Analysis of Factors Affecting Intent to Use Mobile Commerce Services in India

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ABSTRACT

India seems to lead the shift from e-commerce to mobile commerce adoption. Apps and mobile websites are offered in various areas of health, travel, shopping, ticketing, and lifestyle, promising enormous opportunities for consumers and businesses. This study identifies the critical factors affecting m-commerce transaction decisions and explaining their relevance. The significant moderating effect of demographics and types of mobile commerce services, namely banking, ticket booking, and shopping services, are analyzed on users' behavioral intention in a single framework. The data collection done through questionnaire required the respondents to describe their behavior during their most recent online transactions in terms of UTAUT model dimensions in three specific areas: m-banking, m-ticketing, and m-shopping. Structured equational modeling was employed to analyze the causal association between variables. The research implications will help in understanding the factors affecting the acceptance levels of various m-commerce services by the consumers in India.

KEYWORDS

Effort Expectancy, Facilitating Conditions, M-Banking, M-Commerce Services, M-Ticketing, Performance Expectancy, Social Influences, Unified Theory of Acceptance, Use of Technology Model

INTRODUCTION

In India, growth in the Internet user base is supplemented by substantial growth in smartphone usage (Kalia, Kaur, & Singh, 2018; Poushter, 2016). Internet user base in India is predicted to cross 627 million by the year 2020 (Kantar IMRB, 2020). With mobile device as the new constant companion, customers are using mobiles to exchange emails/pictures/videos, download music/animations/graphics, shop for merchandise, play online games, access health and lifestyle apps, access Global Positioning System data, perform stock transactions, book tickets, discover companions, conduct monetary transactions, manage banking transactions, pay via mobile phone credit payment and purchase from vending machines etc. (Ahuja, 2018; AlHinai, Kurnia, & Johnston, 2007). Almost 94% of the Indian population use mobile phones for personal and professional reasons. This paradigm shift has led to immense market potential among Indian masses for adopting mobile commerce (or m-commerce) (Madan & Yadav, 2018; Bhullar & Gill, 2018).

M-commerce or mobile commerce is described as “any transaction with monetary value that is conducted via a mobile telecommunications network” (Müller-Veerse, 2000, Sadeh, 2003). Mobile

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commerce enables online transactions via wireless handheld devices. Reasons for significant growth in the mobile commerce arena are attributed to increased investment in funding mobile start-ups, improved infrastructure and technology, and better devices. By 2020, the Internet economy is predicted to touch USD 200 billion and will contribute 5% of GDP. Another research by eMarketer (2019) found that by 2021, sales resulting from m-commerce could account for approximately 54% of overall e-commerce sales. As per Statistica (2019), m-commerce sales in India is predicted to be valued at USD 38 billion by 2020. Although there has been significant growth in m-commerce since 2015, percentage of m-commerce is not aligned with smartphone density and mobile internet in the country.

With increased usage and inclination of users towards digital networks, mobile commerce services have witnessed high growth and acceptance in India. Government is coming up with several measures and initiatives to promote the use of digital platforms by consumers, and achieve financial inclusion goals of the Government of India (Singh, 2018). These services help consumers to avail all banking services in one app and access these services anywhere and anytime without visiting the physical bank branch (Singh et al., 2020). M-commerce services are attracting users to adopt services such as mobile payments, mobile banking, online shopping, other daily services, at their convenience (Tan et al., 2018). M-commerce in itself opens several challenges related to new value for consumers, technological infrastructure, business models and value chain (Zeeshan, Cheung, & Scheepers, 2007, Upadhyay and Jahanyan, 2016). This depends on many factors related to the overall mobile web or app experience. Unprofessionally designed mobile web experiences lead to losing customers due to navigation issues, small images, security concerns and checkout processes. Moreover, customers have concerns related to recent data breaches, data privacy and protection, cost of data usage, difficulty in adding discount codes, mobile website speed, and incorrect clicking of buttons due to wrong precision. The use of mobiles to perform shopping leads to immense dynamicity in the marketplace pertaining to products and prices. Although cost is the most agreed criteria for purchase, today’s consumer arrives at purchasing decisions with a broad range of expectations on different fronts.

Since sales through mobile phones are not very high, it calls for study to understand the reasons for customer online experiences that create stumbling blocks in getting more business from mobile shopping (Jarvenppa, 2003; Mylonopoulos et al., (2003); Chipchase, 2005; Okazaki, 2005). The study is more relevant in the Indian context since e-commerce and m-commerce are the only gateways for small sellers to increase visibility and reach a wider audience. As per KPMG (2019) report, Indian SME’s contribute about twenty-two percent of the GDP. In addition, twenty-seven percent of Indian SME’s have e-commerce presence. Government of India is also encouraging businesses to adopt digital platform and has initiated many schemes such as Digital India. As per Goldman Sachs, 2016, adopting digital platforms has reduced SMEs’ distribution and marketing cost by sixty percent.

