant to determine consumers' intention and perceived satisfaction with a new technology (Reuver et. al., 2015; Oliveria et.al. 2016). The study suggested that usefulness and innovativeness are the most important elements to influence users' perceived satisfaction (Yang et. al. 2012). Wallet services are perceived unique and new by the consumers. App designs are innovative and eliminate the physical efforts of doing banking transactions; hence, they are preferred by consumers (Lin et.al., 2007; Shin, 2009). Usability of the services was another factor that directly influences consumers' intention. The consumer believes that his life and work become easy by using wallet services for daily banking activities (Oliveria et.al. 2016).

Conversely, results showed that stress has a negative effect on intention to use various mobile wallet services (Lin et. al., 2007, Dahlberg et. al. 2008). The explanation is that the consumer believes that mobile wallets is an advanced technology which is complex in nature and difficult to use. Hence, it can develop stress and anxiety in the consumer while making any transactions through a mobile wallet (Swilley, 2010; Wu et. al. 2017). The consumer may feel discomfort in making payments through online wallet services. We found a negative impact of perceived risk on the user's intent (Wu et.al., 2017). The results also revealed that the user's intention had a positive influence on his perceived satisfaction with the wallet services (Dwivedi et al., 2017a,b). The results were consistent with various previous research studies in the same field (Bae & Cha, 2015; Xu & Du, 2018). These studies confirmed that the user's perceived satisfaction improves by his willingness to use mobile wallet services continually. According to Moid & Alam (2015),

when service quality goes beyond expectations, the user feels satisfied and willing to use a new service.

For further research in the subject area, the study dealt with the moderating effect of innovativeness, social norms and perceived risk on consumer intention to use wallet services. This study confirmed the significance of variables like trust and perceived risk and found them essential for the social breakthrough of mobile payment systems (Thakur & Srivastava, 2014; Apanasevic et.al. 2016). We determined that trust and perceived risk perception of a consumer can be improved by social influence and innovativeness of the wallet system (Dwivedi et al., 2017a,b).

The results revealed that a high level of innovativeness and social norms strengthened the influence of trust and had a positive impact on users' intention to use a mobile wallet. Users with high innovativeness and high social norms showed more trust and were more inclined to use mobile wallet services. This positive association may be due to users' need for innovation and time saving technology. The results suggested that regardless of the usefulness and convenience of the system, if users do not find wallet innovative and unique, they may not trust the app and may not be keen to use new wallet services (Agarwal & Prasad, 1998). Moreover, the results confirmed the users' propensity to be influenced by social norms, and the decision of their friends and family to use mobile wallets (Oliveria et al. 2016). Liébana-Cabanillas et al. (2018) explained that users trust a new technology and use it, if their known references share positive feedback about it and recommend it. Various previous studies confirmed these links and explained the influence of innovativeness and social norms on users' trust, which eventually affect users' intention to use (Lin et.al., 2007; Yang et al. 2015; Cabanillas et al., 2017c).

Another important insight of the study is the moderating effect of innovativeness and social norms on users' risk perception, which get strengthened. The study found a negative association between perceived risk and intention; however, if users perceive technology to be innovative and receive positive recommendations from their known social references, their risk perception changes and they show more inclination to use a technology. In various previous studies, perceived risk and its impact on consumer intention has been discussed in detail; these studies suggested that perceived risk of a user can be improved by using useful, innovative and convenient services (Swilley, 2010; Reuver et. al., 2015; Apanasevic et. al. 2016; Madan & Yadav, 2016). There are studies, which highlighted the relevance of social influence and personal word of mouth to improve the risk perception of a user and enhance the adoption of a technology (Agarwal & Prasad, 1998; Taylor, 2016; Sukhwal & Mathur, 2017). Interestingly, we have not found moderating effects on the influence of users' attitude on intention. This may be due to the impact of some behavioural factors namely: resistance to change, habit of using cash, low awareness level, which impact users' attitude immensely and do not get influenced with various technology related factors (Amoroso & Watanabe, 2012; Oliveira et. al. 2016). Overall, all the moderating variables used have enhanced the results of measuring consumers' intention behaviour. These findings established a new and expanded theoretical development of the UTAUT model. Considering the huge potential of mobile wallets, this study will help researchers as well as marketers to understand the conceptual model and determine the significance of constructs of mobile wallet adoption.

