Article

Factors Affecting Mobile Payment Adoption Intention: An Indian Perspective

Amit Shankar[1]
Biplab Datta[1]

Abstract

This study aims to identify the factors affecting mobile payment (m-payment) adoption intention in India by proposing a conceptual framework based on technology acceptance model (TAM). In addition to construct of TAM, four user-centric constructs have been added to evaluate m-payment adoption intention in India. The proposed research framework was empirically tested by data collected from 381 potential m-payment service users, through online and offline survey. Data were analysed using structural equation modelling (SEM) technique. The results exhibit that perceived ease of use (PEOU), perceived usefulness (PU), trust, and self-efficacy (SE) have a significant positive impact on m-payment adoption intention. However, subjective norms (SN) and personal innovativeness (PI) have no significant impact on m-payment adoption intention. Findings of the study have important theoretical and practical implications, particularly to understand important user-centric factors affecting m-payment adoption.

Keywords

m-Payment, TAM, adoption intention, trust, SEM

Introduction

The innovation in technology and robust line blend of it with information technology have made the mobile phone a strategic and profitable tool for delivering the products, services and information (Bauer, Reichardt, Barnes & Neumann, 2005; Hsu & Kulviwat, 2006; Varshney & Vetter, 2002). Mobile commerce (m-commerce) has emerged as a new platform for satisfying the different routine needs of consumers (Skeldon, 2011), and m-payment service has major contribution in the potential development of m-commerce. m-Payment enables users to make payment and fund transfer in comfortable and efficient manner (Mallat, Rossi & Tuunainen, 2004). The consumers have exercised positive adoption behaviour towards mobile banking, mobile retailing, mobile health and mobile media (Barutcu, 2008; Xu, Teo, Tan & Agarwal, 2009). However, less than one per cent of smartphone users have used m-payment

[1] Vinod Gupta School of Management, Indian Institute of Technology, Kharagpur, India.

Corresponding author:
Amit Shankar, Vinod Gupta School of Management, Indian Institute of Technology, Kharagpur-721302, India.
E-mail: amitshankar@iitkgp.ac.in

services worldwide (Schierz, Schilke & Wirtz, 2010). The most important question in front of m-payment service providers is the reason why there is slow adoption of m-payment? So it is required to explore the factors influencing m-payment adoption intention (Dahlberg, Mallat, Ondrus & Zmijewska, 2008). m-Payment adoption is of considerable attention for managers and researchers as commercial organization, payment service provider, software service provider and third party can get great benefit from it (Lim, 2008; Ondrus & Pigneur, 2006). So the study attempts to explore factors influencing m-payment adoption intention.

The remaining of the article is structured as follows. Second section focuses on review of literature and in third section, rational of study is described. The research objective is presented in fourth section. Fifth section focuses on research methods which implied in the study. Sixth section presents the theoretical framework followed by seventh section which focuses on data analysis. Discussion of the findings is presented in eighth section followed by conclusion in ninth section. Tenth section describes the implications of the study followed by limitation and suggestion for future research in eleventh section.

Literature Review

Technology Acceptance Theories

Many research models have been proposed to describe information technology adoption and usage behaviour in recent past (Kim, Mirusmonov & Lee, 2010; Oliveira, Thomas, Baptista & Campos, 2016). In 1975, Fishbein and Ajzen have introduced the theory of reasoned action (TRA) with constructs attitude and SN to determine behavioural intention (BI). The theory of planned behaviour (TPB) proposed by Ajzen (1985, 1991) was the successor of TRA with the third independent determinant named perceived behaviour control. The technology acceptance model (TAM) is the most influential and most frequent used model for determining technology adoption behaviour (Hong, Thong & Tam, 2006). The TAM was introduced by Davis (1989) to describe the deliberate act of user while adopting new technology. Perceived usefulness (PU) and perceived ease of use (PEOU) have been identified as most salient determinants of users' intention in most of the studies (Chen, 2008; Kim et al., 2010; Peng, Xiong & Yang, 2012; Zarmpou, Saprikis, Markos & Vlachopoulou, 2012). Later, many authors have adopted this model to explore user adoption intention in different culture and contexts. In TAM2 (Venkatesh & Davis, 2000), SN, image, job relevance, output quality and demonstrability have been used as additional determinants. All additional factors have a significant impact on PU but SN also has influence on intention to use. Venkatesh, Morris, Davis and Davis (2003) have identified performance expectancy, social influence, effort expectancy and facilitating condition as determinants of usage intention and behaviour in their unified theory of acceptance and use of technology (UTAUT) model. The UTAUT also introduces gender, age, experience and voluntariness as moderating variables. Although there are so many studies available involving TAM (Hong et al., 2006), the model should continue to be explored in different population and contexts (Luarn & Lin, 2005).

m-Payment

m-Payment facilitates efficient and secure commercial transaction between service provider and consumers (Ondrus & Pigneur, 2006). m-Payment is initiation, authorization and completion of financial transaction through mobile devices (Mallat, 2007). Short message service (SMS), unstructured supplementary

service data (USSD), wireless application protocol (WAP) and mobile wallet and near field communication (NFC) are the major means of m-payment. The extensive use of mobile phone is suitable for adoption of m-payment which provides a platform to customers for cashless transaction (Pham & Ho, 2015), fast and convenient transaction (Teo, Tan, Ooi, Hew & Yew, 2015), and high-volume secure transactions (Leong, Hew, Tan & Ooi, 2013). Consumers and service providers both get considerable benefit by using m-payment. In many countries, m-payment services grow rapidly as market entities comprehend its benefits (Merritt, 2011). Organizations may use m-payment as a strategic tool to gain competitive advantage (Ondrus & Pigneur, 2006). Some authors have termed mobile banking and mobile payment as equivalent or similar phenomena (Donner & Tellez, 2008; Slade, Williams & Dwivedi, 2013). However, these two systems are distinctive in terms of the number of parties involved. In mobile banking, banks are directly connected with the user, while in m-payment, a third party is mandatory to fulfil the complete process (Oliveira et al., 2016).

