CHAPTER II
REVIEW OF LITERATURE

The literature pertaining to the current study on “Adoption and Usage of Innovative Techniques: A Study on Mobile Banking in Coimbatore City” is discussed in this chapter under the following heads

2.1 Scope of M-banking
2.2 Adoption of M-banking
2.3 Problems of M-banking
2.4 General Studies on M-banking

2.1 Scope of M-banking

Mobile banking is a type of m-commerce service since it allows consumers to perform services (i.e. banking transactions, balance enquiries and alerts) through their mobile devices (Corbitt and Barnes, 2003). Positive gains for consumers such as cost effectiveness, personalization and convenience has contributed to the increased adoption of M-banking over traditional banking methods. This section gives a brief account of the various studies which discussed the scope of M-banking.

According to Bagozzi (1992) appraisal use of m-services prompts his/her affective response, which predicts his/her post-adoption behaviours in coping strategies. This study examined consumers’ satisfaction with current m-services and their interest in m-services as the affective outcome and the subsequent coping response to the m-services use.

Harrison, T. (2000) reported that with the help of mobile banking, people can check the status of their fixed deposits. People can access the credit card statements and loan statements through mobile banking. Other account information such as insurance policy management, status of cheque and stop cheque payment etc can be done through mobile banking.

Mohr (2001) stated that checking account balance can be done through mobile banking. In mobile banking facility, one can check account balance anytime, anywhere by entering their PIN which is provided by the banks while opening the account.

Krueger (2001) said that mobile banking gained non-negligible relevance for banks. Mobile banking presents an opportunity for banks to retain their existing, technology-savvy customer base by offering value-added, innovative services. It might even help attracting new customers.

Suoranta and Mattila (2004) identified the benefits of mobile banking in Finland in terms of ubiquity coverage, flexibility, interactivity, and with greater accessibility compared to conventional banking channels such as Automated Teller Machine (ATM), and non-mobile banking.

According to Varshney.U and Vetter.R (2004) M-banking is the convenient, simple, secure, anytime and anywhere banking. They stated that many new e-commerce applications are possible and significantly benefit from emerging wireless and mobile networks.

Riivari (2005) discussed about how the European financial service providers are taking advantage of mobile services such as mobile banking and why has mobile banking becomes such an important financial tool for them. The paper through various examples showed that main factors leading to the use of mobile financial services by service providers consisted of improvements in customer service, reduction of cost, increased reactivity of the company, market share increase and reinforcing the brand image. The author concluded that mobile devices present the service providers with greater opportunities for offering more personalized services to their customers.

According to Ayadi (2005) mobile banking is considered to be one of the most value added and important mobile services available. The four user cases of mobile banking identified by the author were request of account balance, control of account movement, instant payment and account administration.

Park et al., (2006) stated that different benefits are distinctively associated with utilitarian or hedonic value perception in the context of consumers' mobile internet use. That is, convenience and information quality contribute to hedonic value while connection stability is positively associated with utilitarian value. Since m-services afforded consumer's various benefits from basic to innovative ones, different benefits of m-services will be differentially related to consumer's hedonic and utilitarian values.

InfoDEV (2006) analysed the “Micro-payment systems and their application to mobile networks.” The authors pointed out that mobile phone operators have identified M-banking/m-payments systems as a potential service to offer customers increasing loyalty while generating fees and messaging charges. The new services offer a way to move money from place to place and present an alternative to the payment systems offered by banks, remittance firms, pawn shops, etc. The article stated that the uptake of M-banking/m-payments systems has been particularly strong in Philippines, where three million customers use systems offered by mobile operators Smart and Globe.

Porteous (2006) asserts that mobile banking has the potential to be transformational owing to various facts. First, it uses existing mobile communications infrastructure which already reaches unbanked persons. Secondly it may be driven by new players, such as mobile phone industry operators, with different target markets from traditional banks who are able to harness the power of new distribution networks for cash transactions. These include anytime merchants, who extend the reach beyond the conventional tellers or ATM networks of banks. In addition it may be cheaper than conventional banking, if the offering is competitive enough.

For Tiwari, et al., (2006) M-banking has the provision and availability of bank related financial services with the help of mobile telecommunication technologies. The scope of offered services may include facilities to conduct bank and stock market transactions, to administer accounts and to access customized information.

Porteous (2006) distinguishes two aspects of mobile banking: additive and transformational characteristics. Additive aspects are those in which mobile phone is merely another channel to an existing bank account. Mobile banking is additive when it merely adds to the range of choices or enhances the convenience of existing customers of mainstream financial institutions. Transformational characteristics arise when the financial product linked to the use of the phone is targeted at persons who do not hold formal bank accounts with the conventional banking institutions.

