

A STUDY OF ADOPTION BEHAVIOUR OF MOBILE BANKING SERVICES BY INDIAN CONSUMERS

NITIN NAYAK¹, VIKAS NATH² & NANCY GOEL³

¹Director and Professor, Bharati Vidhyapeeth Institute of Management and Research, New Delhi, India

²Professor and Dean (Research), Bharati Vidhyapeeth Institute of Management and Research, New Delhi, India

³Research Scholar, Bharati Vidhyapeeth Institute of Management and Research, New Delhi, India

ABSTRACT

Recent innovations in the telecommunication have proven to be a boon for the banking sector and its customers: one of these is Mobile Banking, where customers interact with the bank via mobile phones and banks provide them the services like short message services, fund transfers, account details, issue of cheque book etc. Presently almost all the banks in the world have started providing their customers “Mobile Banking” services. The main issue of this study is to understand the factors which contribute to user’s intention to use the mobile banking services. The purpose of this review paper is to explore the factors that influence the adoption behaviour of mobile banking services by Indian consumers. This paper also discusses the various steps that mobile banking providers should take to increase their mobile banking services user’s database.

KEYWORDS: Mobile Commerce, Mobile Banking, TAM, TRA, IDT, UTAUT, Adoption Behaviour

INTRODUCTION

According to TRAI, mobile banking involves the use of mobile phones for banking transactions like fund transfer, balance check, etc. As per the extant guidelines of RBI, banks that are licensed, supervised and have a physical presence in India, are permitted to offer mobile banking services. Mobile Banking policies in India aim to enable funds transfer from an account in any bank to any other account in the same or any other bank (interoperability) on a real time basis irrespective of the mobile network the customer has subscribed to (TRAI, 2013). The Mobile phone plays a very important role in the development of mobile commerce and mobile banking.

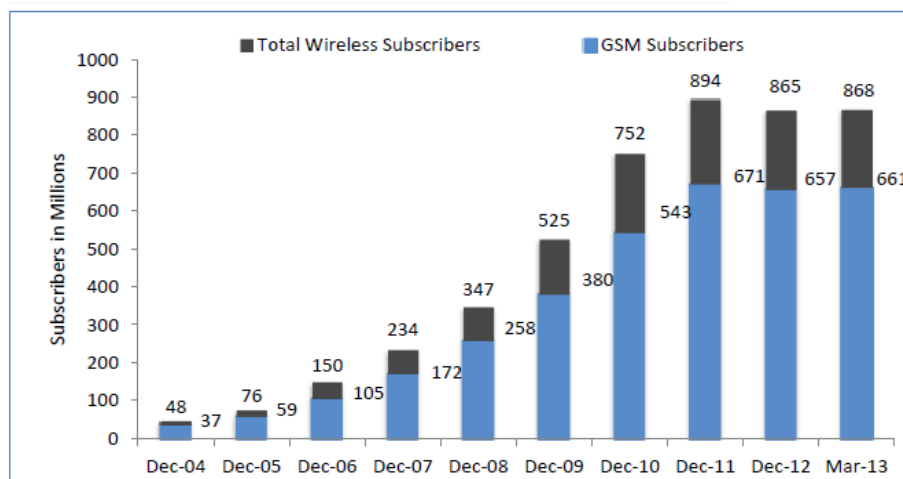
History of Mobile Phones in India

A report of the Cellular Operators Authority of India (CAOI), regarding the entry of cell phones into India, depicts that it was in the year 1992 that telecommunication Sector in India liberalized to bridge the gap through Government spending and to provide additional resources for the nation’s telecom target and the private sector was allowed to participate. In the year 1994 India was licensed to provide cellular mobile services granted by the government of India for the Metropolitan cities of Delhi, Mumbai, Kolkata and Chennai. Kolkata became the first metro to have a cellular network in 1995.

TRAI was set up in the year 1997 for the regulation of telecommunication sector in India. In March 1999 National Telecom Policy (NTP) was announced. In 2003 CDMA network was launched. In 2004 Broadband policy was announced. Mobile phone subscribers had reached 100 Million by 2006. In 2008, RBI issued operative guidelines for banks for mobile

banking transactions in India. By the year 2009, wireless subscriber base crossed 400 million. At present wireless mobile phone subscribers are 867 Million i.e. it has almost doubled in the last four years.