Previous Studies Related to m-Payment Adoption Intention

Mallat (2007) explored relative advantage, compatibility, complexity, costs, network extension, trust and perceived security risks as determinants of m-payment through focus group analysis. Pousttchi and Wiedemann (2007) conducted a study on m-payment adoption in Germany in the light of TAM with some extended constructs. They argued that PU, PEOU and task-technology fit have significant impact on m-payment adoption intention. However, subjective security has insignificant impact on it. Through detailed literature review, Dahlberg et al. (2008) concluded that consumer and technical perspectives are well covered by existing research but impact of social and cultural factors on m-payment adoption is less explored. Kim et al. (2010) adopted TAM model with two consumer-centric and four systems that characterizes to explain the factors affecting m-payment adoption in Korea. They found that PI and m-payment knowledge, mobility, reachability and convenience have significant impact on m-payment adoption. However, compatibility has no role in m-payment adoption decision. Zhou (2011) conducted a study to measure the effect of trust on m-payment adoption intention in China. Findings of the study suggested that perceived security, perceived ubiquity and PEOU have significant impact on trust and trust has direct impact on usage intention. Keramati, Taeb, Larijani and Mojir (2012) examined the impact of technological and behavioural factors on m-payment adoption. Findings of the study suggested that ease of use, usefulness, trust, compatibility, cost, norm, payment habit, skills and convenience have significant impact on adoption intention. They have also examined impact of cultural and demographic characteristics on adoption behaviour. Arvidsson (2014) adopted TAM and DOI model to explore m-payment adoption intention in Sweden and explained that PEOU, PU, relative advantage, high trust, low perceived security risks, higher age and lower income have positive association with adoption. The TAM model has been used by Duane, O'Reilly and Andreev (2014) in Ireland to confirm the positive impact of PEOU, PU and trust on m-payment service adoption. Phonthanukitithaworn, Sellitto and Fong (2015) also studied the factors affecting m-payment adoption behaviour of early adopters in Thailand through TAM and found that PEOU, PU, compatibility, SN, perceived trust and perceived cost have significant impact on adoption intention. Ting, Yacob, Liew and Lau (2015) compared the consumer adoption behaviour in China and Malaysia with TPB model and argued that attitude, SN and perceived behaviour have significant impact on m-payment adoption in both the countries. de Sena Abrahão, Moriguchi and Andrade (2016) adopted UTAUT model to examine m-payment usage intention in Brazil. They described that social influence, performance expectation and effort expectation have positive impact and perceived risk has negative impact on it. To explore stakeholders' expectation, Apanasevic, Markendahl and

Arvidsson (2016) conducted a study in Sweden and concluded that technological feasibility, lower service cost, added value of a service and ease of use have significant impact on customer as well as stakeholders' expectation in m-payment service. Recently, Oliveira et al. (2016) used UTAUT2 and DOI models to examine adoption intention in Portugal and found innovativeness, compatibility, performance expectancy, effort expectancy and social influence have a significant association with m-payment usage intention. In comparison with internet banking and mobile banking, m-payment is relatively under-explored arena of research. The study still comments that m-payment adoption research is in its early stage (Slade et al., 2013).

There is significant increase in m-payment adoption studies in recent years (Dahlberg et al., 2008). In the last couple of years, the introduction of NFC embedded smartphones has supported m-payment adoption. However, there have been few studies published in top tier journals (de Sena Abrahao et al., 2016; Oliveira et al., 2016; Slade et al., 2013; Tan, Ooi, Chong & Hew, 2014). Previous studies have pointed out that there is a need for more exploration in the field of m-payment adoption. Most of the studies have been conducted in the early stage and rigorous research is required in the area of m-payment (Dahlberg et al., 2008).

Objectives

The objective of this empirical study is twofold. First, we explored the determinants of m-payment adoption intention by review of previous related literature, and an extended TAM model has been proposed to understand consumer m-payment adoption intention in Indian context. Trust, PI, SNs and SE are the four additional constructs that were adopted from the technology adoption-related literature. Second, we identified the factors that have crucial impact on m-payment adoption intention in India for better understanding of the context.

Rational of the Study

Availability of mobile devices and internet connection are the key drivers of the digital payment system. In India, there are more than 1 billion mobile phone subscribers and 333 million internet users (TRAI, 2017 February). According to the State of Broadband (2016) report, India has outdone the USA to become the second biggest Internet and smartphone market in the globe (TRAI, 2017 February). Many initiatives have been taken by banks and other financial institutions for using mobile as a channel of financial transactions. In India, with substantial 165.04 per cent urban and 52.84 per cent rural wireless teledensity, overall mobile penetration rate is 89.90 per cent (TRAI, 2017 February). According to ASSOCHAM (2016 December), in the financial year 2016, the total 2.9 billion m-payment transactions were reported and volume is expected to reach around 460 billion by the year 2022 with a substantial growth rate of 132 per cent. In the year 2016, total value of the m-payment transaction was reported INR 8.2 trillion and by the year 2022, value is expected to pass the mark of INR 2205 trillion with a growth rate of 150 per cent.

Recently, the Indian government decided to ban old five hundred and thousand rupees currency and introduced new currency denomination of five hundred and two thousand rupees. Government also set a specific limit to ATM withdrawal which resulted in currency scarcity in the market. For the purpose of cashless economy, government is promoting online transaction. In current scenario of currency crisis, mobile phone can emerge as new channel for financial transaction. According to Bloomberg, only

53 per cent Indians have bank account, in which most accounts have zero balance. However, more than 80 per cent people are using mobile phones. Above statistics suggest that there is enormous potential for m-payment in Indian market and after demonetization, it is the need of the time for exploring the full potential of m-payment.

Research Method

Construct Measurement

Based on review of literature pertaining to m-payment and other adoption intention-related literature, a survey instrument has been developed as part of this study. A five-point Likert scale (anchored at strongly disagree = 1 and strongly agree = 5) has been used to collect the responses. The initial questionnaire has been pretested by sending it to professors specialized in electronic commerce subject. Then, the instrument has been pilot-tested with 30 respondents who are using m-payment service frequently. These multiple phases of development process ensure significant degree of refinement and provide face validity of the measures (Nunnally, 1978).

Data Collection

A structured questionnaire consisting of 31 items (Appendix A) was used to conduct the online as well offline survey. An online survey has been carried out by sending the questionnaire to acquaintances by email and posting it on Facebook and LinkedIn. The offline survey was conducted by visiting institutions, banks, cyber cafe, conferences and coaching institutes in India. Non-probability convenience sampling method was used to select the sample for the study. To ensure behavioural experience of the respondents with m-payment, responses have been collected from m-payment users only. Initially, 476 responses were received and finally 381 valid survey responses were included in the study after removing incomplete and invalid responses.

Theoretical Framework

In the arena of m-commerce adoption, many researchers have tried to measure different factors in different context and culture. Kim and Zhang (2009) estimated that there are no fixed factors which affect adoption intention, numerous factors which can influence it in different culture and contexts. While several attempts have been made to measure mobile commerce adoption behaviour, there are very few studies that have been carried out to measure m-payment adoption intention.

