Mobile Commerce Adoption in Developing Countries: An Indian Study

Dr Jyoti Batra Arora

Project Associate, Institute of Chartered Accountants of India, Noida, India. jybatra@gmail.com

Abstract - Mobile Commerce (M-Commerce) is emerging technology that has improved the efficiency and productivity in various sectors. M-commerce can be done using handheld devices like mobile phone and plam-top etc. However there are certain issues related to usage of mobile devices for sale and purchase in developing countries. There is limited study available for adoption of m-commerce by developing countries. This study aims to fill the gap and assess the adoption of m-commerce in India- a booming economy. This research paper is with primary data that would assess the level of adoption, experience of benefiter's, and problem encountered in adoption of m-commerce. A few factors affecting the adoption of m-commerce and the geographical and socio-economic condition of India in relation to m-Commerce adoption are highlighted in this paper. The findings of the research conducted so far indicate a positive growth of m-Commerce adoption in India.

I.   INTRODUCTION

Mobile phone has changed the lifestyles of consumers worldwide being it any age group. Mobile commerce or m-Commerce is based on various ICT technologies and has potentially improved the trading efficiency of consumers. Laudon and Traver (2019) defined m-Commerce as the applications and services that are dramatically available via internet enabled mobile device. M-commerce is the progeny of e-Commerce therefore; sometimes it is also called as Mobile E-commerce. M-commerce is defined as exchange of goods using internet on mobile phones and PDAs (Lee, 2003).

Most of the technologies were developed in western countries. Developed countries are countries having different background than developing countries that impacts the adopting of m-Commerce over there. The success and adoption of m-Commerce in those countries depends on various factors like educational standard of citizen, socio-economic condition of country and how adopters fit themselves in these technologies. It is not a surprise that technology adoption has not always been successful in developing countries.

This paper presented the adoption of m-Commerce as an emerging technology by developing countries using India Inc as a case. The objective of this paper is to describe the reason for adoption, the experience of benefiters, issues and problem encountered while adoption and trust of users etc. For this purpose, a questionnaire is distributed among various organizations-public and private, Universities and businessman. This paper comprises of two sections- the first section describes the m-Commerce and its benefits,

along with the geographical and educational status and detail of other factors that may affect the adoption of m-Commerce. The second section describes model for the adoption of m-Commerce, stated hypothesis, the result and analysis of the data collection from random sample. A brief overview of m-Commerce in India is then presented and finally conclusion and future studies are outlined.

II.   LITERATURE REVIEW

M-commerce is still in its infant stage in India due to its complex nature. India has 1.17 billion of mobile users. It was predicted that by 2022, 36% of mobile phone users in the country would use a smartphone, up from 26% in 2018 (statistica.com). As a result, there has been expected a significant growth of m-Commerce in India than other developing countries. Adoption of M-commerce in India is rather complex. In the present scenario of India Inc. it has both benefits and limitations. Wherein user friendliness, factor of personalization and mobility are the benefits and language barrier, geographical condition and network availability are few of major limitations of m-Commerce (Lu etal. 2015). In India, people use m-Commerce mainly for booking tickets, e- auctions, entertainment and so forth. M-commerce has changed the perception of people in purchasing and mode of business. People used m-Commerce to attain knowledge and managing their bank accounts also (Khan, Taiab and Faisal, 2015). M-commerce also raises the issue of security and privacy of user which may deter the adoption of m-Commerce. Risk has a negative effect on attitude towards use of m-Commerce especially in India Inc, where people have high resistance to adopt new technology.

Venkatesh etal. (2003) poised that saving time, varying locations, mobility and convenience are the main features of m-Commerce. The mobile devices in near future may hold the potential to transform pattern of information communication and consumption.
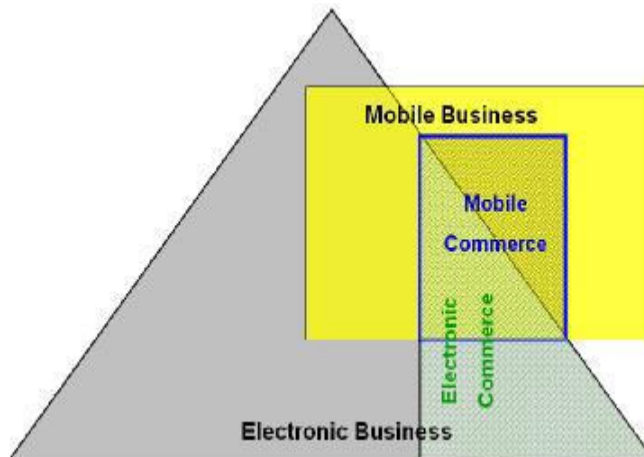

Fig1 : Perspective of M-Commerce

As shown in fig. 1 the holistic approach of m-Commerce represents how m-Commerce is closely related to e-Commerce. The services used in both are handled electronically using computer mediated networks which can be accessible through telecommunication network. Mobile devices are the ideal channel for offering location base and personalized services. M-commerce is all data-driven business transactions and exchanges of value by users of mobile devices via wireless telecommunication networks (Feng et al., 2006).