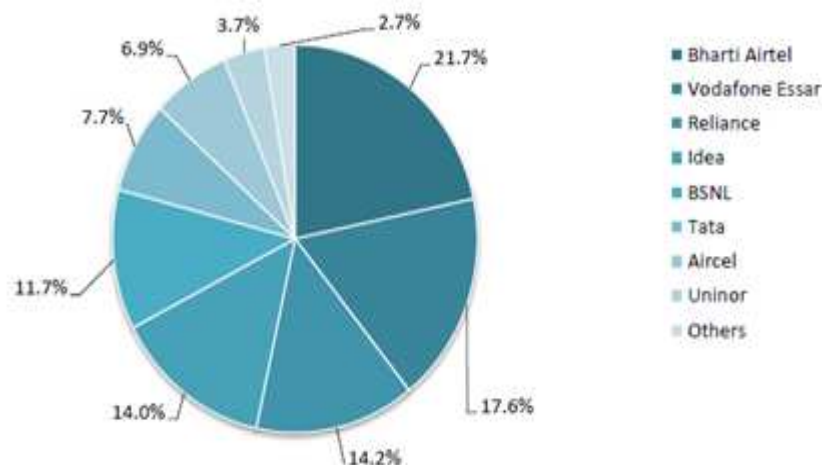
With the advancement in the operating systems of the mobile phones and mobile technology like 2G, 3G, 4G has brought a significant change in the way of working of mobile banking services providers. Since the introduction of 2G and the subsequently 3G, the demand for mobile phone has increased many folds. This can be interpreted by a rapid increase in the number of mobile phone subscribers (Figure 1).



Source: TRAI & COAI Annual Report, 2013

Figure 1: All India Total Cellular and GSM Cellular Subscriber Base

There are many wireless operators in India but Bharati Airtel has got the maximum share of 21.7% after the Vodafone Essar (17.6%) see Figure 2.

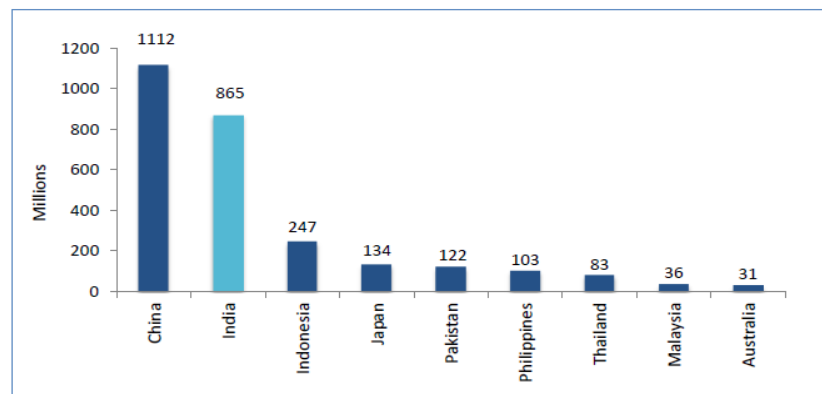


Source: The Indian Telecom Services Performance Indicators, TRAI March, 2013

Figure 2: Market Share of Wireless Operators

Top Ten Countries in Mobile Phone Subscribers Base

Mobile phone technology has become very common in all the countries of the world. According to Merrill Lynch Global research report 2011, China has the maximum number of mobile phone subscribers i.e. 1112 million and India stands on the Second position with 865 mobile phone subscribers. (See Figure 3)



Source: Merrill Lynch Global Research Dec- 2013

Figure 3: International Trend of Subscriber Base

Evolution of Mobile Commerce

Mobile Commerce in India is increasing at a very fast pace. According to TRAI (2013), subscribers who access the internet through wireless phones are 143.2 Million. Mobile commerce has emerged after the introduction of electronic commerce. A simple definition of E-Commerce describes it as: “*the buying and selling of products and services over the Web*” (Kalakota and Robinson, 2001). E-Commerce has gained importance in the last few years. E-Commerce applications developed so far, assume basically fixed users with wired infrastructure such as PC Connected with internet using a LAN (Local Area Network). Many new E-Commerce applications are possible using wireless and mobile networks. These applications are termed as ‘Wireless E-commerce’ or ‘Mobile Commerce’. With the increase in the number of wireless internet subscribers and advancement in the operating systems of mobile phones, mobile commerce has reached to every nook and corner of the world.

M-Commerce is an area which is rapidly changing the way people conduct their financial transactions. Tiwari, Buse and Herstatt (2006) discussed the features of mobile Commerce. According to the author M-commerce is characterized by many unique features as compared to the conventional form of commercial transactions like: Ubiquity, Immediacy, Localization, Instant Connectivity, Proactive Functionality and Simple Authentication Procedure.