The TAM is widely adopted and robust model in information technology adoption-related studies (Arvidsson, 2014; Chen, 2008; Duane et al., 2014; Keramati et al., 2012; Kim et al., 2010; Venkatesh & Bala, 2008; Venkatesh & Davis, 2000; Yan, Md-Nor, Abu-Shanab & Sutanonpaiboon, 2009). This study uses TAM as a theoretical base to hypothesize and examine an integrated model to explore factors affecting m-payment adoption intention in India. In addition to TAM, constructs such as trust, SN, personal innovation and SE have been added as the antecedents of adoption intention. Extended constructs have been adopted from existing m-payment adoption literature. The proposed research model consists of different independent variables (trust, PI, PU, PEOU, SN and SE) and BI to adopt m-payment as the dependent variable.

Trust

Trust can be defined as positive expectation of consumer towards service provider (Mayer, Davis & Schoorman, 1995). Trust consists of three beliefs: integrity, ability and benevolence (Palvia, 2009). Integrity is the capability of m-payment service entities to keep their obligations. Ability means parties have enough technical knowledge to fulfil their promises. Benevolence is service provider's concern to safeguard consumer interest. In electronic services, trust is the most important determinant which affects consumer perception (Mallat, 2007; Yan et al., 2009). Consumer acceptance of electronic payment requires a belief that concerns of the customers will be addressed (Gupta & Sareen, 2001). Srivastava, Chandra and Theng (2010) proposed a trust-theoretic model and identified trust as most important construct compared to other factors trough an empirical study in Singapore. Perceived ubiquity, PEOU and perceived security have significant impact on initial trust, which is a significant predictor of m-payment usage intention (Zhou, 2011). Based on trust transfer theory and valence framework, Lu, Yang, Chau and Cao (2011) proposed a trust-based decision-making model in the context of m-payment. Findings of the study suggested that trust has significant impact on cross-environmental relationship and BI. Information and service quality have positive impact on trust and trust leads to users' continuation of m-payment usage (Zhou, 2013). While using m-payment services, personal and financial information shared by consumers so, trust plays important role in m-payment adoption intention (Duane et al., 2014; Kim et al., 2010). Trust has been studied as a multidimensional construct in different social sciences domain (Bhattacherjee, 2002; Carlos Roca, José García & José de la Vega, 2009). So, for better understanding, we have used multi-item scale to measure consumer trust.

Perceived Ease of Use

Davis (1989) defined ease of use as the degree of beliefs that using a particular technology will be effortless. Chen (2008) proposed a model based on TAM and innovation diffusion theory (IDT) and found PEOU as crucial determinant of m-payment acceptance. Some of the studies have examined PEOU as an important determinant influencing m-payment adoption at the retail point of sale (Apanasevic et al., 2016; Dahlberg et al., 2008; Duane et al., 2014; Kim et al., 2010; Schierz et al., 2010; Viehland & Leong, 2010). In many m-commerce and m-banking adoption studies, PEOU has been identified as a crucial antecedent of adoption intention (Kim, Shin & Lee, 2009; Peng et al., 2012; Shankar & Kumari, 2016; Zarmpou et al., 2012).

Perceived Usefulness

The PU is the degree of consumer's beliefs that adopting particular technology will enhance their performance (Davis, 1989). In the context of m-payment, smooth transactions such as online utility bill payment, mobile and dish TV recharge, sending and receiving money, mobile shopping, balance transfer and ticket booking are the indicators of system usefulness. Before adopting any new technology, consumers critically evaluate all the benefits they will get after using it. Kim et al. (2010) analysed the impact of user-centric and characteristics of system on m-payment usage across different types of users and found that PU has significant positive impact on m-payment usage. The PU has been empirically validated as a crucial antecedent of new technology adoption intention (Apanasevic et al., 2016; Arvidsson, 2014; Chen, 2008; Duane et al., 2014; Keramati et al., 2012; Kim et al., 2010).

Personal Innovativeness

Agarwal and Prasad (1998) defined PI as consumer willingness to try out any new technology. It is an inherent part of individual personality and the level of innovativeness varies from customer to customer (Gupta, Xu & Zhang, 2011; Im, Bayus & Mason, 2003). Domain-specific innovativeness supports the user in adoption of technological innovation (Yi, Fiedler & Park, 2006). Innovativeness positively influences the consumers to adopt mobile retailing (Bauer et al., 2005). Yang, Lu, Gupta, Cao and Zhang (2012) explored factors affecting pre-adoption and post-adoption stages of m-payment adoption in China and concluded that PI is a crucial determinant for adoption and use of m-payment. Kim et al. (2010) explained that personal innovation positively influences PEOU, which is a curial determinant of m-payment adoption. They argued that innovative late adopters respond positively to the use of m-payment technology. Innovative person can critically examine the usefulness and ease of use of any technology-based services (Lu, Yao & Yu, 2005) In India, majority of people do not have experienced new information technology and mobile services. So, PI can play a crucial role in m-payment adoption intention.

Subjective Norm

Subjective norm is the degree of individual attention influenced by other societal members' opinion while taking a particular decision (Ajzen & Fishbein, 1975). The SN has been employed in TPB model and many studies identified it as a crucial determinant of technology-based services adoption intention (Amin, Hamid, Lada & Anis, 2008; Chong, Chan & Ooi, 2012; Oliveira et al., 2016; Ting et al., 2015; Venkatesh & Davis, 2000; Yan et al., 2012). Based on TAM theory, Schierz et al. (2010) explained that SN, compatibility, individual and mobility have significant impact on consumers' acceptance of m-payment services. Positive word of mouth is an important factor of electronic payment communication source, which increases awareness among users (Bapat, 2012). Positive opinions of friends, relatives, peers and family members motivate an individual to adopt new services and individual start perceiving that services are useful (Schepers & Wetzels, 2007).

Self-efficacy

The degree to which an individual believes in performing any specific activity with the skill they are having refers to SE (Hsu, Chang & Yen, 2011; Lai, 2008). Lee, Hsieh and Huang (2011) argued that SE has positive impact on consumer intention to adopt mobile advertisement. Igbaria and Iivari (1995), Pedersen (2005) and Chen, Chen and Yen (2011) have also found that SE has direct positive impact on PEOU in new technology adoption. Khalifa and Ning Shen (2008) demonstrated the influence of social and individual characteristic on m-commerce. They further explained that SE has positive impact on m-commerce adoption intention. Transactional SE has a crucial impact on purchase intention in the context of electronic commerce.

