Behavioural intentions to adopt mobile wallets: a developing country's perspective

1. Introduction

The developing countries have witnessed a remarkable growth in the development of mobile communication technologies in the last decade. Significant investments have been made by telecommunications companies to improve connectivity for the masses by providing access to superior sorts of communications networks. Supported by the easy availability of prepaid recharge vouchers, low tariff rates and a variety of affordable handsets, mobile ecosystems have evolved into one of the most successful technological areas of the last couple of decades. Mobile phones have transformed the lives of millions of people and now play a catalytic role in the overall social and economic development of nations. This process has created a plethora of opportunities for the firms involved by creating mobile-technology-based business architectures (Akturan and Tescan, 2012). The convergence of such technology has had a colossal impact on overall development, and has been especially important for inclusive growth in developing countries.

Over the years, a mobile phone has evolved into a necessity. It is estimated that there are more cellphone users than there are bank account holders worldwide. The growing complexity of consumers' needs, the growing cost of connecting with customers via traditional methods and the need for customer-centric innovative business solutions have made it inevitable for businesses to design mobile-technology-based alternative business solutions (Kuganathan and Wikramanayake, 2014). Such service initiatives are known by various names including mobile commerce, mobile banking, mobile payment, mobile transfers and mobile wallets. Collectively, they offer a superior business model to companies wishing to connect with millions of citizens who are excluded from the financial mainstream (Duncombe and Boateng, 2009). This business model also offers great potential for generating additional revenue streams by which mobile operators may increase their average revenue per user (ARPU), which is abysmally low in Southeast Asia, Sub-Saharan Africa, and the Middle East. (Bossuyt and Hove, 2007).

The rapid penetration of mobile phones and the growing popularity of smartphones in the developing nations have created tremendous opportunities and severe challenges for conventional payment systems which are dominated by traditional banking and financial institutions (Duncombe and Boateng, 2009). As a result, there has been a remarkable growth in global mobile payment volumes. The worldwide mobile payment volume in 2015 was US$450 billion and is expected to surpass US$1 trillion in 2019 (Statista, 2016). However, at present, mobile payments in India form a miniscule part of the country's overall digital payments industry. Mobile payments are estimated to grow from $86 million in 2011 to $1.15 billion in 2016, with a compounded annual growth rate (CAGR) of 68 percent (Dhanorkar, 2016; Singh, 2016). This remarkable growth may be attributed to the fact that India, being a developing country, is home to more than 145 million unbanked families that can be newly included in the financial system via mobile phones (Singh, 2016). Moreover, with the increasing penetration of smartphones in developing nations such as India (which has a smartphone user base of 239 million people), payment systems are witnessing a remarkable change. People have started to trust and adopt online shopping as well as online payment services (Baidya, 2016). The Reserve Bank of India's data shows that up to November 2015, around 22 million credit cards had been issued by 55 banks, while a rough estimate has shown that there are more than 100 million mobile wallet users in India

(Chandran, 2016). Consequently, there has been a spurt in the number of firms offering mobile-based payment solutions to their customers in different markets. An increasing number of businesses now send information regarding billing, new product launches, payment confirmations and other details directly to customers' mobile phones. It is felt that due to embedded advantages, mobile wallet technology has the ability and potential to grow as an alternative payment channel (Duncombe and Boateng, 2009; Leavitt, 2012; Dennehy and Sammon, 2015).

Despite the inherent benefits of mobile wallet technology, the number of actual users of this service has remained low (Aggarwal, 2016). The basic problem lies in the attitudes and intentions of the customers at the bottom of the pyramid whose adoption of mobile wallets would be capable of providing the required level of scale and profitability to this relatively new technology (Gartner, 2015). This paper intends to understand the factors that influence mobile phone users' attitudes and intentions when adopting mobile wallet services, so that mobile wallet firms, mobile device manufacturers and regulatory bodies can create the required strategic framework to improve their adoption.

The present study is divided into four parts. The first part formulates the research problem. The second part details the proposed framework and hypothesis of the study. The third part covers the research methodology employed, a discussion and the implications of the study. Finally, the conclusion is drawn, limitations are outlined, and suggestions for future research are made.

2. Literature Review and Construct Development

The review of extant literature in this field reveals that several theoretical frameworks have been developed to examine adoption intentions for various information technologies and information systems (IT/IS). Notable among them are the theory of reasoned action (TRA) (Fishbein and Ajzen, 1975), the technology acceptance model (TAM) (Davis, 1989), the technology-organization and environment (TOE) framework (Tornatzky and Fleischer, 1990), the theory of planned behaviour (TPB) (Ajzen, 1991), the diffusion of innovations (DOI) theory (Rogers, 1995) and the unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003). Most of these theories have used underlying principles from the field of psychology, marketing and IT to understand the adoption intentions of various forms of IT/IS at the individual and firm levels. The robustness and explanatory power of these models vary, especially against the backdrop of advancements in IT/IS and the changing nature of consumer behaviour (Tan and Ooi, 2013). To improve the predictive ability, some of these models have been extended by subsequent studies. TAM2 (Venkatesh and Davis, 2000) and UTAUT2 (Venkatesh et al., 2012) are two such prominent extended frameworks which have been used to understand the adoption intentions related to contemporary IT/IS. Such frameworks have been used widely to understand the adoption intentions and diffusion processes across disciplines ranging from marketing and social psychology to new information systems (Williams et al., 2015).

A significant percentage of the research conducted in the area of mobile wallets has used the theoretical foundations of the TAM (Slade et al., 2014). In order to understand IT/IS adoption in the context of organizations, the classical TAM was developed and originally consisted of perceived ease of use (PEOU), perceived usefulness (PU), attitude (ATT) towards using a particular IT/IS, behavioural intention (BI) and actual use (AU) of an IT/IS (Wu and Wang, 2005). A review of IT/IS adoption research on Google Scholar and Scopus reveals that TAM has remained one of the most extensively used frameworks (Slade et al., 2015). The original model was extended by Venkatesh and Davis in 2000 by excluding ATT and adding two additional variables. social influence (SI) and cognitive instrumental processes (made up of

output quality, job relevance, result demonstrability and PU) which were considered to be essential factors for understanding the adoption intentions related to new IT/IS (Wu et al., 2011). Over the years, the original and extended versions of the TAM have provided a valid and reliable framework of research for understanding individual as well as organisational intents to adopt new IT/IS (Raaij and Schepers, 2008). However, the model was criticised heavily for its deterministic approach to accepting and rejecting new IT/IS by supplying very general information without considering the individual characteristics of users in the overall process (Agarwal and Prasad, 1999; Mc Master and Wastell, 2005; Slade et al., 2014).