- **Ubiquity:** It means users can avail the services and carry out transactions independent of the geographical location (‘anywhere’ feature).
- **Immediacy:** This feature is attractive in the way users can buy the goods anytime, i.e. without a wait (‘anytime’ feature).
- **Localization:** Positioning technologies i.e. GPS (Global Positioning Services) allows companies to offer goods and services to the user as per his/her current location.
- **Instant Connectivity:** With the introduction of the GPRS (General Packet Radio Service) mobile users are constantly online. This feature brings convenience to the users.
- **Pro-Active Functionality:** M-commerce brings opportunities for the companies like push marketing, where users can opt for ‘Opt-in advertising’ so that they are informed about new products and services in the form of SMS.

- **Simple Authentication Procedure:** With the help of Subscriber Identity Module (SIM) and Personal Identification Number (PIN) the authentication process has become very simple.

Mobile Commerce Applications

Mobile services of similar nature can be bundled together as mobile applications (see Figure 4). This study has been specifically focused on only one of the Mobile commerce application i.e. Mobile Banking.

M-commerce applications	
Application	Examples of services offered
Mobile banking	<ul style="list-style-type: none"> ● Mobile accounting ● Mobile brokerage ● Mobile financial information
Mobile entertainment	<ul style="list-style-type: none"> ● Mobile gaming ● Download of music and ring tones ● Download of videos and digital images ● Location-based entertainment services
Mobile information services	<ul style="list-style-type: none"> ● Current affairs (financial, sport and other news) ● Travel information ● Tracking services (persons and objects) ● Mobile search engines and directories- Mobile office
Mobile marketing	<ul style="list-style-type: none"> ● Mobile couponing ● Direct (context-sensitive) marketing ● Organization of mobile events ● Mobile newsletters
Mobile shopping	<ul style="list-style-type: none"> ● Mobile purchasing of goods and services
Mobile ticketing	<ul style="list-style-type: none"> ● Public transport ● Sports and cultural events ● Air and rail traffic ● Mobile parking
Telematics services	<ul style="list-style-type: none"> ● Remote diagnosis and maintenance of vehicles ● Navigation services ● Vehicle tracking and theft protection ● Emergency services

Source: Tiwari, Buse and Herstatt, 2006

Figure 4: M-Commerce Applications and Services

Mobile Banking

Mobile Banking services were first offered by Kenya and Philippines in the world. M-PESA – Kenya: M-PESA is the first mobile banking solution in the year 2007 by the telecom operators Safaricom & Vodafone. It has captured the majority of the market in Kenya and is very popular among the customers. SMART Money and G-Cash Philippines: Philippines launched SMART money, which is an electronic wallet and users do most of its banking transactions through mobile only.

There is a great scope of mobile banking in India as the number of mobile users is increasing. This is because of an increase in the number of wireless internet user subscriber base in India i.e. 143.2 Million (TRAI, 2013). In the year 2008, 3G was launched by MTNL (Mahanagar Telephone Nigam Ltd.) and IMPS (Immediate Payment Service) was also launched in 2010. After these initiatives and developments by RBI, mobile banking services have increased many folds and RBI issued the guidelines for banks to provide mobile banking services in India in the year 2008. These are:

- Only such banks which are licensed and supervised in India and have a physical presence in India will be permitted to offer mobile payment services to residents of India.

- The services should be restricted to only to bank accounts/ credit card accounts in India which are KYC/AML compliant.
- Only Indian Rupee based services should be provided.
- Banks may use the services of business correspondents for extending this facility, to their customers. The guidelines with regard to use of business correspondent would be as per the RBI circulars on business correspondents issued from time to time.
- The 'Risks and Controls in Computers and Telecommunications' guidelines will equally apply to mobile payments.
- The "Know Your Customer (KYC)" and "Anti Money Laundering (AML)" as prescribed by RBI from time to time would be applicable to customers opting for mobile based banking service.

Transaction Limits in Mobile Banking

- Only Indian rupee transactions and these transactions are allowed within India only.
- Per day transaction cap of Rs.50000 has been removed by RBI, and every bank can change this cap depending upon their risk.
- Transaction without end-to-end encryption is Rs.5000/- (SMS Based).

Security and Authentication

The highlights of security and authentication guidelines provided by the RBI on Mobile Banking:

- The M PIN or higher standard of mechanism should be used to authenticate the mobile banking customer.
- End-to-end secure encryption mechanism should be followed in transactions.
- The bank should conduct regular information security audits on the mobile banking systems to ensure complete security.

Despite many initiatives taken in the field of mobile banking there are only 12% (17 million) users out of 143.2 million mobile phone internet subscribers who are using banking services on their mobile phones (Alpesh Patel, 2013). So, the main issue of research is to understand the factors which contribute to user's intention to use the mobile banking services. The purpose of this review paper is to explore the factors that influence the adoption behaviour of mobile banking services by Indian consumers.