On the basis of detailed literature review, a research framework has been proposed to examine the impact of various determinants on m-payment adoption behaviour in India (Figure 1).
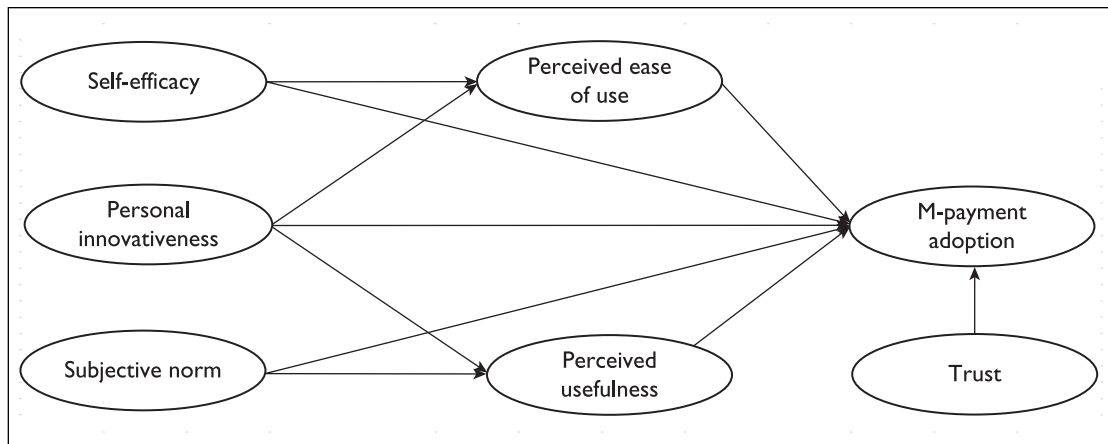
Figure 1. m-Payment Adoption Intention Model

Source: Prepared by the authors.

Data Analysis

Descriptive statistics has been used for demographic analysis of the respondents. Internal consistency using Cronbach's alpha value has been calculated to check construct reliability. Next, convergent validity and discriminant validity were tested. Common latent factor method has been used to check the common method bias in the data set. The result indicates that the difference between standard loadings without common latent factor and with common latent factor is less than 0.2 for all observed variables. It indicates that data set does not suffer from common method bias (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). Confirmatory factor analysis (CFA) has been used to analyse significant cross-loading on latent construct and subsequently covariance-based structural equation modelling (SEM) using AMOS 22 was used to check significant relationship between theoretical constructs.

Demographic Analysis

Three hundred and eighty-one valid responses have been used for the empirical analysis. The demographic characteristic of the respondents is exhibited in Table 1. Three out of four respondents were male (76 per cent) and rest one-fourth were female (24 per cent). Most of the respondents (61 per cent) were from the age group of 21–40 years. In terms of occupation, approximately half of the (47 per cent) respondents were students followed by employees (28) and businessmen (18 per cent). With regard to education level, 40 per cent of the respondents were graduate, 33 per cent were post graduate, and 12 per cent of total sample consisted of research scholars. The majority of the respondents were early adopters as 32 per cent users have less than six-month experience and 76 per cent were using m-payment services from less than one year. Most of the respondents are infrequent users of m-payment as only 29 per cent users used it once per day.

Table 1. Demographical Characteristics of Respondents

Measure	Item	N	%
Gender	Male	289	76
	Female	92	24
Age	Below 20	83	22
	21–30	144	38
	31–40	87	23
	41–50	34	9
	Above 51	33	9
Occupation	Student	179	47
	Employee	106	28
	Business man	68	18
	Other	28	7
Education level	High school	57	15
	Graduation	154	40
	Post-graduation	124	33
	PhD	46	12
Years using m-payment	< 6 months	123	32
	6 months to 1 year	168	44
	1 to 3 years	57	15
	> 3 years	33	9
Frequencies using m-payment	One time every day at least	110	29
	One time every week at least	163	43
	One time every month at least	76	20
	One time every year at least	32	8

Source: Authors' own findings.

Reliability and Validity Analysis

Reliability is the first criteria for the assessment of a model. In this model, Cronbach's alpha values of all constructs are more than 0.847 (Table 2). Cronbach's alpha values more than 0.7 are a good indicator of reliability (Henseler, Ringle & Sinkovics, 2009; Nunnally, 1978). Average variance extracted (AVE) of all constructs is more than 0.5 and value of all composite reliability (CR) is higher than 0.7 (Table 2) which indicates convergent validity (Kline, 2010). Discriminant validity has been evaluated by comparing AVE with the squared correlation of the estimates. Table 3 exhibits that AVE value of all constructs is higher than squared inter-construct correlation. Therefore, the proposed model is reliable as well as valid for further analysis.

Structural Model Assessment

The structural model indicates adequate model fit (GFI = 0.827; AGFI = 0.792; NFI = 0.873; CFI = 0.911; RMSEA =0.072) (Byrne, 2013; Hair, William, Barry & Rolph, 2010). Explained variance of the dependent construct is the primary criteria for measuring significance of a structural model (Chin, 1998). Here, the value of R^2 is 0.772 which indicates that proposed model is explaining 77.2 per cent of m-payment adoption intention. The structured model indicates that eight out of 10 path coefficients are statistically significant (Table 4). The result found that trust ($\beta = 0.136$, $p<0.001$), PEOU ($\beta = 0.503$,

Table 2. Standardized Item Loadings, Cronbach's α, AVE and CR

Construct	Items	Standardized Loading	Cronbach's α	AVE	CR
Perceived ease of use (PEOU)	PEOU1	0.93	0.867	0.696	0.872
	PEOU2	0.867			
	PEOU3	0.688			
Perceived usefulness (PU)	PU1	0.791	0.847	0.607	0.836
	PU2	0.704			
	PU3	0.741			
	PU4	0.758			
Personal innovativeness (PI)	PI1	0.877	0.914	0.78	0.914
	PI2	0.885			
	PI3	0.889			
Self-efficacy (SE)	SE1	0.797	0.939	0.667	0.933
	SE2	0.761			
	SE3	0.776			
	SE4	0.891			
	SE5	0.852			
	SE6	0.883			
	SE7	0.744			
Subjective norm (SN)	SN1	0.677	0.866	0.7	0.873
	SN2	0.923			
	SN3	0.889			
Trust	TRUST1	0.709	0.943	0.688	0.939
	TRUST2	0.764			
	TRUST3	0.851			
	TRUST4	0.913			
	TRUST5	0.883			
	TRUST6	0.872			
	TRUST7	0.796			
m-Payment adoption intention	MPAI1	0.767	0.851	0.581	0.847
	MPAI2	0.743			
	MPAI3	0.829			
	MPAI4	0.707			

Source: Authors' own findings.

Table 3. Construct Cross-correlation Matrix and AVE Analyses

	PEOU	PU	PI	SE	SN	TRUST	MPAI
PEOU	**0.696**						
PU	0.188	**0.607**					
PI	0.076	0.018	**0.78**				
SE	0.097	0.181	0.029	**0.667**			
SN	0.290	0.099	0.121	0.154	**0.7**		
TRUST	0.030	0.193	0.034	0.171	0.066	**0.688**	
MPAI	0.076	0.248	0.017	0.142	0.075	0.232	**0.581**

Source: Authors' own calculations.