Tiwari and Buse (2007) and Mukesh Mathur and Ashish shrimali (2010) stated that mobile banking can be said to consist of three inter-related concepts viz. mobile accounting, mobile brokerage and mobile financial information. Mobile accounting is

sometimes characterized as transaction-based banking services that revolve around a bank account and are availed using mobile devices. Not all mobile accounting services are however necessarily transaction-based. A more precise definition of mobile accounting would therefore characterize it as “availment of account-specific banking services of non-informational nature”. Whereas mobile brokerage, in the context of banking services, refers to intermediary services related to the bourse, e.g. selling and purchasing of stocks. Mobile brokerage can be thus defined as transaction based mobile financial services of non-informational nature that revolve around securities account. Mobile financial information refers to non-transaction based banking and financial services of informational nature. It includes subsets from both banking and financial services and is meant to provide the customer with anytime, anywhere access to information. The information may either concern the bank and securities accounts of the customer or it may be regarding market developments with relevance for that individual customer. The information may be customized on the basis of preferences given by the customer and sent with a frequency decided by him.

Tiwari R.S and Buse (2007) made a study on “The Mobile Commerce Prospects: A Strategic Analysis of Opportunities in the Banking Sector”. For them mobile banking refers to provision and availment of banking and financial services with the help of mobile telecommunication devices. The scope of offered services may include facilities to conduct bank and stock market transactions, to administer accounts and to access customized information. With mobile technology, banks can offer services to their customers such as doing funds transfer while travelling, receiving online updates of stock price or even performing stock trading while being stuck in traffic. The convergence of mobile communications and distributed networked computing has provided the foundation for the development of a new channel of electronic business and mobile business. The earliest mobile banking services were offered via SMS. With the introduction of the first primitive smart phones with WAP (Wireless Application Protocol) support enabling the use of the mobile web in 1999, the first European banks started to offer mobile banking on this platform to their customers.

Von Reijswoud (2007) reported that active use of m- banking/m-payments services may lead to indirect impacts, such as increased family savings rates,

increased incomes, and resilience to financial shocks. It could change the family dynamics concerning saving and sharing. It could lead to people staying away longer to make more money to send home in the form of remittance. The systems might reduce loss of money to petty theft and could increase people's sense of security in their communities. He further suggested that M-banking/m-payments systems may alter patterns of money-sharing within families by giving women greater autonomy and control over household savings.

Forrester Research Group (2007) reported that 219 million users would access the internet via mobile phone. The use of mobile phones for the implementation of electronic business transactions is additionally boosted by increasingly new technologies, such as wireless application protocol (WAP), blue tooth, as technological developments are changing daily. Mobile banking services or operations is still in their immaturity, leaving a great deal of room for development. There is a need, therefore, to understand user's acceptance and adoption of mobile banking and to identify the factors affecting their intentions to use mobile banking. This information can assist developers in the building of mobile banking systems that consumers want to use, or help them to discover why potential users avoid using the existing system.

Laukkane.T et al., (2007) analysed on how mobile banking services enable customers to request their account balance and the latest transactions in their accounts to transfer funds between accounts, to buy and sell orders for the stock exchange and to receive portfolio and price information. In that sense, electronic banking can be seen as a concept covering all the electronic modes of conducting banking actions, and mobile banking as a subset of electronic banking.

Ivatury and Mas (2008) stated that the financial institutions, which have had difficulty in providing profitable services through traditional channels to poor clients, see M-banking/m-payments as a form of 'branchless banking', which lowers the costs of serving low-income customers. Yet the government regulators see a similar appeal are working on the legal implications of the technologies, particularly concerning security and taxation, and an M-banking/m-payments system might be used within the context of the supplier/client relationship. There are some

efforts to use the mobile channel to service formal credit from banks or microfinance institutions, but these are not nearly as prevalent as stored-value or transaction and transfer facilities.

Adrian.D and Kamotha Njenga (2008) made a study on “Mobile banking usage experience in Kenya”. This paper is structured to offer strategic insights into the current state of mobile phone banking services as well as a review of emerging service provider, customer traits as well as tactical and policy implications. Illuminative causes are also featured to drive home the fundamental paradigms of concern in this study. The paper is based on a study conducted on existing mobile banking services in Kenya alongside mobile banking experiences of different countries. This paper is based on an analysis of the mobile phone based banking performance in terms of outlook and appropriate objectives. The study is carried out by a quantitative survey on M-banking services and demand. Data on usage and exploitation patterns was gathered through cluster sampling techniques using comprehensive questionnaires. The study concluded that the Kenyan mobile banking sector presents a delightful outlook of exploitation. Most individuals acknowledged the importance of the mobile based banking service in a myriad of their daily activities. Usage patterns appear to be largely driven by personal missions and marketing strategies of service providers. Depending on the nature of activities and requisite levels of expediency users will employ M-banking in variable ways.