The study conducts a detailed analysis of consumer acceptance levels of mobile website experience. This paper investigates customers’ experience towards online transactions so that limiting factors and barriers in online transactions can be identified and minimized to engage customers in a much better way for mobile commerce. The results will extend the relationship with moderating effect of usage (banking services, ticket booking services, shopping), other demographic traits of users such as gender, age and education, between independent and dependent variables (Thakur & Srivastava, 2014; Tan & Ooi, 2018; Liébana-Cabanillas et al., 2018). This analysis attempts to analyse the impact of these variables on users’ behavioural outcome.

This section introduces the topic of research. Section 2 gives a detailed literature review and introduction to existing models for m-commerce acceptance. Section 3 explains the research methodology for conducting the empirical study. Section 4 discusses various factors that may influence acceptance among students and staff members of colleges. Section 5 addresses limitations of this study and proposes directions for future research.
REVIE W O F LITERATURE

With adoption of modern technology or services, researchers have used and tested several effective models including the technology acceptance model (TAM), social cognitive theory; innovation diffusion theory (IDT), theory of planned behaviour, unified theory of acceptance, theory of reasoned actions (TRA) and use of technology (UTAUT) model etc. (Dahlberg et al., 2015; Singh et al., 2017, 2020). They have been used in various contexts such as perspectives of individuals, groups, organizations etc. towards the use of new technology for various purposes (Venkatesh et al., 2003; Slade et al., 2015; Gupta, 2018; Kizgin et al., 2018). Out of all such theories, UTAUT has been found most inclusive and effectual in terms of assessing practical and behavioural aspects of technology adoption (Madan & Yadav, 2016; Tandon et al., 2016). UTAUT model was first developed by Venkatesh et al., (2003) and constituted four main determinants: performance expectancy, effort expectancy, social influence and facilitating conditions, along with demographics, as moderators. The original UTAUT model was found very relevant in previous academic literature to predict behaviour of users towards a new technology (Yu, 2012, Foon & Fah, 2011; Gupta, Dogra & George, 2018). They confirmed that behavioural intention is impacted by functional attributes of technology including performance expectancy and effort expectancy; social influence measures the perception of society and its impact on an individual’s behavioural intention (Tajvidi et al., 2017; Madan and Yadav, 2018). On the other hand, facilitating conditions were found relevant and majorly impact use of a technology (Venkatesh et al., 2003; Venkatesh et al., 2012). This dimension has not been included in earlier studies which evaluated behavioural intention of a user (Shin, 2009). UTAUT is perceived appropriate and better than TAM model, since it can explain both technical and behavioural aspects associated with the technology (Shaw, 2014). Moreover, for advanced and complex services like mobile commerce (Singh et al. 2020), UTAUT model is considered more relevant as compared to other technology adoption models, including TAM (Slade et al., 2015; Duarte et al., 2018).

After many years, Venkatesh et al. (2012) proposed UTAUT2 and three new constructs namely, price, habit and hedonic motivation. This model explained 70 percent of variance to predict user’s behavioural intention to adopt new technology. However, both the models were originally tested in the organizational context but later was found equally significant to measure intention of an individual user (Venkatesh et al., 2012). A large number of studies prepared consumer behavioural models by including UTAUT, UTAUT2, several extensions of UTAUT models etc., and found them very relevant and valid (Shaw, 2014; Singh et al., 2017). These extensions have been proposed based on user’s needs, characteristics and demographics (Alalwan et al., 2017). Also, a few extensions have been proposed in the context of challenges and issues in developed and emerging economies (Tandon et al., 2016; Gupta, 2018). It is found that social influence is multi-dimensional and impacted by various factors (Singh et al., 2017; Kizgin et al., 2018). In addition, performance and effort expectancy are also influenced by several other dimensions and have been included in various studies in the context of India and other countries (Slade et al., 2015; Singh et al., 2020). Some such extensions are: perceived security, innovativeness, stress, perceived satisfaction, trust, perceived benefits, attitude (Slade et al., 2015; Shaw, 2014). Another dimension is perceived risk (disturbing concerns). Perceived risk is used in several past researchers (Muñoz-Leiva et al., 2017), a few in the context of India (Madan & Yadav, 2016; 2018; Singh et al., 2020). There are several significant studies, where UTAUT was extended with perceived risk (Kapoor et al., 2013; Shaw, 2014; Liébana-Cabanillas et al., 2018) which was found very relevant for acceptance of new technology. As m-commerce is a very new and advanced technology, users are susceptible to privacy and security issues (Venkatesh et al., 2003; Slade et al., 2015). In addition, one of the features of mobile communication use is that the mobile device’s current location can be easily identified. This feature can be utilized for providing a personalized experience and better potential for location-based applications and services. However, it poses privacy and security concerns and hence affects customer trust and, in turn, intention to use m-commerce (Taherdoost, 2017; Singh, 2017). Thus, it is important to consider these issues among
disturbance concerns for the customer. Using existing literature, the study has shown that the above variables influence m-commerce usage by online users. For India, with low literacy levels of people and low awareness about use of technology, perceived risk is crucial (Singh et al., 2017). The impact of perceived risk is high due to low awareness related to technology use.