UTAUT is yet another model which is used frequently by current researchers to examine the adoption intentions related to new IT/IS. This model decomposed eight previous models and proposed four major constructs to examine and predict an employee's acceptance of technology within an organizational context (Amoroso and Watanabe, 2011). The four constructs are performance expectancy (substituted for PU), effort expectancy (substituted for PEOU), facilitating conditions (FC) and SI. The variables collectively explained up to 70% of the variance in predicting intentions to use a new IT/IS, which was observed to explain just 40% in the case of TAM2 (Raaij and Schepers, 2008). To improve the parsimony and robustness of the original UTAUT, Vanketash, Thong and Xu (2012) extended it as UTAUT2 and introduced seven constructs including FC, performance expectancy (PE), effort expectancy (EE), SI, perceived value (PV), hedonic motivation (HM) and habit (H). However, both the UTAUT and UTAUT2 models are not free from limitations. Their biggest limitation is their inability to consider the role of culture in the adoption of a new IT/IS. These limitations necessitate the need for a further expansion of the model.

Marketing literature, over the years, has recognized the inconsistencies in the adoption pattern of various IT/IS across the world, which is hard to explain using a single, individual model. Such differences in adoption patterns are mainly attributed to factors such as government policy, industry leads, market environments and the like (Gong and Li, 2008; Alshamaila et al., 2013). Against this backdrop, the present study has used the basic framework of existing models and extended them by integrating perceived regulatory support (PRS) and promotional benefits (PBs) as two new variables to address the requirements and inherent characteristics of mobile wallet ecosystems.

2.1.Performance Expectancy (PE)

PE, from the point of view of consumers, may be defined as "*the degree to which using a technology will provide benefits to consumers in performing certain activities*" (Venkatesh et al., 2012, page 159 line 60-62). In the context of mobile wallets, PE may be explained as the degree to which consumers perceive that using it as an alternative technology for making payments will improve and speed up their performance while conducting their daily sales and purchasing transactions. This construct is similar to PU, as it has been incorporated in the TAM (Davis, 1989). PU is defined "*as the degree to which a person believes that using a particular system would enhance his or her job performance*" (Davis, 1989, page 320 line 57-60). Models like TAM2 (Venkatesh and Davis, 2000), as well as TAM3 (Venkatesh and Bala, 2008), have also validated the significance of this factor in determining technology adoption. PE was a major construct in the UTAUT model as well (Venkatesh et al, 2003). Other than these models, various researchers have considered the role of this factor in determining mobile wallet adoption intentions, (Lee et al., 2004; Shin, 2009; Schierz et al., 2010; Kim et al., 2010; Wang and Yi, 2012; Amoroso and Magnier-Watanabe, 2012; Pham and Ho, 2014; Slade et al., 2015; Yan and Yang, 2015). Hence, it is proposed that

H1: The higher the performance expectancy, the higher is the behavioural intention to adopt a mobile wallet.

2.2.Effort Expectancy (EE)

From the consumers' perspectives, EE may be defined as "*the degree of ease associated with consumers' use of technology*" (Venkatesh et al., 2012, page 159 line 62-63). It is the extent to which consumers expect mobile wallet technology to be free from effort and easy enough to learn, so as to be adopted in their daily lives. This construct is similar to PEOU, an important construct in the TAM (Davis, 1989). The TAM defined PEOU as "*the degree to which a person believes that using a particular system would be free of effort*" (Davis, 1989, page 320 line 70-72). Numerous researchers have integrated EE as a major factor to determine the adoption intentions related to various IT/IS (Lee et al., 2004; Shin, 2009; Kim et al., 2010; Schierz et al., 2010; Wang and Yi, 2012; Amoroso and Magnier-Watanabe, 2012; Pham and Ho, 2014; Yan and Yang, 2015). The UTAUT model (Venkatesh et al., 2003), developed in the context of organisational information systems, also suggested this construct was an important factor for consideration. Hence, it is proposed that

H2: The higher the effort expectancy, the higher is the behavioural intention to adopt a mobile wallet.

2.3.Social Influence (SI)

SI refers to the extent to which consumers' decisions to use a product or a service are affected by the opinions of their families, relatives or friends (Riquelme and Rios, 2010). SI may be defined as *"the extent to which consumers perceive that important others (e.g. family and friends) believe they should use a particular technology"* (Venkatesh et al., 2012, page 159 line 64-66). This construct has been widely accepted by earlier researchers as an important factor while determining the adoption intentions of technologies similar to the mobile wallet (Lee et al., 2004; Schierz et al., 2010; Amoroso and Magnier-Watanabe, 2012; Yang et al., 2012). Existing models such as TAM2 (Venkatesh and Davis, 2000), UTAUT (Venkatesh et al., 2003) and UTAUT2 (Venkatesh et al., 2012), when employed to explain usage intentions for similar technologies, also include SI as an important construct. Hence, it is proposed that

H3: The higher the degree of social influence, the higher is the behavioural intention to adopt a mobile wallet.

2.4.Facilitating Conditions (FCs)

FCs include the resources and the physical environment required for effective adoption and use of any product, service or technology. FCs refer to the belief of an individual about having access to the necessary resources needed to facilitate any service (Cheong et al., 2004). FCs have been considered by many earlier researchers as important factors determining usage intentions in a significant way for similar technologies such as the Internet, mobile commerce, mobile banking and the like (Yang, 2010; Amoroso and Magnier-Watanabe, 2012; Chong, 2013). Hence, it is proposed that

H4: The higher the accessibility to facilitating conditions, the higher is the behavioural intention to adopt a mobile wallet.

2.5.Perceived Value (PV)

PV refers to the value that consumers perceive they are to receive in exchange for the price that they pay to avail any product or service. PV may be explained as a trade-off between

what customers are receiving (in the form of quality, benefits and utilities) and what they are sacrificing for it (mainly in the form of price) (Zeithmal, 1988; Keeney, 1999). This construct is another important factor that has had a significant influence on adoption intentions for Internet-related technologies, including mobile commerce, mobile banking, mobile wallets and the like (Pagani, 2004; Amoroso and Magnier-Watanabe, 2012; Slade et al., 2015). PV was also found to have a significant influence on adoption intentions by the UTAUT2 model (Venkatesh et al., 2012). Hence, it is proposed that

H5: The higher the perceived value, the higher is the behavioural intention to adopt a mobile wallet.