RESEARCH METHODOLOGY

This paper reviews the literature by identifying different articles, reports and research papers related to mobile banking. Different models are being used by many researchers like Technology Acceptance Model (TAM), Theory of Planned Behaviour (TPB) and Innovation Diffusion Theory (IDT) and these models are very helpful in determining the adoption of mobile banking services.

LITERATURE REVIEW

Mobile Banking, also known as M-Banking, can perform various functions like mini statement, checking of account history, SMS alerts, access to card statement, balance check, mobile recharge etc. via mobile phones (Vinayagamoorthy and Sankar, 2012). Banks are constantly updating their technology and want to increase their customer base by reaching to each and every customer. There are many advantages of using mobile banking, such as people in the rural or remote areas can also get an easy access to mobile banking whenever required. Vinayagamoorthy and Sankar, (2012) have discussed about the mobile banking and according to them it is a term that is used for performing various banking transactions like fund transfer, balance check, payments etc. via mobile phones.

First mobile banking transaction services in India were offered by ICICI bank in January 2008 (Mr. V. Vaidyanathan, 2008) but SMS alerts started in 2005-06 (Alpesh Patel, 2013). Wireless phone subscribers in India crossed 867.8 Million in 2013, as per TRAI (Telecom Regulatory Authority of India Act, 1997) as compared to 261.07 in March 2008. So there is approximately 4 times increase in the number of subscribers. However, according to this report, subscribers who access the internet through wireless phones are 143.2 Million. Almost 16.5% of wireless mobile phone subscribers are using the Internet over their mobile phones. According to a Mobile banking report by Deloitte (Alpesh Patel, 2013), 17 Million Indians are using mobile phones for banking transactions. So, approximately 2% of wireless phone subscribers are using banking services on their mobile phones. Mobile banking is still in its nascent stage in India. Therefore, identifying and understanding the factors influencing the behaviour of mobile phone subscribers is one of the fundamental requisite for development of mobile banking services in India.

Research in the field of mobile banking is at the introductory stage in India. It started in the year 2005-2006, with the introduction of short message services (SMS) of mobile alerts for transactions. Then in the year 2008, Reserve Bank of India (RBI) issued the guidelines for mobile banking transactions. In the same year MTNL (Mahanagar Telephone Nigam Ltd.) launched 3G in India. In 2010-2011 India launched its first IMPS (Immediate Payment Service (IMPS) which is an instant interbank (similar to NEFT) transaction that can be initiated only through mobile phones or online or through SMS. In the year 2011-12, Vodafone and HDFC bank launched m-paisa and Airtel launched Airtel Money in 5 cities in India. In 2012-13 Airtel-Axis Bank launched a mobile banking service for financial inclusion and money transfer. According to operative guidelines for banks by RBI, only those banks which are licensed and supervised in India and have a physical presence in India will be permitted to offer mobile banking services (Chugh, 2014). According to RBI report, there are 82 banks that are permitted by RBI to provide mobile banking services throughout the India (Reserve bank of India, 2014) as compared to 21 Banks in the year 2010.

During the last four years, the numbers of banks providing mobile banking services in India have increased four times. But numbers of mobile banking users have not increased at the same pace. There are many challenges that Indian banks are facing for increasing the mobile banking user database like Handset operability, Security, Scalability and Reliability, Application Distribution etc. Acceptance and adoption of this innovative technology is very complex and this 'complexity' attribute is studied by various researchers and they have suggested that banks should make these services easy to use by the Indian population because Indian population is not very well versed with this upcoming technology (Chaipoopirutana, Combs, Chatchawanwan and Vij (2009); Lin (2010); Sahin (2006).