We have found studies where extensive use is made of disturbance concerns (perceived risk) (Slade et al., 2015; Duarte et al., 2018; Liébana-Cabanillas et al., 2018), majorly in developed country contexts or in general (Liébana-Cabanillas et al., 2014, 2017, 2018). Moreover, despite the rapid proliferation of m-commerce services, very few significant studies are available in the context (Ngai & Gunasekaran, 2007). We have inadequate studies available where usage of mobile-based commerce services including banking, ticket booking and shopping, is discussed in detail in the context of India. The present study fills this gap.

HYPOTHESES DEVELOPMENT

Performance and Effort Expectancy

Performance expectancy (PE) is the user’s perception that adoption of technology will result in enhanced job performance. Effort expectancy (EE) is the user’s conviction that information technology is easy to learn and operate. In the m-commerce perspective, EE is the user perception that transaction and navigation through m-commerce application or site is a simple activity to learn and use. Several types of researches have validated the positive relationship between EE and system being perceived as useful by consumers (Govender & Sihlali, 2014; Kazemi et al., 2013). As per (Barkhi and Wallace, 2007), if the e-commerce site is observed to be convenient for shopping including navigation and payments, customers will engage more with the site. In empirical studies based on consumer adoption of m-banking services (Tam and Oliveira, 2016; Riffai, Grant & Edgar, 2012), PE was found a significant determinant. PE implies that the consumer recognizes and appreciates advantages in adopting mobile banking facility. As per Grant & Edgar (2012), PE was identified as a significant determinant affecting intention to adopt m-banking facility. It leads to consumers’ belief that using technology enhances efficiency in jobs.

H1: PE and EE have significant and direct impact on behavioural intention of a user in adopting the technology.

Social Influence (SI)

The impact of SI on human behaviour, particularly in adoption of technology, has been extensively studied (Triandis, 1980; Venkatesh et al., 2003; Zhou & Wang, 2010). The role of SI has been widely recognised in technology adoption research, using approaches such as TPB (Ajzen, 1991), UTAUT (Venkatesh and Davis, 2000). Subjective norms recognise SI as perceived social pressure to adopt new technology. Empirical studies have used SI as a moderator to measure the impact on consumer’s attitudes and intentions for technology adoption (Shaw, 2014; Lin et al., 2007). Behaviour and buying patterns of people are generally influenced by peer group, family members, friends and society, as they value their opinion (Wang & Chou, 2014). Researches also validated the role of SI on m-payments perspective (Zhou and Wang, 2010; Madan & Yadav, 2018; Duarte et al., 2018). SI affects values and beliefs of consumers (Liu 2016; Karjaluo et. al., 2018; Tan & Ooi, 2018). Shen et al., 2013 tested the concept of consumers’ collective intentions with respect to technology adoption. Innovation diffusion theory, conceptualised by Rogers (1995), defined SI in terms of image building, wherein the use of new technology is believed to increase one’s social status. This point of view was found to be positively related, to hypothesise:

H2: SI has a direct impact on behavioural intention of a user adopting the technology.
**Disturbance Concern**

As the study is based on investigating disturbance concern associated with mobile shopping, ticketing and banking, the construct includes privacy problems, system inaccuracies, forgetting/losing passwords, incompatibility with respect to security software and payment gateways. Hanafizadeh et al., (2014) specified that risk factors are critical in mobile services; the more the risk of using new technology, less is the inclination to buy. Perceived risk (PR) is conceived as a threat or insecurity while using technology-based service (Yang, Liu & Ding, 2012). Researchers have widely discussed PR as a principal construct in determining behavioural intention of users.

Disturbance concern includes privacy risk wherein the user perceives threat of unauthorized acquisition of personal information during e-shopping. Owing to PR, people tend to be apprehensive in providing personal data to web providers (Hoffman et al., 1999). As per George, (2002), fear of invading privacy of personal information was found to be positively related to negative attitudes toward web commerce. Consumers recognised perceived risk as a key constraint for online and mobile transactions (Passyn, Diriker & Settle, 2011). Lack of experience also makes payment through mobile services appear more risky to consumers (Gefen & Straub, 2003). Masoud, (2013), established that consumers have apprehension about online shopping because they have anxiety about trailing their credit card details. On the basis of above argument, the following hypothesis is proposed:

H3: Disturbance concern has a negative impact on behavioural intention of a user adopting the technology.