2.6.Perceived Risk (PR)

PR refers to any financial, social and product-associated risk that a consumer perceives while entering into some online transaction (Wu and Wang, 2005). Mobile phones usually store important personal information, which gives rise to the issues of security and privacy risks that are involved in making any transaction via a mobile wallet. Numerous researchers have included this factor in their studies and have validated its significant and negative influence on mobile wallet adoption intentions (Amoroso and Magnier-Watanabe, 2012; Pham and Ho, 2014; Liébana-Cabanillas et al., 2014; Slade et al., 2015). For the purpose of this study, risk mainly includes the security and privacy dimensions associated with mobile wallet transactions. Hence, it is decomposed from PV, which mainly considered to be the price paid to avail the additional value offered by mobile wallet services. Considering PV and security and privacy risks as distinct factors is consistent with earlier researches undertaken in the area of technology adoption (Amoroso and Magnier-Watanabe, 2012; Pham and Ho, 2014; Slade et al., 2015). Hence, it is proposed that

H6: The lower the perceived risk, the higher is the behavioural intention to adopt a mobile wallet.

2.7.Perceived Trust (PT)

The success of the dynamic relationship between a customer and marketer depends on the degree of mutual trust which exists between them. PT has acted as a catalyst for the success of various new IT/IS introduced in the recent past (Pham and Ho, 2014). It refers to the extent to which consumers perceive mobile wallet application providers to be trustworthy with respect to the security and privacy policies followed by them. Trust was considered to be an important factor in determining adoption intentions for similar technologies by other researchers as well (Chong et al., 2012; Zhang et al., 2012; Chong, 2013). Previous studies on mobile wallet adoption have recognised this factor as a strong predictor of adoption intentions (Dahlberg et al., 2003; Shin, 2009; Amoroso and Magnier-Watanabe, 2012; Xin, 2013; Pham and Ho, 2014). Hence, it is proposed that

H7: The higher the degree of perceived trust, the higher is the behavioural intention to adopt a mobile wallet.

2.8.Perceived Regulatory Support (PRS)

The presence of an efficient and sound regulatory support framework has an indispensable role to play in boosting consumers' confidence as well as in the successful functioning of the overall mobile wallet ecosystem. The formal organization of regulatory agencies such as legislatures, government agencies and trade unions, plays a very significant role in creating

and shaping the normative rules prevailing in a society which, in turn, influence the behaviour as well as the decision-making of individuals and organizations (Zhu, 2009). Unlike conventional marketing, the exchange process in mobile wallet transactions is performed in anonymity, whereby the contracting parties may not necessarily know each other while negotiating an agreement. Such anonymity makes customers suspicious and doubtful about the success of any transaction performed. A typical mobile wallet transaction involves the participation of a customer, the company, the Internet service provider, along with the payment gateway and a shipping agent. Problems may arise on the part of any of these parties during the exchange process.

Since the mobile wallet is a new phenomenon, a clear and transparent regulatory framework is essential to safeguard the interests of parties involved in the cases of any disputes arising at any stage during the process. Therefore, a sound regulatory framework may help the mobile wallet industry to flourish (Chandran, 2016). PRS may be defined as the degree to which consumers believe in the prevailing regulatory framework's capability to safeguard their interests, in the cases of any disputes arising at any stage, while performing a mobile wallet transaction. Constructs similar to PRS are frequently considered from the consumers' perspective in consumer behaviour literature (Haque et al., 2009; Alqahtani et al., 2012; AlGhamdi et al., 2013) However, there is an almost complete absence of literature which has incorporated and empirically tested this construct to understand mobile wallet adoption intentions. Hence, it is proposed that

H8: The higher the perceived regulatory support, the higher is the behavioural intention to adopt a mobile wallet.

2.9.Promotional Benefits (PBs)

The adoption of a new IT/IS is also affected by perceptions of the benefits it offers to its users. It is especially true in the case of consumer-based technology adoption in contrast with most of the existing technology adoption studies which have been conducted primarily in an organizational context. PBs may include various kinds of benefits such as app download cash rewards, coupon codes, cash discounts, loyalty points and other freebies which are offered by companies involved in providing mobile wallet services. These promotional benefits, in the forms of promotional codes or coupon codes, enhance the overall shopping experience of consumers and thus work well with both new and returning customers (Bigcommerce.com, 2015). A recent report reveals that more than 50% of online consumers in the UK change their purchase decisions on the basis of the offers and promotions made (Rapid Campaign Report, 2015; Brooks, 2015). U.S. consumers also showed a similar inclination towards promotions and offers in a survey conducted in 2014 (Brooks, 2015). With the growing competition and entry of new players into the mobile wallet landscape, such PBs may prove to be an important antecedent to mobile wallet adoption. Rational consumers evaluate all these benefits and make a decision balancing other factors as well. Such PBs are communicated to customers via mass media and have been found to influence consumer behaviour deeply. It is, therefore, proposed that

H9: The higher the promotional benefit, the higher is the buyer's behavioural intention to adopt a mobile wallet.

2.10. Behavioural Intention (BI)

BI refers to the measure or degree of intensity of an individual's intention to perform a specific behaviour (Fishbein and Ajzen, 1975). Various factors such as PE, EE, PR, SI, price, trust and the like have been measured to determine BIs towards technology adoption by many

previous researchers (Lee et al., 2004; Schierz et al., 2010; Yang et al., 2012; Amoroso and Magnier-Watanabe, 2012). In this study, BI is taken as a dependent variable.

3. Research Model

Figure 1 illustrates the proposed research model, which is based on the extensive literature review related in the previous section. The model asserts that the BI to adopt a mobile wallet is determined by the user's performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating conditions (FC), perceived value (PV), perceived risk (PR), perceived trust (PT), perceived regulatory support (PRS) and promotional benefits (PBs). The rationale for the variables and the proposed relationships between them is explained in the following section.

< Figure 1 to be inserted here>

4. Research Methodology

4.1.Participants

The information was obtained from postgraduate students and working professionals from the Delhi National Capital Region (Delhi NCR) in India with two preconditions. Firstly, the respondents had to have an Internet-enabled smartphone and, secondly, they had to have a bank account. Delhi NCR attracts youngsters from all Indian cities and thus represents a population which is cosmopolitan in nature (Yadav et al., 2016). Moreover, youngsters are considered to be more technologically savvy and constitute the largest segment of modern technology users (Davis, 1989; Hanafizadeh et al., 2014; Yadav et al., 2016). Therefore, the chosen sample was considered to be appropriate for the research area undertaken in the study.

4.2.Constructs Measurement

Of the nine independent variables considered in our research, two have been developed and introduced in the context of mobile wallet adoption studies for the first time. A multi-item scale was developed, consisting of 32 items identified to measure the independent variables and an additional three items were used to measure the dependent variable (BI). All the items were measured on a seven-point Likert scale ranging from "highly disagree (1)" to "highly agree (7)".