Table 4. Path Coefficients

Relation	Estimate	S.E.	*t*-Value	P
PEOU←SE	0.329	0.054	6.089	***
PEOU←PI	0.142	0.049	2.923	0.003**
PU←PI	0.08	0.035	2.253	0.024**
PU←SN	0.268	0.047	5.669	***
MPAI←SE	0.096	0.03	3.156	0.002**
MPAI←PEOU	0.503	0.043	11.74	***
MPAI←PI	0.03	0.027	1.113	0.266
MPAI←PU	0.319	0.052	6.157	***
MPAI←SN	0.03	0.034	0.874	0.382
MPAI←TRUST	0.136	0.04	3.414	***

Source: Authors' own calculations.
Note: ***$p \leq 0.001$, **$p \leq 0.05$.

$p<0.001$), SE ($\beta = 0.096$, $p<0.05$) and PU ($\beta = 0.319$, $p<0.001$) have significant positive impact on m-payment adoption intention. SE ($\beta = 0.329$, $p<0.001$) and PI ($\beta = 0.142$, $p<0.05$) have positive impact on PEOU. SN ($\beta = 0.268$, $p<0.001$) and PI ($\beta = 0.080$, $p<0.05$) have positive impact on PU. However, path coefficients exhibit that PI and SN have an insignificant impact on m-payment adoption intention.

Discussion

This study proposed a comprehensive model for examining the influence of various factors on m-payment adoption intention in India. We extended the model with four user-centric variables. The results exhibit that trust, PEOU, PU and SE have a significant positive impact on m-payment adoption intention. However, SN and PI have an insignificant impact on adoption intention (Figure 2). The results suggested that PEOU is the most influencing determinant of m-payment adoption intention in India. The significant influence of PEOU on adoption intention is consistent with the previous findings of m-payment adoption-related studies (Apanasevic et al., 2016; Arvidsson, 2014; Chen, 2008; Kim et al., 2010; Pousttchi & Wiedemann, 2007; Zhou, 2011). The user can adopt m-payment only when they find it easy in comparison with other traditional methods of financial transaction. The PU has crucial impact on technology-enabled product adoption intention which is consistent with the findings of many pervious m-payment adoption-related studies (Chen, 2008; Duane et al., 2014; Kim et al., 2010; Pousttchi & Wiedemann, 2007; Zhou, 2011). The user would adopt any new technology only when they found it useful to fulfil their specific need. The user would switch to another system for financial transaction if they perceived extra benefit in less or similar cost. Findings indicate that SE has significant impact on m-payment adoption intention. Finding of this study is consistent with the results of Shin (2009), Pedersen (2005), Chen et al. (2011) and Duane et al. (2014). Lee et al. (2011) concluded that SE has a significant impact on m-payment adoption intention as well as PEOU, which is consistent with the findings of the study. Consumer trust is a crucial factor while adopting technology-enabled services, as consumer trust reduces the customer perceived risk which leads to adoption (Mallat, 2007). The results also indicated that initial trust has significant impact on adoption intention. This finding is consistent with the findings of many m-payment adoption studies (Arvidsson, 2014; Duane et al., 2014; Phonthanukitithaworn et al., 2015;
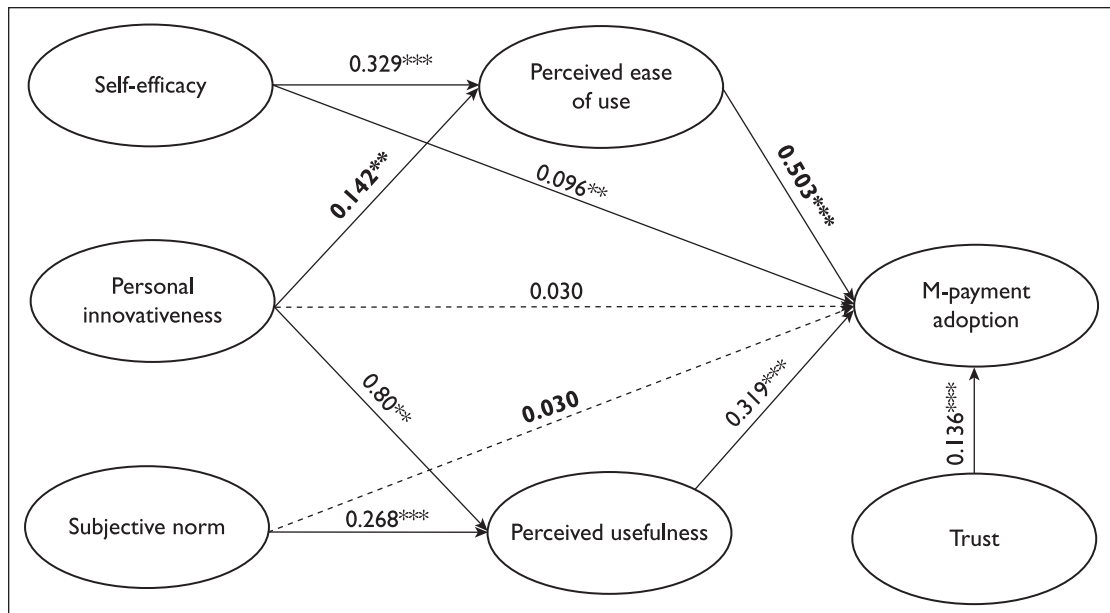
Figure 2. Structural Path Analysis for the Research Model and Hypotheses Testing

Source: Prepared by the authors.
Note: ***Significant at p ≤ 0.001, **Significant at p ≤ 0.05, -------------------- Not Significant.

Yan et al., 2009; Zhou, 2011). If users do not trust m-payment service provider, they may perceive that the service provider lacks in providing quality services. Results also indicate that perceived innovativeness plays insignificant role in m-payment adoption. This may be because of the reason that m-payment is perceived to be similar financial channel as m-banking, which does not require any specific knowledge.

Conclusion

As an alternative system of financial transaction, m-payment is getting attention of users globally. There is no study available to explore m-payment adoption intention in India. To fulfil the gap, a comprehensive model has been developed to explore factors affecting m-payment adoption intention in India. The findings exhibit that PEOU, PU, trust and SE have significant impact on adoption intention.

The study explores the factors which affect m-payment adoption intention in India. The result suggests that PE, PEOU, trust and SE have significant impact on adoption behaviour. However, PI and SN have not any significant impact on adoption intention. Results also indicate that SE and PI have significant impact on PEOU. Results suggest that PI and SN have significant impact on PU. Results also indicate that PEOU and PU are crucial factors which affect m-payment adoption intention. These findings provide a direction to m-payment service provider to understand user priorities. After getting information about user-centric factors, organizations can make their strategies accordingly. The organization can also position their services as per consumer choices, which may increase the pace of adoption. The results also provide crucial information to third party, bank and other entities involved in m-payment. This study will also help the government in implementing cashless economy and financial inclusion.