**DEMOGRAPHIC VARIABLES AS MODERATORS**

**Age as Moderator**

Age is the most studied demographic variable in e-shopping literature (Chang, Cheung, and Lai, 2005). Empirical studies established a negative association between higher consumer age and adoption of online shopping (Joine, Scherer and Scheufele, 2003). Older consumers appreciate the hospitality and staff assistance offered in physical shopping, consumer experiences more hedonic benefit in traditional store-based shopping as compared to young consumers (Dholakia and Uusitalo, 2002). Another prominent reason cited for less inclination in online shopping by older consumers is less expertise in computers (Wagner, Schramm-Klein & Steinmann, 2017). This leads to higher computer anxiety and lower self-efficacy, and consequently less probability of preferring shopping online. As per Agwu & Murray (2014), the younger generation has fewer inhibitions and concerns in using e-commerce technology.

H4: Age moderates the impact of performance and EE, SI and DC on behavioural intention of a user adopting the technology.

**Gender as Moderator**

Previous studies measuring the impact of gender on preference to shop online have shown that males are more inclined to conduct online transactions as compared to females. (Kim and Kim, 2004; Koyuncu and Lien, 2003). A study by Chang, Cheung and Lai (2005), on e-commerce, affirms that males prefer online purchase. Rodgers and Harris (2003) indicated that males are more comfortable with online shopping, as they are more technology-oriented. Some other studies have reported no significant effect of gender on online shopping intention; however, these studies are restricted to apparel shopping (Goldsmith and Flynn, 2005). Studies have also cited gender differences related to risk sensitivity (Dholakia and Chiang, 2003). As per a recent study, m-shopping is popular among
both genders; however, purchases of males were found higher on mobile devices as compared to females (45% vs. 34%) (Ecommerce-platforms 2016).

H5: Gender moderates the impact of PE and EE, SI and DC on behavioural intention of a user adopting the technology.

Education as moderator

As per Akhter’s (2002) study, educated, younger males have more inclination for online shopping. Some subsequent studies (Sultan & Uddin, 2011, Bhatnagar & Ghose, 2004) also validated the influence of education on internet use and pointed out training and education as a major determinant. Other studies supported the argument that technical education and experience promote better use of Information Technology for varied tasks including hedonic and utility tasks (Losh, 2003). Researches validated that primarily electronic shoppers are men, having high incomes and those who have completed formal education (Dholakia and Uusitalo, 2002, Vrechopoulos et al., 2001). However, there were also instances of contradictory findings; as per Dahiya, (2012), education is not a significant determinant of online shopping.

H6: Education moderates the impact of PE and EE, SI and DC on behavioural intention of a user adopting the technology.

Types Of M-Commerce Services As Moderators

Increasing use of mobile-based technology and high penetration of mobile phones lead to enormous increase in the scope of m-commerce services in an emerging country like India. This scope of mobile-based customer service facilities lies in various domains such as banking services, mobile marketing services for example, mobile-based shopping and mobile-based ticketing services (Zolkepli & Kamarulzaman, 2015). These services are used by consumers and gradually getting absorbed into the lives of users. However, user’s expectations and experiences can vary with use of different types of m-commerce services (Singh et al., 2017).

Users’ preferences and expectations change based on the type of m-commerce services used (Vuković et al., 2019). For example, while using banking services, the user is more worried about privacy and trust issues (Pejić, 2020). Singh et al., (2017) stated that since banking services involve financial dealing and plenty of fund transfers, the user prefers a system that guarantees security of personal and financial data while doing a transaction. Another study by Daka & Phiri (2019) indicated that social influence was not significant to adoption of m-banking services. This was in contrast to the findings of Huang and Kao (2015), Mborokoh (2015), who observed social influence to be a significant predictor of adoption of m-banking services. Hence, the present study proposes:

H7: Mobile-commerce-based banking services moderate the influence of various constructs such as ease of use, social influences and disturbance concerns, on behavioural intention of a user.

On the other hand, while using mobile ticket booking, the user is more concerned about accessibility of the offers, convenience in using a service and reviewing existing feedback of websites. The study by Giao (2020) found that convenience in terms of time savings and solving their urgent need to travel were the most sought-after criteria for adoption. Similar research by Tan & Ooi (2018) confirmed that the user is more concerned about usability of service than privacy, while using mobile tourism services. Hence, the study proposes the following hypothesis:
H8: Mobile-commerce-based ticket booking services moderate the influence of various constructs such as ease of use, social influences and disturbance concerns, on behavioural intention of a user.

Tak & Panwar (2017) indicated that facilitating conditions such as discount coupons, play a key role in influencing consumers’ behavioural intention to use mobile shopping services. In addition, Hsu et al., (2010) reported that users review existing online feedbacks and consult others before using mobile shopping services. Hence the role of social influence is high in this scenario (Blaise, Halloran, & Munick, 2018). However, Soni (2019) did not report the role of social influence as an important predictor for use of mobile shopping. Hence, the present study proposes the following hypothesis:

H9: M-commerce based shopping services moderate the influence of various constructs such as ease of use, social influences, and disturbance concerns, on user’s behavioural intention.