To understand the adoption behaviour of users, many researchers have done research on the factors that helps in determining the acceptance and the attitude of users towards mobile banking. TAM (Technology Acceptance Model), TPB (Theory Planned Behaviour), IDT (Innovation Diffusion Model) (see Figure 5,6,7) have been discussed by Bhatti (2007) and Sadi and Noordin (2011) and they claimed that all the 13 factors i.e. Perceived Usefulness, Perceived ease of use, Personal Innovativeness, Perceived Trust, Perceived Cost, Subjective Norm, Social Influence, Self-Control, Perceived Behavioural Control, Facilitating condition, Self-Efficacy, Attitude towards use, and Intention to use M-commerce are statistically significant and by using exploratory factor analysis they concluded that the mere introduction of M-commerce is not sufficient but focus should be laid on the improvement of attributes that effect the M-Commerce adoption. Out of all the factors, perceived usefulness is found to be the critical factor thus, the service provider should take care that customers should perceive their services as valuable and useful to keep up with their fast paced lifestyle. This research also found that trust is also an important factor and should be taken into consideration by the Service providers; if consumers do not feel secure they will be reluctant to use the services. (Kim, Shin, and Lee 2007). It is also found that people have less trust in the mobile banking services and personal disposition to trust played a positive role in developing initial usage in mobile banking. To some extent the success of acceptance of M-commerce transactions depends on the customer as well as vendor's trust (Singh, Srivastava, & Srivastav, 2010). Kim, Shin, and Lee (2007) and AL-Majali and Mat (2011) also discussed that if customers believe that a mobile banking firm is able to develop effective service delivery strategies and provide adequate protection from fraud and violation of privacy, then adoption (or continue-to-use) intentions of the mobile phone users will increase.

Facilitating Condition is also an important attribute of consumer behavioural control towards intention to use; therefore it is necessary to improve the facilitating conditions of mobile application services like connection speed, secure systems and easy transaction method (sadi & Noordin, 2011).

Bhatti (2007), used all the three models TAM, TPB and IDT and found out that the perceived ease of use, perceived usefulness, subjective norm, personal innovativeness and perceived behavioural control are strong determinants of the intention to adopt M-commerce. The study has revealed that subjective norms and perceived behavioural control impact perceived ease of use and intention to adopt mobile commerce. Perceived control of users can be increased by offering them free use of service for a short period of time. Rapid adoption of technology, because of its social influence, is studied in terms of subjective norms and it is found to be a significant factor as the behavioural intention is very much affected by peer group influence.

Chaipoopirutana, Combs, Chatchawanwan, and Vij (2009) and Lin (2010), claimed that the adoption of mobile banking is 'complex' as it has the negative relation with intention to adopt mobile banking. In this paper they have discussed the Roger's (1995) innovation diffusion model's attributes: complexity, compatibility, relative advantage and trialability and found that Relative advantage, compatibility, ease of use (opposite of complexity) has a significant effect on attitude to adopt mobile banking services. They have also suggested that complexity must be reduced in order to increase the number of adopters in internet banking and compatibility has a positive relation with the adoption of internet banking. It implies that banks should start advertising their internet banking services to the consumers so that they can relate it to their values, beliefs and experiences of the adopters. Customers have a favourable attitude towards adopting mobile banking services, if they have positive belief about the relative advantage of mobile banking. Relative advantage refers to the degree to which a technology provides more benefits than its precursor (Rogers, 2003).

S.Samudra and Phadtare (2012) used the UTUAT model (see Figure 8) to investigate the adoption of mobile banking services and findings suggests that mobile banking services should be promoted to middle level managers whose salaries are in the range of 1-6 lacs and the age group is 25-30 as this is the most active age groups of 3G mobile. In UTUAT model, five factors are used to study the adoption of mobile banking: Performance expectancy, Effort expectancy, Social Influence, Facilitating Conditions and Voluntariness. Facilitating conditions seem to dominate in this study. As we make easy to use services the adoption rate will increase. Creating awareness about the services is also important as discussed by many other researchers (Safeena, Date, Kammani, and Hundewale, 2012; Lin, 2010)

Cost as an attribute has been studied by (Sadi and Noordin, 2011), this study found out that perceived cost is also an important factor and has negative relation with the intention to adopt mobile banking services; therefore, this study suggests that the creative promotional and pricing strategies, including cost reduction should be implemented to attract more price-conscious customers. Singh, Srivastava, and Srivastav (2010), also argued that the financial cost incurred has a negative effect on the intention to use mobile banking.

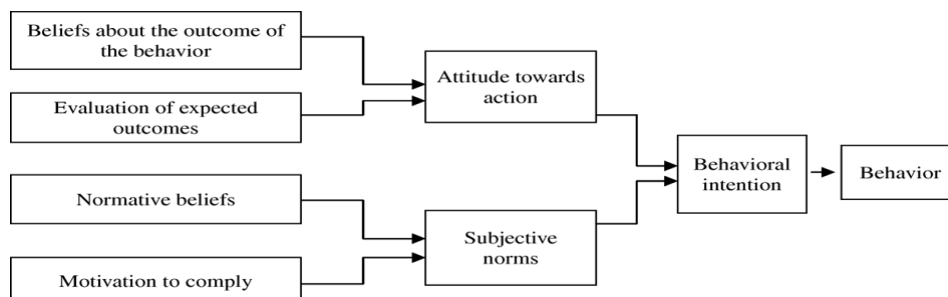
Researchers have come across many different models that help them in determining the important factors that affect the attitude and intention of the mobile banking users. In the next section those models have been discussed.