Implications

The pace of adoption has increased dramatically after demonetization of currency in India. Now people have limited choice other than cashless transaction for payment. m-Payment could be the best option for cashless transaction because of high wireless density. Most of the Indian banks have launched their wallet and advertising it heavily to tap the market. Existing m-payment service providers are also introducing innovative services to attract new users. As India is an emerging potential market for m-payment, this study provides better understanding of user-centric factors affecting m-payment adoption intention.

Increased popularity of mobile application will help in rapid growth of m-payment in the near future. From theoretical perspective, we tried to explore the factors affecting m-payment adoption intention through extended TAM. The result indicated that the proposed model has good explanatory power (77.2 per cent) to predict m-payment adoption intention. This study illustrates better explanatory power in comparison with other studies exploring adoption intention studies which explained 40–50 per cent of the variance (Miltgen, Popovič & Oliveira, 2013; Venkatesh & Davis, 2000). m-Payment is a new concept in emerging Indian market and very few research studies have been conducted in this area. So, this study will provide a base for further studies in the field of m-payment adoption intention. The proposed model can be tested and verified in other emerging markets for better understanding of m-payment adoption behaviour. This study will enrich m-payment adoption intention-related literature in the context of developing countries. This research will provide a direction to other researchers to explore crucial determinants of m-payment adoption intention in future.

From a managerial perspective, the findings of this study hold several implications for the upgradation of m-payment system to increase the pace of adoption in India. First, there is positive relation between SE and m-payment adoption which indicates that if users have technical knowledge, they easily adopt m-payment services. Service providers should organize campaigns to increase the awareness on the usefulness and convenience. Awareness about m-payment service will develop SE among users which will lead to positive adoption intention. Second, trust is another crucial issue that service providers should prioritize. Customer trust can be built by providing error-free, reliable and responsive customer services. Entities involved in m-payment services should ensure error-free and speedy transaction with round the clock for customer support. Third, both PEOU and PU have significant impact on m-payment adoption. Service provider should come up with some innovative strategies to develop a belief among users that this new system is more useful than traditional payment system. The design of m-payment application has significant impact on user acceptance. If application is easy to navigate and user-friendly, then consumers will easily adopt it.

This study is one of the few studies which have empirically investigated the factors affecting m-payment adoption intention in India, which is the fastest growing country in terms of mobile usage. Knowledge of factors affecting m-payment adoption intention could help service providers in developing their strategies to ensure that people use m-payment service.

Limitation and Future Research

This article examines crucial factors which affect adoption intention in the context of m-payment, but there are some limitations of this study. The respondents of this study are m-payment users only. A study could be conducted between users and non-users of m-payment to know the impact of different factors on both the groups. Furthermore, majority of the sample is between the age group of 21–40 years. Future study could be extended by multi-group analysis between different age group and better understanding

of adoption behaviour. This study is limited to Indian m-payment users only. Further studies are required to know the significant factors in other culture and contexts. This study is limited to user-centric factors only, and stakeholder-centric factors may also be considered for future research. Further research can be conducted to examine mediating effect of PEOU and PU to get better prediction model of adoption intention. A longitudinal study can better explore crucial factors affecting m-payment adoption intention.

Acknowledgement

Appendix A. Measurement Scales and Items

Perceived usefulness (PU)	(Davis, 1989; Kim et al., 2010)
PU1 using m-payment would enable me to pay more quickly.	
PU2 using m-payment makes it easier for me to conduct transactions.	
PU3 using m-payment would be advantageous.	
PU4 I would find m-payment a useful possibility for paying.	
Perceived ease of use (PEOU)	Davis (1989)
PEOU1 I believe that when I use m-payment, the process will be clear and understandable.	
PEOU2 I believe that it is easy for me to become skillful at using m-payment.	
PEUO3 I believe that m-payment is easy to use.	
Self-efficacy (SE)	(Agarwal & Prasad, 1998; Hoon et al., 2009; Murphy et al., 1989)
SE1 I feel confident using a mobile phone for social activities.	
SE2 I feel confident using a mobile phone to access online movies and music.	
SE3 I feel confident using a mobile phone to access online print news media.	
SE4 I feel confident using a mobile phone to access television news media.	
SE5 I feel confident using a mobile phone to watch television programmes.	
SE6 I feel confident using my mobile phone to access gaming services.	
SE7 I feel confident using my mobile phone for payment.	
Subjective norm (SN)	(Fishbein & Ajzen, 1975; Taylor and Todd, 1995)
SN1 People who are important to me think I should use m-payment	
SN2 People whose opinions I value are prefer me to use m-payment.	
SN3 People who are important to me (e.g., family members, close friends, and colleagues) support me to use of m-payment	
Personal innovativeness (PI)	(Agarwal & Prasad, 1998; Bauer et al., 2005; Gupta et al., 2011)
PI1 I like to experiment with new m-payment services.	
PI2 Among my peers, I am usually the first to try out new m-payment services.	
PI3 My peers highly rate my opinion of m-payment services.	
Trust (TRUST)	(Chau et al., 2007; Cheung & Lee, 2003; Pavlou, 2003)
TRUST1 I believe that legal frameworks for m-payment provision are sufficiently robust to protect consumers.	
TRUST2 I believe that m-payment service provider has sufficient expertise and resources to provide these services.	
TRUST3 I believe that m-payment service provider will act ethically when capturing, retaining, processing and managing my personal data.	
TRUST4 I believe that m-payment service provider act honestly in dealing with consumers.	
TRUST5 I am confident in the privacy controls of m-payment service provider.	

(Appendix A continued)

TRUST6 I believe that m-payment service provider implements adequate
security measures to secure my personal data.
TRUST7 I believe that M-payment parties will keep my best interests in mind.

M-payment adoption intention (MPAI)   (Kim et al., 2010)
MPAI1 Now I pay for purchases with a mobile phone.
MPAI2 Assuming that I have access to the m-payment, I intend to use it.
MPAI3 During the next six (6) months I intend to pay for purchases with a
mobile phone.
MPAI4 Five (5) years from now I intend to pay for purchases with a mobile
phone.

Source: Prepared by the authors on the basis of literature survey.

References

Agarwal, R., & Prasad, J. (1998). A conceptual and operational definition of personal innovativeness in the domain of information technology. *Information Systems Research*, *9*(2), 204–215.

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In Kuhl J., & Beckmann J. (Eds), *Action control* (SSSP Springer Series in Social Psychology, pp. 11–39). Berlin and Heidelberg: Springer.

———. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211.

Ajzen, I., & Fishbein, M. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.

Amin, H., Hamid, M.R.A., Lada, S., & Anis, Z. (2008). The adoption of mobile banking in Malaysia: The case of Bank Islam Malaysia Berhad (BIMB). *International Journal of Business and Society*, *9*(2), 43.