4.3.Research Instrument

The research instrument consisted of two parts. The first part recorded information on variables related to the ages, educations and incomes of the respondents. The second part obtained information on respondents' levels of agreement or disagreement with the 35 items selected to measure ten variables. A pilot survey was administered to pre-test and refine the survey questionnaire with over 20 respondents, who included, amongst others, two IT professionals from the banking sector and two faculty members who had an interest in this subject area. On the basis of the feedback obtained during the pilot testing phase, several iterations were made before the questionnaire was finalized. Items that displayed semantic differentials and were found to create ambiguity during feedback were modified and rephrased as were those items that were found to be irrelevant in the mobile wallet context.

On the basis of the data obtained during the pilot study phase, the content validities of the two proposed new variables (PRS and PB) were tested. The study adopted the criteria suggested by Lawshe (1975) to ensure content validity, which tested the relevance and

representativeness of the variables under consideration quantitatively, regarding their degree of "appropriateness and inappropriateness" for inclusion in the survey. The response of each item was calculated using the Lawshe content validity ratio (CVR) coefficient

$$CVR = ne - N/2$$

where, *ne* was the number of positive responses for each item, and *N* was the number of respondents. The *CVR* coefficient ranged from 0.7 to 0.81, which, as per the Lawshe coefficient, provided a score of sufficient content validity for the new variables. Depending upon the results, the questionnaire was finalized and circulated amongst the respondents.

4.4.Sampling

In light of the nature of research problems where there was a lack of a proper sampling frame for the population, this research used judgement, snowball and convenience sampling techniques. This was in line with other studies undertaken to understand IT/IS adoption that have been conducted in the recent past (Pham and Ho, 2014, Amoroso and Watanabe, 2012, Chong, 2012). The judgement and snowball sampling were mainly applied during the pilot testing phase only. The convenience sampling technique was utilized in the main survey that was conducted in the months of August and September 2015.

4.5.Data analysis

Table 1 below summarises the demographic profile of the respondents. It is observed that almost 79 percent of the sample comprised of male respondents, nearly 82 percent of the respondents were below the age of 30 years, and only 5 percent of them were above 40 years. 70 percent of respondents had an annual income of Rs. 5 lakhs or above. Moreover, almost all of them were either graduates or postgraduates.

<Table 1 to be inserted here>

The proposed model was tested to analyse the BI to adopt mobile wallet services, using the structural equation modelling technique in IBM SPSS Amos. Performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating conditions (FC), perceived value (PV), perceived risk (PR), perceived trust (PT), perceived regulatory support (PRS) and promotional benefits (PBs) were measured as independent factors determining the dependent factor, i.e. BI, to adopt mobile wallet services.

The measurement model created in Amos was tested by conducting confirmatory factor analysis (CFA). The five most common and widely represented model fit measures were considered to assess the overall goodness of fit of the proposed model. These measures were, the ratio of χ^2 to degrees of freedom (C-min/d.f.), the comparative fit index (CFI), the goodness-of-fit index (GFI), the normalized fit index (NFI) and the root mean square error of approximation (RMSEA).

Table 2 below demonstrates the model fit measures. It is observed that the values of CFI, GFI and NFI conformed to the widely accepted range of almost 0.9 or more than 0.9 and the RMSEA was less than 0.1 while the C-min/d.f. < 5. Hence, the measurement model observed a good fit with the data collected.

<Table 2 to be inserted here>

The study tested two types of validities, namely convergent validity and discriminant validity along with the reliability of the constructs. Table 3 below shows the results of the reliability and validity tests of the measurement model.

<Table 3 to be inserted here>

The reliability of the data collected was confirmed by computing Cronbach's alpha values in SPSS. Table 3 shows that the computed alpha values ranged from 0.876 to 0.954 which, being greater than 0.7, demonstrated the high reliability of the data. The average variance extracted (AVE) for each factor was more than 0.5 (ranging from 0.699 to 0.878), which further ensured convergent validity. The AVE was greater than the maximum shared squared variance (MSV) and the average shared squared variance (ASV), which showed that the data had discriminant validity as well. A structural model was constructed in Amos once the reliability and validity of the data was confirmed (see Figure 2) and the following output was generated:

<Figure 2 to be inserted here>

The proposed hypotheses were tested with the help of *p*-values computed for the structural model. Table 4 below shows *p*-values for each construct; it can be observed that these *p*-values came out to be less than 0.05 for all the factors except EE. This further supports hypotheses H1, H3, H4, H5, H6, H7, H8 and H9 and rejects hypothesis H2.

<Table 4 to be inserted here>

The results of the present study observed performance expectancy (*p*-value<0.001, β= 0.48**)** to have the strongest influence on consumers' BI to adopt a mobile wallet, followed by perceived trust (*p*-value<0.001, β= 0.44**),** which was the second strongest factor. (See Table 4 above.)

5. Discussions and Conclusion

The aim of this research was to analyse users' acceptance of mobile wallet services and to identify the main factors that have a significant impact on it. The study successfully extended the existing technology adoption frameworks to include two new variables. Results indicated that factors such as performance expectancy (*p*-value-<0.001), social influence (*p*-value-<0.001), facilitating conditions (*p*-value-0.021), perceived value (*p*-value-0.15), perceived trust (*p*-value-<0.001), perceived regulatory support (*p*-value-0.005) and promotional benefits (*p*-value-<0.001) had a positive influence on mobile wallet BI. Whereas, perceived risk (*p*-value-0.031) was found to have a negative influence on BI, while effort expectancy (*p*-value-0.858) was found to be insignificant.

In this study effort expectancy was observed to be insignificant in influencing consumers' acceptance of mobile wallet services. This result is consistent with the work of previous researchers who observed EE or PEOU as insignificant factors in predicting adoption intentions for mobile technologies (Chong, 2013; Slade et al., 2015). In the process of making any payment via a mobile wallet, consumers have to deal with issues of small screen sizes, low bandwidth and the like, creating problems for them when trying to browse easily on their mobile devices. However, with the introduction and growing penetration of smartphones with larger display sizes as well as with the introduction of speedy 3G and 4G mobile Internet connections, these issues have been eliminated to a great extent. Hence, the amount of effort needed to become skilful in using mobile phones for various purposes has consequently been reduced.

Consistent with past researches, the present study also observed that performance expectancy has a positive and significant influence on BI in respect of mobile wallet adoption. (Shin, 2009; Schierz et al., 2010; Kim et al., 2010; Wang and Yi, 2012; Thakur and Shrivastava, 2014; Yan and Yang, 2015). Mobile wallet services have made payment transactions much easier to execute by eliminating the need for the physical transfer of money or the requirement to enter into tedious processes while making bank transactions. As a result, consumers perceive mobile wallet services to be an easier and faster alternative to traditional modes of payment.