5.1 Implications

In India, mobile phones' revolution and improvement in digital networks have transformed financial system scenarios. Mobile payment systems are further

stimulating financial inclusion initiatives by facilitating rural people into the financial mainstream. To push the digital India initiative and financial inclusion policy, the government is promoting various digital payment modes and incentivising apps such as BHIM, Bharat Bill Payment System (BBPS) with cashbacks and reward points to the users (Singh, P.B., 2018). Data shows that the transactions value of mobile wallets was up by 21% in 2018. The main reason for growth is cashbacks on using digital transaction mode like use of debit and credit cards by the customers. To leverage the growth further, Reserve Bank of India (RBI) has directed all the mobile wallet issuers to provide convenient, operational and secure wallet services to the users. This is likely to increase the use of mobile wallet transactions in India (Gupta K., 2018). In spite of the growing importance and popularity of wallet services globally and in India, users' intention and perceived satisfaction are not carefully assessed in the literature and no single framework has been designed on these crucial factors. To academicians, this study has validated the established theories and created a comprehensive model, confirming its robustness in predicting wallet users' intention and perceived satisfaction with mobile wallet services (Thakur & Srivastava, 2014; Shaw, 2014; Madan & Yadav, 2016; Singh & Srivastava, 2018, Singh et al., 2020). As noted in the past studies, users' perceived satisfaction, perceived stress and innovativeness have received greater attention, but rarely used in various theories like TAM, UTAUT to study adoption behaviour of mobile wallet services (Oliveria et.al. 2016). For researchers, this study offers a basis for additional improvement in users' model of technology acceptance. Inclusion of constructs like perceived satisfaction, innovativeness and stress proved to be most appropriate and validated the behavioural effect (Shaw, 2014).

For practitioners, this study will help to identify the crucial construct to design and use mobile wallet services and functionality to attain high user acceptance and perceived satisfaction. Deep understanding of the study might help companies and government to identify factors recommending wallet services. The results validate the significance of determinants such as ease of use, usefulness, attitude and innovativeness on users' intention, which eventually influence perceived satisfaction with the services. In this sense, managers and designers must create awareness about the usefulness and ease of use benefits of wallet services among the users. In order to satisfy customers with the use of mobile wallet services, developers must emphasize on such benefits. The study reveals that innovative technology and unique app design satisfies existing consumers most (Lin et. al., 2007). These results suggest that if wallet is innovative, new and trendy in design, consumers prefer it more. In addition, the study highlights the importance of consumers' stress and anxiety while using wallet services. The government must issue guidelines to companies for initiating strategies to handle perceived risk and stress of a consumer, which may affect his intention to use mobile wallet technology. Mobile vendors and marketing managers of mobile companies may resolve these resistances by ensuring that their services are based on consumers' expectations namely, their wallet services are innovative, easy to handle in operations and safe to save personal and bank data of the consumer. In conclusion, understanding the dynamic nature of mobile technology system, this study gives important insights about the factors, which may influence consumers' intention to use various mobile wallet services. Researchers can draw implications from this study and can use the model to understand the behaviour of customers on mobile wallet services. Practitioners can use the study to enhance users' acceptance and increase popularity of mobile wallets in the market.

5.2 Limitations of the research and future scope

This study contains a few limitations. First, our group of respondents symbolizes a small group of the Indian population. We suggest including a large and varied cultural, social and demographic group to make future studies more generalized. With respect to research methodology and data collection process, our study conducted a cross-sectional survey of a group of respondents. Future studies may conduct a longitudinal study to analyse the evolution of users' perception and acceptance of technology with time. Moreover, research can further extend to different countries due to varied facilities and infrastructural availability. Third, the study measured the behavioural intention of users of mobile wallet technology; we further recommend comparing the behaviour of users and non-users of wallets to review the determinants of technology acceptance. To increase the robustness of the research, future studies may also compare the pre and post-adoption perception of a user with time, which eventually leads to the actual usage of a service. In addition, future studies may review the change in the user's intention in detail and include other variables like continued intention, actual usage, and recommendations to other users on social platforms. The role of electronic and personal word of mouth may also be discussed in detail as nowadays, users continuously share their views or feelings about technology or service on various social media platforms and public mediums.

Finally, with changing complexities and expectations of users' behaviour, we suggest the inclusion of a few relevant variables that allow us to better understand the user's intention and perceived satisfaction with mobile wallet services. In this regard, we recommend a review of motivating (hedonic and utilitarian) and inhibiting variables (anxiety, emotions, etc.) of the user's perception. Future studies may also discuss the role of other personal and psychological dimensions such as perceived enjoyment, loyalty, perceived value and a few technical dimensions such as facilitating conditions, cost, and service quality to understand the influence on the acceptance and usage of mobile wallet services.

5.3. Applicability and Generalizability

This study includes a sample from Delhi NCR (National Capital Region) in India, which is considered one of the biggest technological hubs providing various technology services. NCR region represents the world's largest urban agglomeration, which attracts people from all over India belonging to varied cultural, social, educational and religious backgrounds (Statista, 2018). In addition, respondents represent gender and age strata along with occupation, income, and usage pattern, coming from users representing pan-India. Hence, the current sample may be considered as representative of the Indian population. It is relevant to add that more than 50 percent of the sample forms part of the 20-30 years of age category. The rationale behind choosing a young population is that they are the early adopters of new technology including mobile payments as compared to older age groups. Data shows that around 33 percent of mobile payment users in India are aged between 27-37 years (Madan & Yadav, 2016). Hence, the study finds the current sample most appropriate to understand the determinants of behavioural intentions.