Apanasevic, T., Markendahl, J., & Arvidsson, N. (2016). Stakeholders' expectations of mobile payment in retail: Lessons from Sweden. *International Journal of Bank Marketing*, *34*(1), 37–61.

Arvidsson, N. (2014). Consumer attitudes on mobile payment services–results from a proof of concept test. *International Journal of Bank Marketing*, *32*(2), 150–170.

ASSOCHAM. (2016, December). *M-Wallet: Scenario Post Demonetisation*. Retrieved 18 January 2017, from http://www.assocham.org/upload/docs/M-Wallet_Report_press.pdf

Bapat, D. (2012). Customer relationship for electronic payment products: An empirical investigation in India. *Global Business Review*, *13*(1), 137–151.

Barutcu, S. (2008). Consumers' attitudes towards mobile marketing and mobile commerce in consumer markets. *Ege Academic Review*, *8*(1), 15–32.

Bauer, H.H., Reichardt, T., Barnes, S.J., & Neumann, M.M. (2005). Driving consumer acceptance of mobile marketing: A theoretical framework and empirical study. *Journal of Electronic Commerce Research*, *6*(3), 181.

Bhattacherjee, A. (2002). Individual trust in online firms: Scale development and initial test. *Journal of Management Information Systems*, *19*(1), 211–241.

Byrne, B.M. (2013). *Structural equation modeling with AMOS: Basic concepts, applications, and programming*. New York: Routledge.

Carlos Roca, J., José García, J., & José de la Vega, J. (2009). The importance of perceived trust, security and privacy in online trading systems. *Information Management and Computer Security*, *17*(2), 96–113.

Chen, L.D. (2008). A model of consumer acceptance of mobile payment. *International Journal of Mobile Communications, 6*(1), 32–52.

Chen, K., Chen, J.V., & Yen, D.C. (2011). Dimensions of self-efficacy in the study of smart phone acceptance. *Computer Standards and Interfaces*, *33*(4), 422–431.

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

Chong, A.Y.L., Chan, F.T., & Ooi, K.B. (2012). Predicting consumer decisions to adopt mobile commerce: Cross country empirical examination between China and Malaysia. *Decision Support Systems*, *53*(1), 34–43.

Dahlberg, T., Mallat, N., Ondrus, J., & Zmijewska, A. (2008). Past, present and future of mobile payments research: A literature review. *Electronic Commerce Research and Applications*, *7*(2), 165–181.

Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, *13*(3), 319–340.

de Sena Abrahão, R., Moriguchi, S.N., & Andrade, D.F. (2016). Intention of adoption of mobile payment: An analysis in the light of the Unified Theory of Acceptance and Use of Technology (UTAUT). *RAI Revista de Administração e Inovação*, *13*(3), 221–230.

Donner, J., & Tellez, C.A. (2008). Mobile banking and economic development: Linking adoption, impact, and use. *Asian Journal of Communication*, *18*(4), 318–332.

Duane, A., O'Reilly, P., & Andreev, P. (2014). Realising M-payments: Modelling consumers' willingness to M-pay using smart phones. *Behaviour and Information Technology*, *33*(4), 318–334.

Gupta, M.P., & Sareen, R. (2001). A study of consumer concerns and issues of electronic payments in India. *Global Business Review*, *2*(1), 101–119.

Gupta, S., Xu, H., & Zhang, X. (2011). Balancing privacy concerns in the adoption of location-based services: An empirical analysis. *International Journal of Electronic Business*, *9*(1–2), 118–137.

Hair, J.F., William, C.B., Barry, J.B., & Rolph, E.A. (2010). *Multivariate data analysis.* Englewood Cliffs, NJ: Prentice Hall.

Henseler, J., Ringle, C.M., & Sinkovics, R.R. (2009). The use of partial least squares path modelling in international marketing. *Advances in International Marketing*, *20*(1), 277–319.

Hong, S., Thong, J.Y., & Tam, K.Y. (2006). Understanding continued information technology usage behavior: A comparison of three models in the context of mobile internet. *Decision Support Systems, 42*(3), 1819–1834.

Hsu, H.S., & Kulviwat, S. (2006). An integrative framework of technology acceptance model and personalisation in mobile commerce. *International Journal of Technology Marketing*, *1*(4), 393–410.

Hsu, M.H., Chang, C.M., & Yen, C.H. (2011). Exploring the antecedents of trust in virtual communities. *Behaviour and Information Technology*, *30*(5), 587–601.

Igbaria, M., & Iivari, J. (1995). The effects of self-efficacy on computer usage. *Omega*, *23*(6), 587–605.

Im, S., Bayus, B.L., & Mason, C.H. (2003). An empirical study of innate consumer innovativeness, personal characteristics, and new-product adoption behavior. *Journal of the Academy of Marketing Science*, *31*(1), 61–73.

Keramati, A., Taeb, R., Larijani, A.M., & Mojir, N. (2012). A combinative model of behavioural and technical factors affecting 'Mobile'-payment services adoption: An empirical study. *The Service Industries Journal*, *32*(9), 1489–1504.

Khalifa, M., & Ning Shen, K. (2008). Explaining the adoption of transactional B2C mobile commerce. *Journal of Enterprise Information Management*, *21*(2), 110–124.

Kim, Y., & Zhang, P. (2009). Individual users' adoption of smart phone services. In *Proceedings of the ACM International Conference on Computer Human Interaction*. Retrieved 20 August 2016, from http://aisel.aisnet.org/sighci2009/19

Kim, G., Shin, B., & Lee, H.G. (2009). Understanding dynamics between initial trust and usage intentions of mobile banking. *Information Systems Journal*, *19*(3), 283–311.

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

Kline, R.B. (2010). *Principles and practice of structural equation modeling* (3rd ed.). New York: Guilford Press.

Lai, M.L. (2008). Technology readiness, internet self-efficacy and computing experience of professional accounting students. *Campus-Wide Information Systems*, *25*(1), 18–29.

Lee, C-C., Hsieh, M-C., & Huang, H-C. (2011). The influence of mobile self-efficacy on attitude towards mobile advertising. *AISS: Advances in Information Sciences and Service Sciences*, *3*(3), 100–108.

Leong, L.Y., Hew, T.S., Tan, G.W.H., & Ooi, K.B. (2013). Predicting the determinants of the NFC-enabled mobile credit card acceptance: A neural networks approach. *Expert Systems with Applications*, *40*(14), 5604–5620.

Lim, A.S. (2008). Inter-consortia battles in mobile payments standardisation. *Electronic Commerce Research and Applications*, *7*(2), 202–213.

Lu, J., Yao, J.E., & Yu, C.S. (2005). Personal innovativeness, social influences and adoption of wireless internet services via mobile technology. *The Journal of Strategic Information Systems*, *14*(3), 245–268.