TRA, TAM, TPB, IDT and UTUAT Model

There are various models that help in study of adoption behaviour of mobile banking services. These models include various attributes that judge the intention of the mobile banking user and his/her attitude towards it. These models are: 1) Theory of Reasoned Action (TRA) 2) Technology Acceptance Model (TAM) 3) Theory of Planned Behaviour (TPB) 4) Innovation Diffusion Theory (IDT) 5) Unified Theory of Acceptance and Use of Technology Model (UTUAT).

Theory of Reasoned Action (TRA)

In the model proposed by Fishbein and Ajzen (1975) (see Figure 5) it was suggested that person's actual behaviour can be determined by the behavioural intention along with the belief and subjective norms that the person has for the behaviour. Subjective norms refer to *"an individual's perception of other's opinion about his/her particular behaviour, if he should perform a particular behaviour or not"* and attitude towards action is defined as *a person's positive or negative attitude towards this performed behaviour*. Thus, TRA is a useful model that can explain the actual behaviour of an individual. In 1985 Davis took the same model and extended it to the TAM and linked it to the user acceptance of an information system.

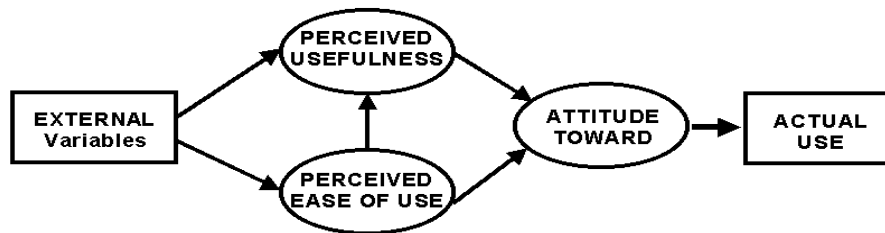


Source: Fishbein and Ajzen, 1975

Figure 5: Theory of Reasoned Action

Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) proposed by Fred Davis in 1986 (see Figure 6). Davis (1986) defined Perceived usefulness as “*The degree to which an individual believes that using the particular system would enhance his or her performance*” and Perceived ease of use is defined as “*the degree to which a person believes that using a particular system would be free of effort*”. According to him attitude of the user towards the acceptance of new technology or information system is determined by perceived usefulness and perceived ease of use.

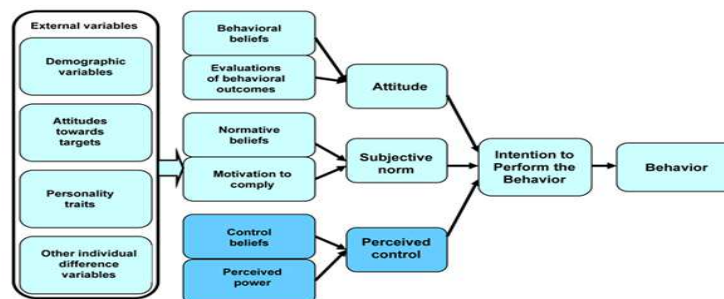


Source: Davis 1986, p. 24

Figure 6: Technology Acceptance Model Propped by Fred Davis

Theory of Planned Behaviour (TPB)

Theory of Planned Behaviour is an extension to TRA, it (see Figure 7) has taken into account one additional construct i.e. Perceived Behavioural Control (PBC). Perceived behavioural control refers to the people's perceptions of their ability to perform a given behaviour in a controlled manner. PBC is further influenced by control beliefs and perceived Power or perceived facilitation. Control beliefs refer to the perceived presence of those factors that may facilitate or impede the performance of behaviour. Perceived power specifies the power to have the resources that are required to use a specific system.



Source: Ajzen, 1991

Figure 7: Theory of Planned Behaviour

Innovation Diffusion Theory (IDT)

Rogers (2003) described the innovation-diffusion process as “an uncertainty reduction process” (p. 232) and he proposes attributes of innovations that help to decrease uncertainty about the innovation.