M-commerce is a new industry in India, a lot of work is required to be done in this sector. Internet connectivity and mobile networking is still not accessible to entire population. However, there are certain factors like youth's perception, growth of financial area and increased number of smart phone buyers that inspire the growth of this industry (Gupta, 2014). Using m-Commerce, users can complete business transaction online and also handle the transaction round the clock. Organizations are also managing their businesses through mobile apps which are integral parts of m-Commerce.

Statement of Problem

The population of India is 1352.6 billion and the numbers of mobile users are 813.3 million. In the forecast by Gartner the m-commerce growth will reach to 1.37 billion by the year 2020. The numbers of urban mobile users are 293 million and numbers of rural mobile users are 200 million. And the population of India that lived in rural area is 70%of total population. To make m-Commerce as a success it is required that rural population should actively participate in the growth of m-Commerce. RBI, TRAI, banks and many service providers are trying to take the m-Commerce to rural area. Idea cellular company has tied up with AXIS bank for mobile banking solutions. Similarly SBI and ICICI

bank have partnered with EKO a mobile banking technology provider for mobile banking solutions. From the total mobile users of India 36% have bank account and 24.5 million have credit cards. In urban area of country most of the people have bank account but still use cash for 90-95% for their purchase. The purpose of this research paper is to identify adaptability of m-Commerce in India.

Like other developing countries India devotes only bits of its GDP to ICT implementation. India Inc. has low E-Readiness Index. India has scored 44th position in world digital competitiveness ranking (The Economics times, 26th September 2019).Since last ten years country has shown a good growth and economic and political development. But GDP growth has not shown any sharp moment. Due to these recent changes Indian citizen has shown a good change in their attitude towards using m-Commerce which has played a crucial role in industrial and technological development.

III. PROCEDURE AND RESEARCH HYPOTHESIS

There are various factors which influence the adoption of m-commerce such as geographical, socio economic, educational background, age, gender, perceived ease of use, perceived usefulness, trust, self-efficacy and innovativeness etc. The relevance and description of these factors along with generated hypothesis are given below:

Perceived ease of Use

A huge study is available related to effects of perceived ease of use on adoption of mobile internet (Kurna etal. 2006) mobile banking (Luran and Lin 2005) 3G mobile services (Liao etal 2007) and m-Commerce (Yang 2005; Wu and Wang, 2005; Cho et al., 2007; Wei et al., 2009; Dai and Palvia, 2009; Sadi and Noordan, 2011; Chong, 2013, Al Mashagba et al., 2013). All other studies poised that there is positive affect on behavioral intention of users except Wu and Wang (2005) and Cho et al. (2007). Hence, it results in hypothesis H1.

H1: Perceived ease of use has positive effect on adoption of m-commerce.

Perceived usefulness

Jeyarah etal. (2006) defined Perceived usefulness as the value obtained from a technology and most studied and effective variable on adoption of Information technology. There are many studies that has shown the effect of perceived usefulness on internet (Teo 2001, Lu etal. 2003, Hung etal. 2003), mobile entertainment (Wong and Hiew, 2005) and m-Commerce (Cho etal 2007,Chong 2013, Al mashagba 2013). All other research has shown positive impact of perceive usefulness on behavioral intention of user except Cho etal. Therefore, it generates hypothesis

H2: Perceived usefulness has positive effect on adoption of m-Commerce.

Innovativeness

Innovation refers to adoption of new technology and products. It is expressed as personality trait of consumer w.r.t. to new technology. Innovation is considered as major determinant of m-Commerce adoption (Dai and Palvia, 2009 and Sadi & Noordan, 2011). Hence, it raises the hypothesis

H3: Innovativeness has positive impact on m-Commerce adoption.

Trust

Consumer trust is very important to implement or adopt any new technology. Behavior intention and attitude of consumer is necessary to make optimal use of m- auction (Wang and Barness (2007)). Sadi and Noordan (2011) suggested the trust as an important determinant in finding the usage of m-Commerce. This factor is important to analyze the consumer behavior (Lodorfos etal. 2016). Therefore, the generated Hypothesis is

H4: Consumer trust has positive impact on adoption on m-commerce.

Self efficacy

Lee (2005) defined it as one's believe to own ability to reach goal or to fulfill a mission. It is also related to consumer behviour and attitude. Garlin and McGuiggan (2005) studied its impact on consumer behvaiour. Its effect on mobile banking is discussed by Luaran and Lin (2005). Hence it generates hypothesis:

H5: Self-efficacy has positive impact on adoption of m-Commerce.