Lu, Y., Yang, S., Chau, P.Y., & Cao, Y. (2011). Dynamics between the trust transfer process and intention to use mobile payment services: A cross-environment perspective. *Information & Management*, *48*(8), 393–403.

Luarn, P., & Lin, H.H. (2005). Toward an understanding of the behavioral intention to use mobile banking. *Computers in Human Behavior*, *21*(6), 873–891.

Mallat, N. (2007). Exploring consumer adoption of mobile payments–a qualitative study. *The Journal of Strategic Information Systems*, *16*(4), 413–432.

Mallat, N., Rossi, M., & Tuunainen, V.K. (2004). Mobile banking services. *Communications of the ACM*, *47*(5), 42–46.

Mayer, R.C., Davis, J.H., & Schoorman, F.D. (1995). An integrative model of organizational trust. *Academy of Management Review*, *20*(3), 709–734.

Merritt, C. (2011). Mobile money transfer services: the next phase in the evolution of person-to-person payments. *Journal of Payments Strategy & Systems*, *5*(2), 143–160.

Miltgen, C.L., Popovič, A., & Oliveira, T. (2013). Determinants of end-user acceptance of biometrics: Integrating the "Big 3" of technology acceptance with privacy context. *Decision Support Systems*, *56*, 103–114.

Nunnally, J. (1978). *Psychometric theory.* New York, NY: McGraw-Hill.

Oliveira, T., Thomas, M., Baptista, G., & Campos, F. (2016). Mobile payment: Understanding the determinants of customer adoption and intention to recommend the technology. *Computers in Human Behavior*, *61*, 404–414.

Ondrus, J., & Pigneur, Y. (2006). Towards a holistic analysis of mobile payments: A multiple perspectives approach. *Electronic Commerce Research and Applications*, *5*(3), 246–257.

Palvia, P. (2009). The role of trust in e-commerce relational exchange: A unified model. *Information & Management*, *46*(4), 213–220.

Pedersen, P.E. (2005). Adoption of mobile internet services: An exploratory study of mobile commerce early adopters. *Journal of Organizational Computing and Electronic Commerce*, *15*(3), 203–222.

Peng, R., Xiong, L., & Yang, Z. (2012). Exploring tourist adoption of tourism mobile payment: An empirical analysis. *Journal of Theoretical and Applied Electronic Commerce Research*, *7*(1), 21–33.

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

Phonthanukitithaworn, C., Sellitto, C., & Fong, M. (2015). User intentions to adopt mobile payment services: A study of early adopters in Thailand. *Journal of Internet Banking and Commerce*, *20*(1), 1–29.

Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y., & Podsakoff, N.P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879.

Pousttchi, K., & Wiedemann, D.G. (2007). *What influences consumers' intention to use mobile payments* (pp. 1–16). Los Angeles: Proceedings of the 6th Annual Global Mobility Roundtable.

Schepers, J., & Wetzels, M. (2007). A meta-analysis of the technology acceptance model: Investigating subjective norm and moderation effects. *Information and Management*, *44*(1), 90–103.

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

Shankar, A., & Kumari, P. (2016). Factors affecting mobile banking adoption behavior in India. *The Journal of Internet Banking and Commerce*, *21*(1), 1–24.

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

Skeldon, P. (2011). Growing consumer demand for mobile prompts massive investment in new multichannel platforms as retailers look to integrate everything. Retrieved 12 June 2016, from http://www.internetretailing.net/2011/06/growing-consumer-demandfor-mobile-prompts-massive-investment-in-new-multichannel-platforms-asretailers-look-to-integrate-everything/

Slade, E.L., Williams, M.D., & Dwivedi, Y.K. (2013). Mobile payment adoption: Classification and review of the extant literature. *The Marketing Review*, *13*(2), 167–190.

Srivastava, S.C., Chandra, S., & Theng, Y.L. (2010). Evaluating the role of trust in consumer adoption of mobile payment systems: An empirical analysis. *Communications of the Association for Information Systems*, *27*(1), 561–588.

Tan, G.W.H., Ooi, K.B., Chong, S.C., & Hew, T.S. (2014). NFC mobile credit card: The next frontier of mobile payment? *Telematics and Informatics*, *31*(2), 292–307.

Teo, A.C., Tan, G.W.H., Ooi, K.B., Hew, T.S., & Yew, K.T. (2015). The effects of convenience and speed in m-payment. *Industrial Management and Data Systems*, *115*(2), 311–331.

The State of Broadband. (2016, September). *Broadband catalyzing sustainable development.* Retrieved 18 January 2017, from http://www.broadbandcommission.org/Documents/reports/bb-annualreport2016.pdf

Ting, H., Yacob, Y., Liew, L., & Lau, W.M. (2016). Intention to use mobile payment system: A case of developing market by ethnicity. *Procedia-Social and Behavioral Sciences*, *224*, 368–375.

TRAI. (2017, February). *Telecom Subscription data as on 31st December 2016*. Retrieved 18 January 2017, from http://www.trai.gov.in/sites/default/files/Press_Release_11_17_Feb_2017_Eng.pdf

Varshney, U., & Vetter, R. (2002). Mobile commerce: Framework, applications and networking support. *Mobile Networks and Applications*, *7*(3), 185–198.

Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision Sciences*, *39*(2), 273–315.

Venkatesh, V., & Davis, F.D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, *46*(2), 186–204.

Venkatesh, V., Morris, M.G., Davis, G.B., & Davis, F.D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, *27*(3), 425–478.

Viehland, D., & Leong, R.S.Y. (2010). Consumer willingness to use and pay for mobile payment services. *International Journal of Principles and Applications of Information Science and Technology*, *3*(1), 35–46.

Xu, H., Teo, H.H., Tan, B.C., & Agarwal, R. (2009). The role of push-pull technology in privacy calculus: The case of location-based services. *Journal of Management Information Systems*, *26*(3), 135–174.

Yan, A.W., Md-Nor, K., Abu-Shanab, E., & Sutanonpaiboon, J. (2009). Factors that affect mobile telephone users to use mobile payment solution. *International Journal of Economics and Management*, *3*(1), 37–49.

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

Yi, M.Y., Fiedler, K.D., & Park, J.S. (2006). Understanding the role of individual innovativeness in the acceptance of it based innovations: Comparative analyses of models and measures. *Decision Sciences*, *37*(3), 393–426.

Zarmpou, T., Saprikis, V., Markos, A., & Vlachopoulou, M. (2012). Modeling users' acceptance of mobile services. *Electronic Commerce Research*, *12*(2), 225–248.

Zhou, T. (2011). The effect of initial trust on user adoption of mobile payment. *Information Development*, *27*(4), 290–300.

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