Social influence was found to be another significant factor influencing BI. This observation supports the results of previous studies conducted in the field of mobile technology adoption. (Venkatesh and Davis, 2000; Venkatesh et al., 2003; Schierz et al., 2010; Venkatesh et al., 2012; Yang et al., 2012; Slade et al., 2015). It is observed that family, friends, peer groups and virtual communities on social networking media have a substantial influence on the behaviours of people. Since such agents of social influence are perceived to have higher credibility when compared with other sources of information, any positive word-of-mouth recommendations made by these change agents prove to be greater motivators for people trying out any new technology or information system.

The value which the consumer is getting or perceives to receive in terms of additional advantages (better quality of service, additional utilities and the like) offered by mobile wallet services over the traditional payment channels, in exchange for price paid to avail such services, is also predicted to have a significant influence on consumers' intentions to adopt it (Pagani, 2004; Amoroso and Magnier-Watanabe, 2012; Venkatesh et al., 2012). In line with the findings of previous researches, the present study also validates the significant relationship of perceived value (PV) with the BI of consumers to adopt mobile wallet services.

The study validated the findings of previous research in which perceived risk and perceived trust emerged as two other important variables that have a significant influence on consumers' BI to adopt new mobile technologies. (Dahlberg et al., 2003; Wu and Wang, 2005; Shin, 2009; Xin, 2013; Pham and Ho, 2014). The mobile wallet industry is comprised of a number of stakeholders such as consumers, merchants, service providers, technology providers, as well as financial institutions. In a typical mobile wallet transaction, important personal and banking information is exchanged between the customer, a company, a telecom service provider, and a payment gateway. Any breach of trust between any of these parties increases the degree of perceived risk and lowers the degree of perceived trust. Thus, the telecom service providers and companies involved in payment processing along with financial institutions should develop multilayer security systems to minimize any risk and maximise the degree of trust perceived by consumers that are entering into a mobile wallet transaction.

The availability and non-availability of the necessary resources required for entering into a mobile wallet transaction, such as necessary knowledge, an Internet-enabled smartphone, a mobile network with a decent speed and so on, also have a significant influence on consumers' acceptance of mobile wallet services. The results of the present study are consistent with earlier studies, and confirm this relationship by establishing the significant and positive influence that facilitating conditions have on BI (Yang, 2010; Chong, 2013; Thakur and Shrivastava, 2014).

The study observed a limited awareness among mobile phone users regarding the regulatory support mechanism available in case of any dispute that arise while making any payment via a mobile wallet. It also indicates the strong influence of perceived regulatory support on the

consumer's BI to adopt a mobile wallet. Hence, efforts are needed from the government as well as other stakeholders in this industry to create enough awareness among consumers about the prevailing regulatory support that exists and steps are needed to be taken to improve the existing scenario.

It has been observed that consumers often opt for the mobile wallet as an alternative mode of making payments, not just because of the factors discussed widely above but also because of the incentives and additional promotional benefits that mobile wallets offer (Rapid Campaign Report, 2015; Brooks, 2015). This fact provides a new dimension of the mobile wallet ecosystem to consider. These incentives may be offered in the form of discount coupons which can be applied for at the time of making payments, cashback payments made to mobile wallets after transactions over and above a specified amount have been completed, or they may be offered in the form of other freebies. This study has established a positive relationship between such promotional benefits offered by mobile wallet service providers and consumers' BI to adopt mobile wallet services.

Considering the vast potential of mobile wallets, the diffusion of these services is still quite low. The findings of this study can help marketers and service providers, as well as technology-providing firms to understand the relevant antecedents of mobile payment adoption so that suitable marketing interventions can be designed to meet demand for them.

6. Limitations

The study relied on primary information collected through an online survey of 210 respondents. Thus, the sample may suffer from selection bias. Moreover, the respondents considered for this study belonged to different demographic categories in a disproportionate manner, which might have an influence on the results of the study. This study was restricted to an analysis of the impact of only nine major factors that were derived from the consumers' points of view, ignoring other crucial aspects of the mobile wallet industry which might influence adoption intentions. There are many other important consumer-related factors such as perceived enjoyment, personal innovativeness, cost etc., which may be investigated in future studies to understand the BI to adopt mobile wallets better. The success or failure of the mobile wallet industry depends on all the elements of this ecosystem, i.e. the stakeholders involved. Consumers being only one crucial element of it, other stakeholders such as mobile wallet service providers, merchants, technology providers and financial institutions, as well as government, have an equal role to play in improving the adoption rate of this industry.

References:

Ajzen, I. (1991), "The theory of planned behaviour", *Organizational Behaviour and Human Decision Processes*, Vol.50, No.2, pp.179–211.

Agarwal, R., & Prasad, J. (1999), "Are individual differences germane to the acceptance of new information technologies?", *Decision Sciences*, Vol.30, No.2, pp. 361-391.

Akturan, U., & Tezcan, N. (2012), "Mobile banking adoption of the youth market: Perceptions and Intentions", *Marketing Intelligence & Planning*, Vol.30, No.4, pp. 444-459.

Amoroso, D. L., & Magnier-Watanabe, R. (2012), "Building a research model for mobile wallet consumer adoption: the case of Mobile Suica in Japan", *Journal of theoretical and applied electronic commerce research*, Vol. 7, No.1, pp. 94-110.

Alqahtani, M. A., Al-Badi, A. H., & Mayhew, P. J. (2012), "The Enablers and Disablers of E-Commerce: Consumers' Perspectives", *The Electronic Journal of Information Systems in Developing Countries*, Vol54, No. 1, pp. 1-25.

Alshamaila, Y., Papagiannidis, S. & Li, F. (2013), "Cloud Computing Adoption by SMEs in the North East of England: A multi-perspective framework", *Journal of Enterprise Information Management*, Vo. 26, No. 3, pp. 250–275.

AlGhamdi, R., Nguyen, A., & Jones, V. (2013), "A study of influential factors in the adoption and diffusion of b2c e-commerce", *International Journal of Advanced Computer Science and Applications*, Vol. 4, No.1, pp. 89-94.

Agarwal, S. (2016, April 28), "Initial euphoria of prepaid wallets dies down", The Economic Times, Available at: http://economictimes.indiatimes.com/industry/banking/finance/initial-euphoria-of-prepaid-wallets-dies-down/articleshow/52017962.cms. (Accessed on 20th May 2016)

Bossuyt, M. & Hove, L. (2007), "Mobile payment models and their implications for NextGen MSPs", *info*, Vol. 9, No. 5, pp. 31-43.