Attributes of innovations include five characteristics of innovations:

- Relative advantage
- Compatibility

- Complexity
- Trialability
- Observability

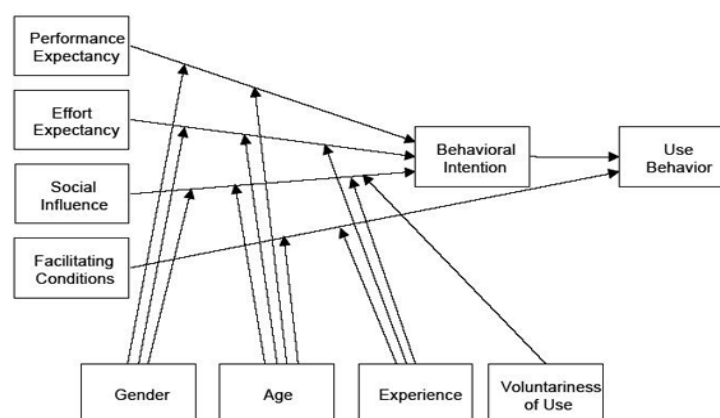
Rogers (2003) stated that “individual’s perceptions of these characteristics predict the rate of adoption of innovations” (p. 219). Rogers (2003) defined the rate of adoption as “the relative speed with which an innovation is adopted by members of a social system” (p. 221), Relative advantage as “the degree to which an innovation is perceived as being better than the idea it supersedes” (p. 229), “compatibility is the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters” (p. 15), complexity as “the degree to which an innovation is perceived as relatively difficult to understand and use” (p. 15), “trialability is the degree to which an innovation may be experimented with on a limited basis” (p. 16), observability as “the degree to which the results of an innovation are visible to others” (p. 16).

To summarize, Roger argued that innovations that offer a more relative advantage, compatibility, simplicity, trialability, and observability will be adopted much faster as compare to others.

Unified Theory of Acceptance and Use of Technology Model (UTUAT) Model

This model is based on the theories of individual acceptance that are synthesized by Venkatesh, Morris, Davis, & Davis, (2003), include the Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Motivational Model (MM), Theory of Planned Behaviour (TPB), Model Combining the Technology Acceptance Model and Theory of Planned Behaviour (C-TAM-TPB), Model of PC Utilization (MPCU), Innovation Diffusion Theory (IDT), and Social Cognitive Theory (SCT).

Venkatesh (2003), (see Figure 8) defined Performance expectancy as the degree to which an individual believes that using the system will help him/her to attain gains in job performance, Effort Expectancy as the degree of ease associated with the use of the system, Social Influence as the degree to which an individual perceives that important others believe he or she should use the new system and Facilitating Conditions as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system.



Source: Venkatesh et al. (2003)

Figure 8: Unified Theory of Acceptance and Use of Technology Model

DISCUSSIONS AND CONCLUSIONS

In the backdrop of above reviewed literature, it can be seen that the adoption of mobile banking services in India is just 2%. So it becomes important for the service providers to increase the rate of adoption of mobile banking users. Through the literature review some important points have been highlighted. It includes:

- Banks should create awareness about the mobile banking services through Advertisements, Pamphlets, Demo Fares, Campaigning etc. so that the customer feel informed and it may create interest among them. S.Samudra and Phadtare (2012), claimed that the footfalls at ATM centres is likely to be very high, the campaigns may be carried out at these locations to attract more customers towards these services.
- Trust is also an important point of concern. Trust between the customers and the service provider is very important, without security and privacy users will not use mobile for financial transactions.
- Perceived ease of use and perceived usefulness are found to be important factors to influence the consumer intention to adopt mobile banking. Hence, the main attention of management should be focused on the development of usefulness of system, trust building and cost reduction.
- Perceived cost is also an important factor; therefore, this study suggests that the creative promotional and pricing strategies, including cost reduction should be implemented to attract more price-conscious customers.
- It is also found that customers will adopt mobile banking if they find it easy to use and understand.

The users who are using banking services on their mobiles are highly satisfied ones, because of several reasons. The first reason is the availability of facilities of balance checking, access to account and card statement, checking recent transactions, ordering of cheque books, blocking of lost cards, etc. In the earlier times customers used to stand in the long queue in banks for money transfer, money deposit etc. but now mobile banking is providing facilities of anytime and anywhere banking. Security in the mobile banking services is also enhanced by the introduction of OTP i.e. one time password service in their mobile phones. Before the completion of any transaction you need to enter the OTP that is generated by the bank while the user is trying to initiate any mobile banking transaction and it is generated for one time use only as it expires after single use.

The above review shows that to fulfil the expectations of the consumers and to increase the mobile banking users, mobile banking service provider needs to increase the awareness about the mobile banking services. Banks and the mobile service providers need to come together to bring a revolution in the field of mobile banking.