Demographic factor

As discussed earlier demographic factors such as education, income, age and gender have very significant effect on adoption of m-Commerce. The literature on these demographic factor is discussed by Chong (2013), Bigne etal.(2007), Mort and Drennan (2005), Pijpers etal (2001) etc. Most of the studies indicate that gender has positive impact on adoption of m-Commerce. These variables are considered as control variables, as these affect the behavioural intention of consumer while using m-Commerce. Age, gender and education are significantly different for self efficacy and innovativeness. However this study has realized that in developing countries like India where more than 45% of population lived in rural area, not only gender but availability of facility in terms of city where consumer lives and education has also a positive impact on adoption of m-Commerce. Hence, it generates the hypothesis

H6A: Consumer's age and gender are significantly different for both self-efficacy and innovativeness and consumer intention to adopt m-Commerce.

H6B: Consumer's education and city in which consumer live has significant impact on adoption of m-Commerce.

IV.   THE RESEARCH MODEL

An empirical research method is used for this study. A Questionnaire was distributed to various organizations. Their responses were analyzed on Likert scale 5 point response, viz., Strongly Agree, Agree neutral, Disagree and Strongly Disagreee; wherein "1" expressed as strongly disagree,"2" expressed as disagree,,"3" expressed as neutral, "4" expressed as strongly agree, "5" expressed as strongly agree. On the basis of their test result, the researcher has tried to produce the status of m-Commerce adoption in India Inc. This questionnaire was vetted by 300 various persons inclusive of academician, managers of banks and Institutions and home makers also who has smart phone and bank account. The questionnaire was distributed irrespective of gender, age and income.
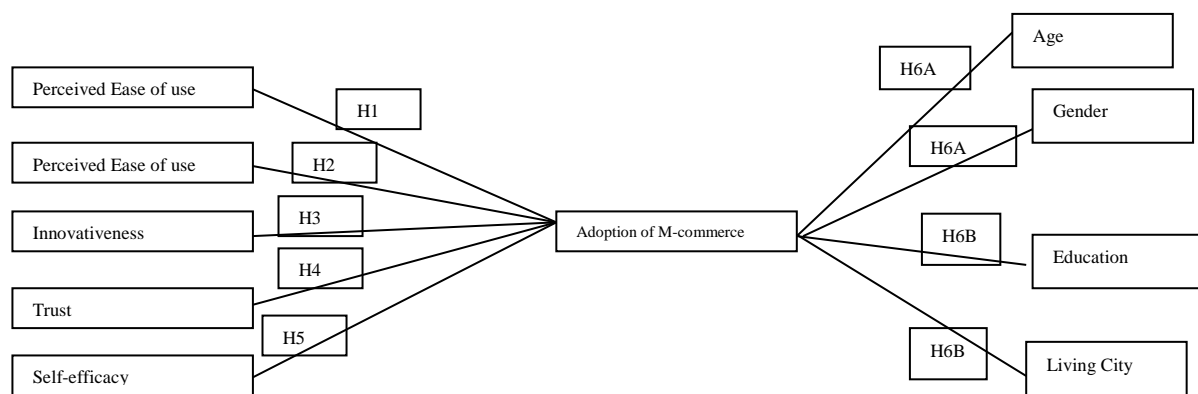

Fig 2: Research Model

Reliability

Reliability is based on idea that each item should produce result consistent with the overall questionnaire. It refers to the ability of the questionnaire to create the same result under same conditions. The most common method to measure the reliability is Cronbach's alpha. To test the reliability and internal consistency the Cronbach's alpha is used on the sample size of 300. The ideal value of this test should be 0.86 while the result is 0.6 which is on higher side. Explorartory factor analysis is determined by using exploratory factor analysis on eight dimensions –perceived

usefulness, attitude towards use, Behavioural Intention, Innovative Index and adoption in terms of Perceived Ease of Use and Compatibility/adoption of m- Commerce   in India Inc.

Age Group	Number	Percentage
15-25	70	23.3%
25-36	175	58.3%
36-45	30	10%
45-55	22	7.3%
Above 50	3	1%

Table 1

Gender	Number	Percentage
Male	170	56.6%
Female	130	43.3%

Table 2

Educational Level			Occupation			
Level	No.	% age	Level	No.	%age
Intermediate	10	3.3%	Housewife	30	10%
Bachelor	20	6.66%	Employed/ Service	170	56.6%
Master	220	73.3%	University Student	40	13.3%
PhD & Above	50	16.67%	Student	20	6.6%
			Professor	20	6.6%
			Business Person	20	6.6%

Table 3

City	Number	Percentage
Metro city	189	63%
Non-Metro city	111	37%

Table 4

Table2 represents the ratio of male and female who participated in this survey. Table4 shows the ratio of metro city and non metro city participants. The questionnaire was distributed online through google form to support green computing and save environment. The primary data is used for result analysis and result calculation. Few banks are promoting m-Commerce and their customers are adopting the same. But due to safety purpose their data was not available therefore this primary data is used for result analysis.