Conceptual Framework

Figure 1 explains all the proposed relationships between the variables used to predict behavioural intention of users.

RESEARCH METHODOLOGY

Scale development

A five-point Likert-scale, with 1 denoting strongly disagree to 5 denoting strongly agree, was used to collect responses for various scales. Performance and effort expectancy combined scale, and social influences scale were based on the UTAUT scale which was developed by Venkatesh et al., (2012). Disturbance concerns scale was adopted from Madan & Yadav (2016). Finally, behavioural intention scale was adopted from Singh et al., (2017).

The questionnaire was divided into two categories. The first category included questions related to the scales used in the study. A few questions related to demographic information of respondents such as user’s gender, age, income, occupation status, education etc., were included in the next category.
The study also included information about the usage of different categories of mobile commerce services such as banking, ticket booking, traveling and shopping (Wu et al., 2017).

**Data Collection**

The respondents belong to Delhi NCR (National Capital Region) in India, which is considered an information system hub, offering various mobile commerce services. We chose the sample of NCR region because it is the world’s largest urban cluster, which has people with diverse socioeconomic backgrounds from all over India (Statista, 2018). Pilot testing was conducted with 70 respondents to check reliability and appropriateness of the scales. Items having loadings less than 0.5 and high correlations of more than 0.9 were removed. After checking errors and reliability, final questionnaires were sent to 410 consumers belonging to various regions in Delhi and NCR, in the month of January 2019, following an online convenience sampling procedure. A follow-up email was sent after four weeks to the first survey mail to all the respondents who had not responded yet. Finally, in the month of April, we received total of 275 responses out of which a total of 254 complete forms were included for analysis. A descriptive instruction message was sent to the respondents along with the survey form link.

The study determined the minimum sample size criteria developed by Westland (2010) to satisfy the threshold for structural equation modelling (SEM). We used the formula \( n = \frac{50r^2 - 450r + 1100}{r} \), where \( n \) denotes the required sample size and \( r \) is the ratio of dimensions to latent variables. In the present study, we have 4 constructs and 19 items, \( r = 4.75 \). Hence, the minimum sample size calculated is 90.6. Sample size of 254 was adopted, which is greater than the minimum sample size required for SEM analysis.

**Model Reliability and Validity**

At first, Exploratory Factor Analysis (EFA) was applied to identify items with high factor loadings, more than 0.7. We removed all items with factor loading less than 0.7 and correlation higher than 0.9. We found in the reliability test that Kaiser-Meyer-Olkin value was 0.876 and the test of sphericity was very small, close to 0.000 (Bartlett, 1954). To check error of common method bias (CMB), we used the methodology suggested by Harman’s single factor test. In this method, all the items are adjusted around a signal factor using principal components unrotated procedure. The total variance resulting from this test was 33.18, which is lower than the accepted level of 50 percent. This confirms absence of CMB in the analysis (Yang et al., 2012). Further, to confirm reliability, Cronbach’s alpha coefficient, composite reliability (CR) values, average variance extracted (AVE) values, were estimated and found above accepted levels (Hair et al., 2010). In addition, to further confirm discriminant validity, the average shared variances (ASV) and maximum shared variance (MSV) were estimated and they met the recommended values (Hair et al., 2010). See Table 1 for all the values.

Table 2 explains correlations among all the factors, along with the square root value of each AVE represented diagonally. All the values are greater than the corresponding factor’s correlation with other constructs. After confirming reliability and validity measures, we performed the confirmatory factor analysis in AMOS 18 and measured model fitness of the model. All the model fit values are presented in Table 3 and were found fit based on the recommended values.

**RESULT ANALYSIS**

In the context of assessment of antecedents of user’s behavioural intention, the study found a positive significant impact of performance and effort expectancy (PE and EE) and social influences (SI), on user’s behavioural intention (BI) with m-commerce services (see Table 4). This accepts hypotheses H1 and H2. Finally, disturbance concern was not found significant on user’s behavioural intention. Hence, hypothesis H3 is rejected.
To test the moderating effect, we used the multi-group analysis proposed by Lee et al. (2000) to measure the moderating influence of variables between independent and dependent variables. In this regard, we used the modified Student’s t-test. Similarly, to test moderating effect in the present study, we followed the approach explained below. Gender was divided into male and female, education was divided into undergraduate (UG) and postgraduate (PG), for the study. All the remaining moderating variables were split into two groups using a median-split method (see Table 5).