Bigcommerce.com. (2015), "What are promotional codes and how do they work?", Available at: https://www.bigcommerce.com/ecommerce-answers/what-are-promotional-codes-and-how-do-they-work/ (Accessed on 18th May 2016)

Brooks, R. (2015), "Do Promotions really increases your e-commerce conversion rates?", Available at: http://blog.lemonstand.com/promotions-increase-ecommerce-conversion-rates/ (Accessed on 18th May 2016)

Baidya, A. (2016, March 3), "PayTM, Freecharge And Mobikwik: The Dawn of Mobile Wallet Apps in India [REPORT]", Dazeinfo.com, Available at: http://dazeinfo.com/2016/03/03/paytm-freecharge-mobikwik-mobile-wallet-apps-india/. (Accessed on 20th May 2016)

Cheong, J. H., Park, M. C., & Hwang, J. H. (2004), Mobile payment adoption in Korea: Switching from credit card, In *ITS 15th Biennial Conference,* Berlin, Germany, pp. 4-7.

Chong, A. Y. L., Chan, F. T. S. and Ooi, K. B. (2012). "Predicting consumer decisions to adopt mobile commerce: cross-country empirical examination between China and Malaysia", *Decision Support System,* Vol.53, No. 1, pp. 34-43.

Chong, A. Y. L. (2013), "A two-staged SEM-neural network approach for understanding and predicting the determinants of m-commerce adoption", *Expert Systems with Applications*, Vol. 40, No.4, pp. 1240-1247.

Chong, A. Y. L. (2013), "Predicting m-commerce adoption determinants: A neural network approach", *Expert Systems with Applications*, Vol.40, No.2, pp. 523-530.

Chandran, P. (2016, March 6), "Tech-savvy Indians shop with 'cashless' wallets", *The Hindu*, Available at: http://www.thehindu.com/business/Industry/techsavvy-indians-shop-with-cashless-wallets/article8320850.ece. (Accessed on 21st May 2016)

Davis, F. D. (1989), "Perceived usefulness, perceived ease of use, and user acceptance of information technology", *MIS Quarterly*, Vol. 13, pp. 319–339.

Dahlberg, T., Mallat, N., & Öörni, A. (2003), "Trust enhanced technology acceptance model consumer acceptance of mobile payment solutions: Tentative evidence", *Stockholm Mobility Roundtable*, pp. 22-23.

Duncombe, R., & Boateng, R. (2009), "Mobile Phones and Financial Services in Developing Countries: a review of concepts, methods, issues, evidence and future research directions", *Third World Quarterly*, Vol. 30, No.7, pp. 1237-1258.

Dennehy, D., & Sammon, D. (2015), "Trends in mobile payments research: A literature review", *Journal of Innovation Management*, Vol. *3*, No. 1, pp. 49-61.

Dhanorkar, S. (2016, April 18), "All you need to know about mobile wallets", The Economic Time, Available at: http://economictimes.indiatimes.com/wealth/spend/all-you-need-to-know-about-mobile-wallets/articleshow/51852224.cms. (Accessed on 20th May 2016)

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

Gong, W., & Li, Z. G. (2008), "Mobile Youth in China: A cultural perspective and marketing implications", *International Journal of Electronic Business*, Vol. 6, No.3, pp. 261–81.

Haque, A., Tarofder, A. K., Rahman, S., & Raquib, M. A. (2009), "Electronic transaction of internet banking and its perception of Malaysian online customers", *African Journal of Business Management*, Vol. *3*, No. 6, pp. 248.

Hanafizadeh, A., Behboudi, M., Koshksaray, A.A. and Tabar, M.J.S. (2014), "Mobile-banking adoption by Iranian bank clients", Telematics and Informatics, Vol. 31, No. 1, pp. 62-78.

Keeney, R. L. (1999), "The value of Internet commerce to the customer", *Management Science*, Vol. 45, No.4, pp. 533-542.

Kim, C., Mirusmonov, M., & Lee, I. (2010),"An empirical examination of factors influencing the intention to use mobile payment", *Computers in Human Behavior*, Vol. 26, No.3, pp. 310-322.

Kuganathan, K.V.and Wikramanayake, G.N. (2014), "Next Generation Smart Transaction Touch Points", In *International Conference on Advances in ICT for Emerging Regions (ICTer)*, pp.096 – 102.

Lawshe, C. H. (1975), "A quantitative approach to content validity1", *Personnel Psychology*, Vol. 28, No.4, pp. 563-575.

Lee, C. P., Warkentin, M., & Choi, H. (2004), "The role of technological and social factors on the adoption of mobile payment technologies", In *AMCIS 2004 Proceedings*, pp. 333.

Leavitt, N., 2012, "Are mobile payments ready to cash in yet?", *Computer*, (9), pp.15-18.

Liébana-Cabanillas, F., Sánchez-Fernández, J., & Muñoz-Leiva, F. (2014), "Antecedents of the adoption of the new mobile payment systems: The moderating effect of age", *Computers in Human Behavior*, Vol. *35*, pp. 464-478.

McMaster, T., & Wastell, D. (2005), "Diffusion or delusion? Challenging an IS research tradition", *Information Technology & People*, Vol. 18, No. 4, pp. 383–404.

Pagani, M. (2004), "Determinants of adoption of third generation mobile multimedia services", *Journal of interactive marketing*, Vol. 18, No. (3), pp. 46-59.

Pham, T. T. T., & Ho, J. C. (2014), "What are the core drivers in consumer adoption of NFC-based mobile payments?: A proposed research framework", In *Management of Engineering & Technology (PICMET), 2014 Portland International Conference,* pp. 3041-3049.

Roger, E.M. (1995), *Diffusion of Innovations*, New York: The Free Press.

Riquelme, H. E., & Rios, R. E. (2010), "The moderating effect of gender on the adoption of mobile banking", *International Journal of Bank Marketing*, Vol.28, No.5, pp. 328-341.

Rapid Campaign Report. (2015), "Brands we love versus brands we buy", Available at: http://resources.rapidcampaign.com/acton/media/9661/brands-we-love? (Accessed on 18th May 2016)

Yadav, R., Sharma, S. K., & Tarhini, A. (2016), "A multi-analytical approach to understand and predict the mobile commerce adoption", *Journal of Enterprise Information Management*, Vol.29, No.2, pp. 222-237.

Shin, D. H. (2009),"Towards an understanding of the consumer acceptance of mobile wallet", *Computers in Human Behavior*, Vol. 25, No.6, pp. 1343-1354.

Schierz, P. G., Schilke, O., & Wirtz, B. W. (2010), "Understanding consumer acceptance of mobile payment services: An empirical analysis", *Electronic Commerce Research and Applications*, Vol. 9, No.3, pp. 209-216.