Moreover, mobile payment services act as a multipurpose solution to various sectors such as e-commerce, mobile banking, etc. which are growing in double digits every year in India. The use of such payment services is a revolution and offers new opportunities to banks and non-banking firms to reach a large population of unbanked customers in India. This new technology is making a significant impact on existing and new customers to adopt mobile payment services for convenience after demonetization and emphasis on financial inclusion (Sen, 2017). As India

and other economies are moving towards the cashless environment, these services need to be customized and reviewed further in order to enhance acceptance and behavioural intention to use mobile payment system (Mulik et. al., 2018).

Adoption of mobile payment services has begun but is still not at full scale, which is required for the complete adoption of wallet services in India and other developing economies like China, Malaysia, Korea, etc. (Lin et. al. 2007; Cui et al., 2009; Shaw, 2014). This study shows that ease of use and usefulness influence users' attitude positively. In this regard, developers of applications must include and promote ease of use and user-friendly benefits of the wallet services to enhance users' attitude and perception. Moreover, other factors like trust, innovativeness and attitude affect users' intention and perceived satisfaction directly as well as indirectly. In order to attract more customers in the end, application developers must highlight such benefits, so that the user is perceived satisfied with the use of mobile wallet services and enhance their usage.

Finally, the results of our findings are similar to other studies on mobile payment services in various developed and developing economies like Russia, USA, Europe, China, Malaysia, Japan, etc. (Cui et al, 2009; Amoroso & Watanabe, 2012; Cabanillas & Rubio, 2017; Dwivedi et al 2017a,b). These studies used UTAUT variables like our study and validated their associations with the user's intention to use mobile payment services. Hence, the results of this study can be applicable to other economies on technology adoption.

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Appendix I

Construct and Items	FL range	EV	Sources
Factor 1: Ease of Use (EU) Mobile wallets are compatible to solve users' problems. I am acquainted with the mobile wallet technology. I am familiar with the operation of the mobile wallet services. Through mobile wallet, I can access all wallet transactions easily.	0.66--0.94	3.083 (.899)***	**Integrated UTAUT Model (Shin, 2009)**
Factor 2: Usefulness (UF) Mobile wallet functions are very helpful for my work. Work becomes easier after using mobile wallets. Mobile wallet is really useful in my daily life	0.65-.085	2.401 (.899)***	
Factor 3: Risk (RI) I have a fear of disconnection during mobile transaction. My personal and financial information is secure in mobile wallet. I believe my personal information is not being exposed to unauthorized third parties.	0.64-0.79	2.019 (.887)***	
Factor 4: Trust (TRU) I trust that my personal information is safe in wallets. I trust that the app is protected from virus. I trust that mobile wallet contains all my bank information accurately. I trust my debit and credit card will not be misused in mobile wallets.	0.50- 0.78	2.54 (.746)***	
Factor 5: Attitude (ATT) Use of mobile wallet is a new and unique idea. Mobile wallet is beneficial in every sense. Mobile wallet is the need of the current changing world. Use of mobile wallet services is really exciting.	0.50-0.93	2.46 (.791)***	
Factor 6: Social Norms (SN) My family thinks that mobile wallet should be used. My friends think that mobile wallet is a good idea and I should use it. All important people in my life use mobile wallets.	0.52-0.78	1.79 (.831)***	
Factor 7: Innovativeness (INOV) I use mobile wallet because it's a new technology. I like to try new things, that's why I use mobile wallet. App is very innovative in design and use. I believe mobile wallet is a new idea.	0.67-0.85	2.93 (.867)***	Lin et.al., (2007)
Factor 7: Stress (STR) Mobile wallet is a complex tool and I feel pressurized to use it. It's so difficult to handle mobile wallets accurately. It's not safe at all to use mobile wallets for banking transactions.	0.56-0.70	1.90 (.789)***	Dahlberg et.al (2008);
Intention (INT) I always intend to use mobile wallet in the future. I will try to use mobile wallet service in my daily life. I propose to use mobile wallet regularly.	0.61-0.82	2.33 (.776)***	Cabanillas et.al., 2014; Dahlberg et.al., 2015
Satisfaction (SATF) I feel satisfied and will use mobile wallet in the future. I will always use mobile wallet in my daily life. I use mobile wallet frequently. I have a good experience with mobile wallet.	0.61-0.72	2.01 (.832)***	Xu & Du, 2018

*Note: FL= factor loading, EV= Eigen Value, *** = Cronbach's alpha*

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