In the first step, we included a few demographic characteristics of users: gender, age and education. Findings of the study indicate that males are more influenced by social norms than females, and more inclined to use mobile commerce services; on the other hand, the study did not find any moderating effect of gender on performance and effort expectancy, and disturbance concerns, of an individual. Explanation is that male influence is high in the relationship between social influences and behavioural intention as compared to females. This accepts hypothesis H4. Age, on the other hand, only moderates the relationship between performance and effort expectancy, and behavioural intention of a user. Statistical differences between two different age groups indicated that young consumers

**Table 1. Test for reliability and validity**

| Variables | Alpha coefficient | AVE | CR | MSV | ASV | Factor loading range |
|-----------|-------------------|-----|----|-----|-----|----------------------|
| SI        | .832***           | .65 | .88| .42 | .30 | .72-.89              |
| PE & EE   | .818***           | .64 | .90| .50 | .28 | .75-.87              |
| DC        | .764***           | .62 | .89| .14 | .07 | .80-.92              |
| BI        | .834***           | .60 | .84| .50 | .33 | .76-.87              |

Source: Authors’ Survey, *** p < 0.01

**Table 2. Correlation matrix**

|        | SI   | EOU  | DC   | BI   |
|--------|------|------|------|------|
| SI     | .80  |      |      |      |
| PE & EE| .590 | .80  |      |      |
| DC     | .376 | .123 | .78  |      |
| BI     | .650 | .711 | .262 | .77  |

Source: Authors’ Survey, bold diagonal values are square root of AVE.

**Table 3. Goodness of fit**

| Fit Indices | Measurement Model | Structural Model | Recommended Value |
|-------------|-------------------|------------------|-------------------|
| /df         | 1.711             | 1.687            | <5                |
| GFI         | .912              | .901             | >0.9              |
| AGFI        | .882              | .865             | >0.8              |
| CFI         | .911              | .923             | >0.9              |
| RMSEA       | .062              | .060             | <0.08             |

**Moderating Effect**

To test moderating effect, we used the multi-group analysis proposed by Lee et al. (2000) to measure the moderating influence of variables between independent and dependent variables. In this regard, we used the modified Student’s t-test. Similarly, to test moderating effect in the present study, we followed the approach explained below. Gender was divided into male and female, education was divided into undergraduate (UG) and postgraduate (PG), for the study. All the remaining moderating variables were split into two groups using a median-split method (see Table 5).

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(less than 25 years) perceive m-commerce more convenient and useful and will be more inclined to use it than adults (more than 25 years) (Mang et al., 2016). This partially supports hypothesis H5. In the context of demographics, education was found to have a moderating effect on the impact of social influence on behavioural intention of a user. The explanation is that users with low education are more influenced by social factors than users with high education, in adoption of m-commerce services, at 1 percent significance level. However, the study finds no moderating effect of education on the other two variables: performance and effort expectancy, and disturbance concerns, which partially accepts hypothesis H6.

Lastly, analysis was extended to test the moderating effect of types of m-commerce services such as banking, ticket booking and shopping, on the model. In the first step, the study showed that users with low use of m-commerce banking services present higher intensity in the relationship between performance and effort expectancy, and behavioural intention, of a user than users with high use of m-commerce banking services. Secondly, the data showed that users with high use of m-commerce ticket booking services display higher inclination in the relationship between performance and effort expectancy, and behavioural intention of a user, than users with low use of m-commerce ticket booking services. Lastly, we found a significant difference between users with low use of m-commerce shopping activities and users with high use of m-commerce shopping activities in the relationship between social influences and behavioural intention of a user. This partially accepts hypotheses H7, H8 and H9. Table 5 includes results of all the moderating effects. Figure 2 depicts the structural model of the study.

Table 4. Outcome of the hypothesis

| Number | Hypothesis | Path | T-Value | Sigf. |
|--------|------------|------|---------|-------|
| H1     | PE& EE-> BI | .589 | 7.613   | .000  | YES   |
| H2     | SI-> BI    | .321 | 3.214   | .000  | YES   |
| H3     | DC-> BI    | .076 | 1.268   | .172  | NO    |

Table 5. Moderating effect

| H4 Gender | H5 Age | H6 Education |
|-----------|--------|--------------|
| SI->BI Male | PE & EE->BI | UG | 0.667*** | 0.086 |
| Female | Female | Female | 0.456*** | 0.081 |
| PE & EE->BI Male | PE & EE->BI Male | UG | 0.602*** | 0.1 |
| Female | Female | Female | 0.633*** | 0.066 |
| DC->BI Male | DC->BI Male | UG | 0.39*** | 0.093 |
| Female | Female | Female | 0.007 | 0.072 |

| SI->BI Low usage | SI->BI High usage | PE and EE->BI Low usage | PE and EE->BI High usage | DC->BI Low usage | DC->BI High usage |
|------------------|-------------------|------------------------|------------------------|------------------|------------------|
| 0.519*** | 0.499*** | 0.678*** | 0.397*** | 0.206* | 0.006 |
| 0.082 | 0.069 | 0.086 | 0.054 | 0.091 | 0.077 |
| 0.027 | 0.014 | 0.14 | 0.08 | 0.337 | 0.200* |

Source: Authors’ Survey, *** p < 0.01, ** p<0.05, * p<0.10
DISCUSSION, CONCLUSIONS AND IMPLICATIONS

Discussion and Conclusions

The present research explains the impact of various factors such as PE and EE, SI and disturbance concerns, on behavioural intention of the user, related to various segments of m-commerce (Amoroso & Watanabe, 2012; Koenig-Lewis et al., 2010; Wu et al., 2017; Singh et al., 2017). The theoretical model concludes that the overall variance explained by all the independent variables to measure user’s behavioural intention is 0.675.