REFERENCES

1. AL-Majali, M., & Mat, N. K. (2011). Modeling the antecedents of internet banking service adoption (IBSA) in Jordan: A Structural Equation Modeling (SEM) approach. *Journal of Internet Banking and Commerce*, 1-16.
2. Alpesh Patel. (2013). *M-Banking and M-Payments: The Next Frontier*. Delhi: Deloitte.
3. Bhatti, T. (2007). Exploring Factors Influencing the Adoption of Mobile Commerce. *Journal of Internet Banking and Commerce*, 1-13.

4. Chaipooipirutana, S., Combs, H., Chatchawanwan, Y., & Vij, V. (2009). Diffusion of innovation in Asia: A study of Internet banking in Thailand and India. *Innovative Marketing*, 27-31.
5. Chugh, V. (2014, 02 17). *Reserve bank of india*. Retrieved from RBI Website: http://www.rbi.org.in/Scripts/bs_viewcontent.aspx?Id=1660
6. Kalakota, R., & Robinson, M. (2001). *M-Business: The Race to Mobility*. New York: McGraw-Hill Companies.
7. Kapania, H. (2012-13). *COAI Annual Report 2012-13*. Delhi: Cellular Operators Association of India.
8. Kim, G., Shin, B., & Lee, H. G. (2007). Understanding dynamics between initial trust and usage intentions of mobile banking. *Information Systems Journal*, 283–311.
9. Lin, H.-F. (2010). An empirical investigation of mobile banking adoption: The effect of innovation. *International Journal of Information Management*, 252-260.
10. Mr. V. Vaidyanathan. (2008). *ICICI Bank launches iMobile: First bank in India to introduce complete*. MUMBAI: ICICI Bank.
11. *Reserve Bank of India*. (2014, 02 17). Retrieved from RBI Website: http://www.rbi.org.in/scripts/bs_viewcontent.aspx?Id=2463
12. Rogers, E. M. (2003). *Diffusion of Innovations*. New York: Free Press.
13. S.Samudra, M., & Phadtare, M. (2012). Factors Influencing the Adoption of Mobile Banking with Special Reference to Pune City. *ASCI Journal of Management*, 51-65.
14. sadi, A., & Noordin, M. F. (2011). Factors influencing the adoption of M-commerce: An exploratory Analysis. *International Conference on Industrial Engineering and Operations Management*, (pp. 492-498). malaysia.
15. Safeena, R., Date, H., Kammani, A., & Hundewale, N. (2012). Technology Adoption and Indian Consumers: Study on. *International Journal of Computer Theory and Engineering*, 1020-1024.
16. Sahin, I. (2006). DETAILED REVIEW OF ROGER'S DIFFUSION OF INNOVATIONS THEORY AND EDUCATIONAL TECHNOLOGY-RELATED STUDIES BASED ON ROGERS. *The Turkish Online Journal of Educational Technology*, 14-22.
17. Singh, S., Srivastava, V., & Srivastav, R. (2010). Customer Acceptance of Mobile Banking: A Conceptual Framework. *SIES Journal of Management*, 55-64.
18. TRAI. (2013). *The Indian Telecom Services Performance Indicators*. Delhi: Telecom Regulatory Authority of India.
19. Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 425-478.
20. Vinayagamoorthy, A., & Sankar, C. (2012). Mobile Banking –An Overview. *Advances In Management*, 5(10), 24-29.

APPENDICES

Table 1: Comparison of Models

Models and Theories	Constructs
Theory of Reasoned Action (TRA) by Fishbein and Ajzen (1975) derives from psychology to measure behavioural intention and performance.	Attitude Subjective norm
Technology Acceptance Model (TAM) by Davis (1989) develops new scale with two specific variables to determine user acceptance of technology.	Perceived Usefulness Perceived Ease of Use
Theory of Planned Behaviour (TPB) by Ajzen (1991) extends TRA by including one more variable to determine intention and behaviour.	Attitude Subjective norm Perceived Behavioural Control
Combined TAM and TPB (C-TAM-TPB) by Taylor and Todd (1995).	Perceived Usefulness Perceived Ease of Use Attitude Subjective norm Perceived Behavioural Control
Innovation Diffusion Theory (IDT) by Rogers (1962) is adapted to information systems innovations by Moore and Benbasat (1991). Five attributes from Roger's model	Relative Advantage Compatibility Complexity Observability Triability
Unified Theory of Acceptance and Use of Technology Model (UTAUT) by Venkatesh et al. (2003) integrates above theories and models to measure user intention and usage on technology	Performance Expectancy Effort Expectancy Attitude toward Using Technology Social Influence Facilitating Conditions Self-Efficacy Anxiety

Source: Empirical Validation of Unified Theory of Acceptance and Use of Technology Model (Thanaporn Sundaravej)