V.   DATA ANALYSIS AND RESULTS

Fornell & Larcker (1981), given the reliability, Cronbach's Alpha and Composite Reliability criterion to test the reliability of items to be use in research. The reliability and average variance extracted from each construct is higher than 0.7 and 0.5 respectively which is on higher side and indicates the achievement regarding convergent validity. Table 5 shows this result.

Construct	Items	Range of Factor Loadings	Cronbach's Alpha	Composite Reliability	AVE
Perceived Ease of use	4 items	0.784~0.898	0.883	0.907	0.713
Perceived usefulness	4 items	0.852~0.920	0.921	0.944	0.808
Innovativeness	4 items	0.848~0.931	0.860	0.915	0.782
Trust	3 items	0.853~0.908	0.851	0.910	0.771
Self efficacy	4 items	0.701~0.831	0.783	0.860	0.607

Table 5: Reliability analysis and Convergent Validity

For goodness of fit , Moores's (2012) formula is used to check the results. The formula is

$$GOF = \sqrt{A\overline{VE} * R^{2}}$$ and the resulting value after checking is 0.795 which is higher than the general standard value i.e. 0.36 and shows that the GOF of aforementioned framework of the research is good. t-test is used to examine the adoption of m-Commerce depending on gender and city of living which is determined in hypothesis H6A, whereas ANOVA test is used to examine differences of user's m-Commerce by age and education level which is determined in hypothesis H6B. The t-test examined whether there are significant differences between female and male with relation to m-commerce adoption. The result of t- test is 26,894, the p value comes to be 0.03; $p<0.05$, which indicates that females are more interested and tend to shop/ purchase on m-commerce. The p value is 0.004 which is less than expected value ($p<0.005$) stated that there is significant differences between education level. The result of annova test shows that higher the education level higher is adaptability of m-commerce. The average of intermediate level is 2.88; average of graduate level is 3.65 and average of higher education (inclusive masters and PhD is 4.65. Similarly for the t values for perceived ease of use (t-9.6952), perceived usefulness (t= 4.44), self-efficacy (t = 4.6) have significant effect on adoption of m-Commerce. Hence, it supports the hypothesis H1, H2, H4 and H5.

Analysis is done on all these parameters to analyze the responses of users and to generate the qualitative result. This shows that users are more interested to adopt m-commerce 75% of users are more satisfy with the m-commerce usage and making purchase using m-commerce. Results also show that there is huge scope to grow and develop m-commerce in India. Users prefer m-commerce than conventional purchasing methods and consider it as standard and convenient transaction mode. The users are also happy with anytime anywhere services of m-commerce.

The cost of mobile phone does not effect the users to make use of m-commerce.as mentioned earlier the number of smartphone user in India is high as compared to other developing nations therefore this factor does not have any impact on customers perceived usefulness on m-commerce.

The answers of questions under "Innovativeness" shows that m-commerce in India inc is still in its infancy stage as 75% of users agreed that they use m-commerce for buying

tickets for movie and travel. 63% users agreed that they use m-commerce for buying apparels and groceries. 45% users says that they don't use mobile app for their internet banking. They prefer the security and privacy over the mobile banking. However 77 % user agreed they use m-commerce for making payments but for small transaction only like groceries, daily use items such as milk butter etc.Risk of failure and fraud has negative effect on using m-commerce. However, users are also worried about privacy and security,as these issues can be occur in m-commerce and may result in less customer satisfaction is transaction security, personal data information which is logical but may lead to loss of trust and intention to use m-commerce.

VI.   CONCLUSION

M-commerce has to do a lot of work, it is the new industry for India; though the mobile users are increasing day by day in the country. The internet connectivity and mobile connective networking is not accessible by every one, hence m-commerce industry faces astounding amount of growth. Busy lifestyle, traffic congestion and lack of time for offline shopping added the value in growth of m-commerce. The quantitative data analysis of this research paper shows that mobile users are more interested and happy with purchase of grocessories, apparels and other daily routines things. These factors are remain intriguing and inconclusive, however certain factors are also needed to be studied like acceptance rate, organizational benefits, and lucrative offers for making payment online. The result analysis shows that number of mobile users are increasing in country and users prefer mobile commerce than traditional commerce. The results also show that females are more interested to purchase online. The geographical location also play an important role in promotion of m-commerce. This research paper discusses the adoption of m-commerce from users' perceptive whereas the role of policy makers cannot be denied in adoption of m-commerce. Certain government policies and regulations also effects the adoption of m-commerce in every area. Hence the discussion and impact of policies can also be the part of research in adoption of m-commerce.

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