The study used several UTAUT variables (Singh et al., 2017), along with DC (Abubakar & Ahmad, 2014), to find their impact on behavioural intention. Study results supported the findings of previous researches on different technology services such as m-shopping, m-tourism, ticketing services and m-banking services (Xiang et al., 2015; Hew et al., 2016a; Makki et al., 2016a; Tan et al., 2017). We found PE and EE as the determinants with highest impact; second is social influences on user’s behavioural intention (BI) to use m-commerce services. This confirms that when users perceive m-commerce services as useful and easy to operate, they are content to make it a part of their daily activities (Abubakar & Ahmad, 2014). The results are found consistent with other studies done in different countries such as India, Malaysia, Spain, Hongkong, Camron etc. (Riquelme & Rios, 2010; Madan & Yadav, 2016; Oliveira et al., 2016; Tan & Ooi, 2018). Thus, SI is found to be the second most important determinant to predict behavioural outcomes of users. Research by Wang & Chou, 2014, also resonates the role of SI as a determinant to choose a technology service. Other empirical researches also validated the role of SI on m-payment services, as well as beliefs and values of consumers (Tak & Panwar, 2017; Karjaluo et al., 2018). Chong et al., (2010) confirmed that users seek opinions and perceptions of their social networks, family colleagues etc. before selecting to use a technology service. In the present study, we have not found disturbance concerns as a significant determinant of BI for m-commerce services. This could be due to increased awareness and the advances in security layers in web-based services. Nowadays, users have clear understanding and the capability to handle technical complexities and privacy issues of the system, and are not concerned with privacy issues of an online service (Pelaez et al., 2019; Gao et al., 2018).

Furthermore, the empirical framework included moderating impact of gender, age, education and usage of various m-commerce services (banking, ticket booking and shopping). The findings explained that gender and education only moderate the impact of SI on user’s BI towards m-commerce services.
services. The empirical findings resonate with the study done by Zhang et al (2017) in the UK; they identified males to be more social, emotional as compared to females, who are more independent and courageous. Hence, males are more inclined to use m-commerce services than females (Tan & Ooi, 2018). On the other hand, the study reported that education level of a user influences her/his perception of use of m-commerce services. These empirical results align with the research of Wei and Lu (2014) done in the US; they confirmed that highly educated users and their decisions are largely based on own judgment and logical thinking, and generally do not get influenced by social factors, whereas users with low education always seek opinions of others and family, before adopting a new technology service. Research conducted by Emarketer.com (2017) in the United Kingdom for mobile tourism products found that young users believe m-payment to be safer and more convenient, and they have positive inclination as compared to older age users. Our results support these findings and report young consumers to be more inclined towards different m-commerce services (Dahlberg et al., 2015; Yang et al., 2012; Williams et al., 2015).

In the framework of determining the moderating impact of types of mobile commerce services, the present study explained the impact on all the relationships among constructs in the hypothesised model. In line with previous researches on mobile banking, shopping and ticket booking services, the study shows significant influence of these variables on user’s behavioural outcomes (Pan et al., 2015; Zolkepli & Kamarulzaman, 2015; Wu et al., 2017; Singh et al., 2017; Liébana-Cabanillas et al., 2018). Results of the present study reveal that users with low use of m-commerce banking services are more fascinated with the usefulness and convenience of a technology, which may lead to high inclination towards the service (Grant & Edgar, 2012). Madan & Yadav (2016) have done a similar study on mobile banking services in India and found that PE and EE positively impact user’s intention and usage of technology. Secondly, the findings explain that, with respect to ticket booking services on m-commerce devices, users with high use of ticket booking services are more inclined to aspects such as usefulness and effectiveness of an IT product, which may influence their intention to use new technology. Several related studies pertaining to ticket booking on tourism products discuss the role of these variables on user’s intention in detail (Kim et al., 2016; Tan et al., 2017). Lastly, with regard to shopping, the research found that users with low use of m-commerce shopping services are more influenced by social norms than users with high use of mobile shopping services. There are similar studies available where mobile shopping behaviour of a user is discussed in the perspective of various countries such as India, US, UK, Spain (Yang, 2010; Liébana-Cabanillas et al., 2018). This research has added to the understanding of the determinants as reported by previous academic studies on m-commerce services in the Indian context. It also measures user’s BI in new categories such as use of banking, ticket booking and shopping services, on m-commerce devices.