Slade, E., Williams, M., Dwivedi, Y., & Piercy, N. (2015), "Exploring consumer adoption of proximity mobile payments", *Journal of Strategic Marketing*, Vol. *23*, No. 3, pp. 209-223.

Singh, A. (2016, March 10), "The future of mobile wallets in India", The Hindu Business Line, Available at: http://www.thehindubusinessline.com/catalyst/the-future-of-mobile-wallets-in-india/article8332085.ece. (Accessed on 20th May)

Shen, S. (2015, May 18), "Report Highlight for Market Trends: Mobile Payment — The Way Forward", *Gartner*, Available at:

https://www.gartner.com/doc/3055223?srcId=1-2819006590&cm_sp=gi-_-rr-_-top. (Accessed on 21st May 2016)

Statista, (2016), "Global mobile payment transaction volume from 2015 to 2019 (in billion U.S. dollars)", Available at: http://www.statista.com/statistics/226530/mobile-payment-transaction-volume-forecast/. (Accessed on 21st May)

Tornatzky, L. and Fleischer, M. (1990), *The process of technology innovation*, Lexington Books, Lexington, MA.

Tsu Wei, T., Marthandan, G., Yee-Loong Chong, A., Ooi, K. B., & Arumugam, S. (2009), "What drives Malaysian m-commerce adoption? An empirical analysis", *Industrial Management & Data Systems*, Vol. 109, No.3, pp. 370-388.

Tan, G. W. H., Ooi, K. B., Persiaran, U. T. L., & Teknologi, B. U. (2013), "Mobile Tourism the Hidden Jewel of the Tourism Industry?", In *Diversity, Technology, and Innovation for Operational Competitiveness: Proceedings of the 2013 International Conference on Technology Innovation and Industrial Management*, Phuket, Thailand, pp. S6_1-14.

Thakur, R., & Srivastava, M. (2014), "Adoption readiness, personal innovativeness, perceived risk and usage intention across customer groups for mobile payment services in India", *Internet Research*, Vol. 24, No.3, pp. 369-392.

Venkatesh, V., & Davis, F. D. (2000), "A theoretical extension of the technology acceptance model: Four longitudinal field studies", *Management Science*, Vol. 46, No.2, pp. 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*, Vol. 27, No. 3, pp. 425-478.

Van Raaij, E. M., & Schepers, J. J. (2008), "The acceptance and use of a virtual learning environment in China", *Computers & Education*, Vol. 50, No.3, pp. 838-852.

Venkatesh, V. & Bala, H. (2008), "Technology acceptance model 3 and a research agenda on interventions", *Decision science*, Vol. 39, No.2, pp. 273-315.

Venkatesh, V., Thong, J., & Xu, X. (2012), "Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology", *MIS Quarterly*, Vol. 36, pp. 157–178.

Wu, J. H., & Wang, S. C. (2005), "What drives mobile commerce?: An Empirical evaluation of the revised technology acceptance model", *Information & Management*, Vol. 42, No.5, pp.719-729.

Wu, M. Y., Chou, H. P., Weng, Y. C., & Huang, Y. H. (2008), "TAM-2 based study of website user behavior-using web 2.0 websites as an example", *WSEAS Transactions on Business and Economics*, Vol. 4, No.8, pp. 133-151.

Wang, L., & Yi, Y. (2012), "The impact of use context on mobile payment acceptance: An empirical study in China", *Advances in computer science and education*, Springer Berlin Heidelberg, pp. 293-299.

Williams, M., Rana, N. & Dwivedi, Y. (2015), "The unified theory of acceptance and use of technology (UTAUT): a literature review", *Journal of Enterprise Information Management*, Vol. 28, No.3, pp. 443-488.

Xin, H. (2013), "Exploring the influence of trust and culture on mobile payment adoption", *Doctoral dissertation, Auckland University of Technology*, Auckland.

Yang K. (2010),"Determinants of US consumer mobile shopping services adoption: implications for designing mobile shopping services", *Journal of Consumer Marketing*, Vol. 27, No. 3, pp. 262 – 270.

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

Yan, H., & Yang, Z. (2015), "Examining Mobile Payment User Adoption from the Perspective of Trust", *International Journal of u-and e-Service, Science and Technology*, Vol. 8, No.1, pp. 117-130.

Zeithaml, V. A. (1988), "Consumer perceptions of price, quality, and value: a means-end model and synthesis of evidence", *The Journal of Marketing*, vol. 52, no. 3, pp. 2-22.

Zhu, L. (2009), "Legal and policy environments: An institutional perspective of global e-commerce adoption", *System Sciences, 2009. HICSS'09. 42nd Hawaii International Conference,* pp. 1-10. IEEE.

Zhang, L., Zhu, J., & Liu, Q. (2012), "A meta-analysis of mobile commerce adoption and the moderating effect of culture", *Computers in Human Behaviour,* Vol. 28, No.5, pp. 1902-1911.