Theoretical and Practical Implications

There are numerous studies that discuss the role and relevance of m-commerce services in different types of services such as tourism, digital library, e-commerce, peer-to-peer payments, retailing, travelling, e-shopping and other banking services (Shaw, 2014; Reuver et al., 2015; Apanasevic et al., 2016; Oliveira et al., 2016; Madan & Yadav, 2016). These studies discussed mobile commerce services in general. Very few studies elaborated on the use of m-commerce services in specific segments namely, banking, ticket booking and shopping-related services of users. From the research point of view, the findings confirm the significance of the chosen UTAUT variables and disturbance concerns, on user’s inclination to use m-commerce services. Moreover, this research contributes by extending the relationship with the moderating effect of usage (banking services, ticket booking services, shopping), other demographic variables such as age, gender and education, between independent and dependent variables (Thakur & Srivastava, 2014; Lin et al., 2007; Tan & Ooi, 2018; Liébana-Cabanillas et al., 2018). These features of mobile commerce services were covered in numerous previous studies but none of them were able to observe and capture the direct and moderating effect of these constructs in one framework (Singh et al., 2017).
Another theoretical contribution of the study is the moderating effect of demographics and selection of various categories of m-commerce services such as banking, ticket booking, and shopping. This research attempts to analyse the influence of these variables on user’s behavioural outcome. The results will help us to understand user’s perceptions and expectations from a specific m-commerce service used, which is still not discussed in detail in connection with young consumers in India (Chong et al., 2010; Tan et al., 2012; Sharma & Sharma, 2019). The moderating effect of demographics specific to gender, age and education, are still unknown in the Indian context (Purba, 2015). The moderating effect of demographic variables will help payment institutions to offer appropriate and desired services to a specific segment of consumers (Tajvidi et al., 2017; Singh et al., 2017). The present study suggests an empirical model, which may help future studies to identify the usage and popularity of various categories of m-commerce services and determine factors that may impact adoption of such services in a developing country like India.

From the practical point of view, this study highlights the relevance of antecedents of m-commerce services from the perspective of users. This is a unique study which includes the use of specific categories of m-commerce services such as ticket booking, banking and shopping. Detailed understanding of these services most used by consumers is significant to banks, retailers, telecom companies, software companies etc., to enhance convenience and popularity of such services among users. In addition, the moderating effect of demographics such as age, gender and education, will help payment companies and banks to design customized m-commerce services suitable to different segments of consumers and enhance their usage (Liébana-Cabanillas et al., 2014; Duarte et al., 2018). The findings empirically identify the performance and effort expectancy constructs essential to develop m-commerce services. App developing firms and marketing managers of various payment companies must promote usefulness and easiness of the wallet and digital services to consumers, to enhance their usage and adoption. Moreover, social influence is another key dimension, which must be deeply analysed in the Indian context. The present study emphasises the significance of social influence by friends, family, and networks, on user’s behavioural intentions (Oliveira et al., 2016). In conclusion, in India, tele-density is quite high and businesses can optimally utilise it for reaching out to consumers. SMEs in India have been dependent on domestic trade, but with facilitation of mobile technologies, they are exploring opportunities globally. As the m-commerce ecosystem develops, overseas trade will improve and online export market will expand.

**Limitations and Future Scope**

This study has certain limitations. In general, this study is done on a closed small group of Indian consumers. The result may not be applicable to measure behavioural traits in larger group of consumers, hence future study may approach large and diverse demographic groups belonging to diverse cultural, regional, economic backgrounds etc., to understand different dimensions of mobile commerce services. The present study discussed a few of the UTAUT variables, which may not be able to explain all the technical, psychological, behavioural etc. aspects of m-commerce adoption. Future researchers must include cultures, psychological and technical dimensions such as facilitating conditions, stress, habit, trust, security, quality, enjoyment and other essential elements of user’s behavioural intention. We also examined the moderating influence of a few demographic factors of the consumers such as age, gender and education, as well as the usage of a few service categories of m-commerce services. These results cannot be generalized to all types of m-commerce facilities and services. We therefore suggest reviewing the findings of the present study in detail, extending to all different categories of digital services or products such as educational products, hospitality products and streamlined services. Lastly, the study used Harman test for measuring the common method bias (CMB) problem which has drawn criticism and is not considered the most effective way to assess CMB (Fuller et al., 2016). Therefore, future studies may use other effective methods including latent market variables or inclusion of social desirability scales, in the questionnaire to test method related errors.
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ENDNOTE

Note: $x^2/df$ is the ratio between Chi-square and degrees of freedom; GFI: Goodness of Fit Index; AGFI: Adjusted Goodness of Fit Index; CFI: Comparative Fit Index; NFI: Normed Fit Index; RMSEA: Root Mean Square Error of Approximation

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