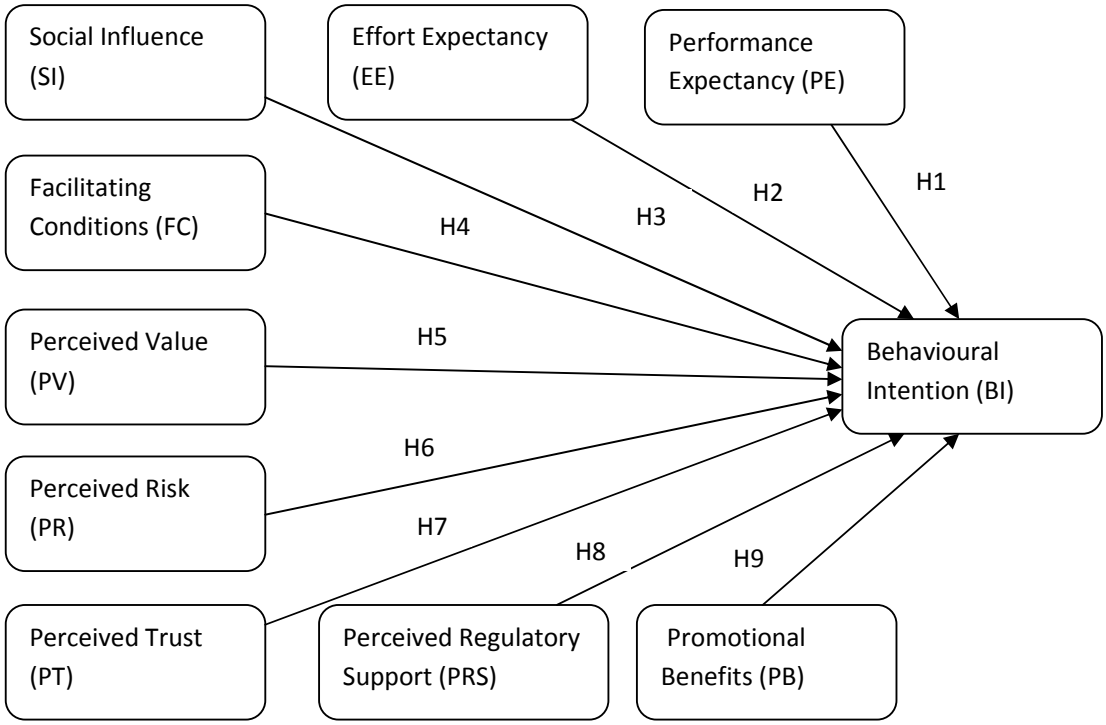

Figure 1: Conceptual Model

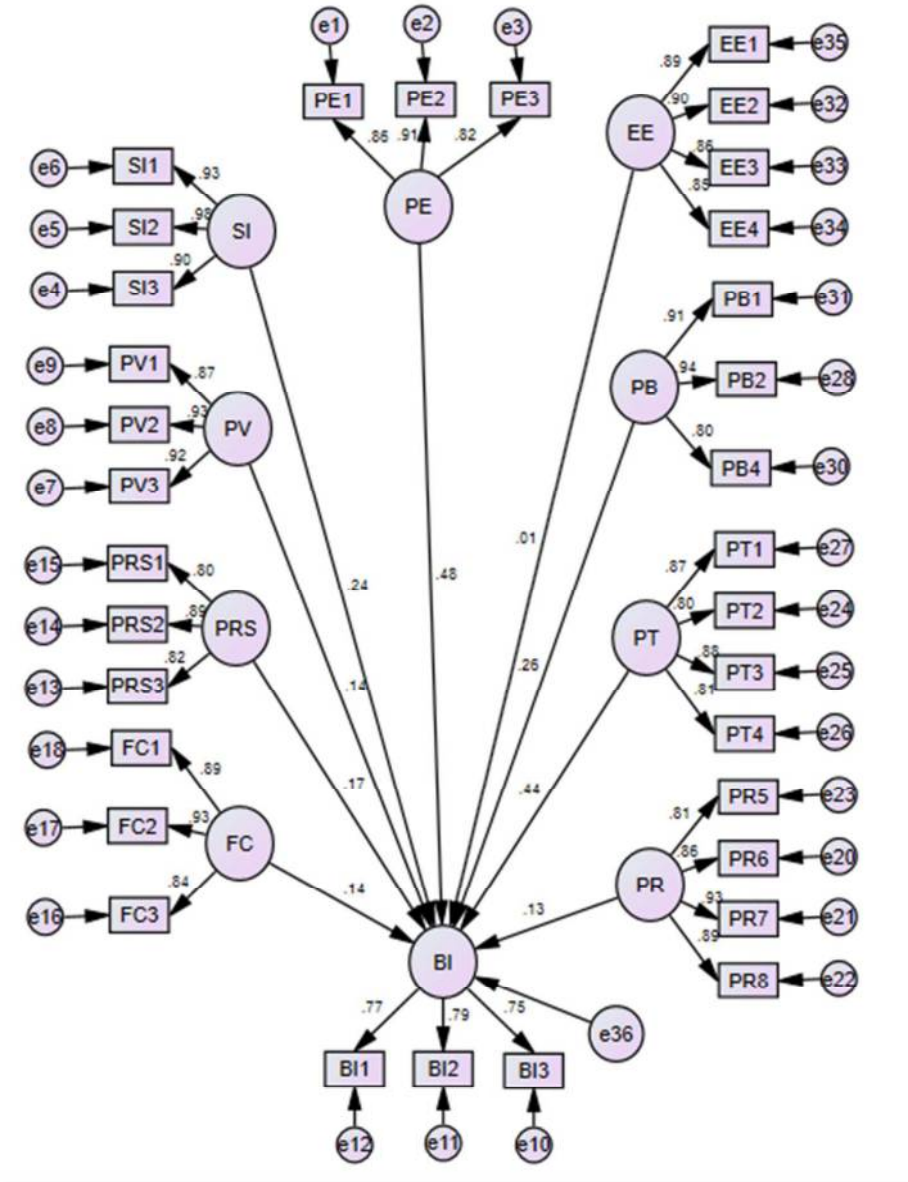

Figure 2: Structural Model constructed using AMOS with Standardised Estimates

Table 1: Demographic Analysis

Sample Characteristics	Frequency (n=210)	Percent (%)
Age:		
Less than 20 years	2	1
20- 30 Years	171	81.4
30-40 Years	27	12.9
40-50 Years	7	3.3
Above 50 Years	3	1.4
Gender:		
Male	166	79.1
Female	44	20.9
Education:		
High School	1	0.5
Graduate	75	35.7
Post Graduate	134	63.8
Family Income per annum:		
Less than Rs. 2 lakhs	11	5.2
Rs. 2 lakhs to Rs. 5 lakhs	33	15.7
Rs. 5 lakhs to Rs. 8 lakhs	70	33.3
Rs. 8 lakhs to Rs. 11 lakhs	35	16.7
Above Rs. 11 lakhs	61	29.1

Table 2: Overall fit indices for Measurement Model

Model Elements	Values
C-Min	780.64
Degrees of Freedom(d.f.)	448
C-Min / d.f.	1.743
Root Mean Square Error of Approximation (RMSEA)	0.06
Comparative Fit Index (CFI)	0.951
Normalised Fit Index (NFI)	0.893
Goodness-of-fit Index (GFI)	0.825

Table 3: Reliability & Validity

Factors	Cronbach's alpha	AVE	MSV	ASV
Performance Expectancy (PE)	0.892	0.772	0.663	0.420
Effort Expectancy (EE)	0.929	0.765	0.618	0.376
Social Influence (SI)	0.954	0.878	0.444	0.290
Facilitating Conditions (FC)	0.844	0.786	0.412	0.240
Perceived Value (PV)	0.936	0.831	0.651	0.426
Perceived Risk (PR)	0.928	0.741	0.100	0.049
Perceived Trust (PT)	0.907	0.699	0.696	0.411
Perceived Regulatory Support (PRS)	0.876	0.704	0.466	0.292
Promotional Benefits (PB)	0.908	0.785	0.446	0.277
Behavioural Intention (BI)	0.912	0.776	0.696	0.464

Table 4: *p*-value of constructs

Constructs	PE	EE	SI	FC	PV	PR	PT	PRS	PB
***p*-value**	<0.001	0.858	<0.001	0.021	0.15	0.031	<0.001	0.005	<0.001
β	0.48	0.01	0.24	0.14	0.14	0.13	0.44	0.17	0.26