Later, Huh and Kim (2008) conceptualized m-service benefits into two groups namely basic benefits and innovative benefits. Basic benefits represent consumers’ perception of positive experiences with their use of fundamental functions available with the mobility of mobile phones (e.g., communication via talking and/or texting). They call such benefits basic ones because mobility is what fundamentally distinguishes m- services available through mobile phones from traditional phone service as well as services via other electronic devices (e.g., desktop). For example, flexibility with location and time can be considered a basic benefit because it mainly originates from the “take-it-with-you” feature of mobile phones. On the other hand, innovative benefits concern consumers perception of positive experiences with their use of new and advanced functions working with the wireless functions of mobile

phones (e.g., video, internet, games, lifestyle applications, music players, and alternate forms of communication such as messenger and Nextel walkies).

Miller (2008) discussed the major drive for the successful financial innovation which has come from regulations and taxes. A Financial Innovation (FI) is defined as running a new process that reduces costs, reduces risks, or provides an improved product/service/instrument that better satisfies financial system participants' demands. This process includes several periods of volatility or stability. A mobile banking can be regarded as a financial innovation, as it reduces cost of reaching out the poor. The conditions in which innovations emerge can be the nature of technology, the structure and competitiveness of the industry, the economic environment of the industry and the regulatory environment of the industry. The diffusion of m banking is likely to be dictated by a multitude of factors; general and country specific. To develop and adapt technologies in mobile banking, the successful combination of two fundamentally different technological platforms; banking and mobile telephony is inevitable. As the interaction among stakeholders manifests that no single actor can launch an M-banking model and the M- banking may be seen as an innovation system made possible with all the stakeholders.

Samaneh Barati (2009) stated that technological development has reshaped the banking industry, which has become one of the leading sectors in utilizing new technology on consumer markets. Mobile communication technologies offer vast additional value for consumers' banking transactions due to their always-on functionality and the option to access banks anytime and anywhere. Various alternative approaches were used in analyzing customer's acceptance of new technologies. In this study, the author explored the factors which affect acceptance of mobile banking.

Vyas (2009) stated that Indian banks will target non-online banking users who may lack regular access to desktop internet but are very likely to own a mobile device, thus reporting great potential of mobile banking in India. The report of Vital Analytics suggested huge potential of mobile banking in India, as it found that urban Indian customers checking account balance is the most frequently cited reason for using mobile banking. Forty million urban Indians used their mobile phones to check their bank account balances followed by viewing last three transactions.

Mobile banking is the convergence of mobile technology and financial services (Chung and Kwon, 2009). M-banking is a subset of banking as it allows everyone easy access to their banking activities via mobile handset (Yu and Fang, 2009).

Anyasi and Otubu (2009) made study on “Mobile Phone Technology in Banking System: Its Economic Effect”. The authors studied the use of mobile phone in the banking industry, its economic implications, and in general a systematic look into the various forms of mobile banking with emphasis on the security measures that makes the whole process safe for adoption. The emergence of mobile banking technology systems has implications for the general discussions about mobile telephony in the developing world. Existing theory about the significance of mobile communications in the developing world has focused on voice and text messaging. The emergence of mobile banking also underscores how, occasionally, innovations emerged from unexpected places and have the capability of reconfiguring the significance of a technology to its users, offering a way to lower the costs of moving money from place to place and opening a way to bring more users into contact with formal financial systems.

Gu, Lee & Suh (2009) stated that the convergence of banking services with mobile technologies means however that users are able to conduct banking services at any place and at any time through mobile banking; thus overcoming the challenges to the distribution and use of banking services.

Mahesh Sharma and Ritvik Dubey (2009) discussed the “Prospects of Technological Advancements in Banking Sector Using Mobile Banking and Position of India”: The two technological advancements, viz the internet and the mobile phone have profoundly affected all in the last decade. Using a variety of platforms, services are being created to enable mobile devices to perform many activities of the traditional internet, albeit in a reduced format for mobile devices. One area of activity is mobile banking (one of the first areas of commercial transaction on the wireless internet). Banking is an area that has extended in many different ways in recent years, including telephone and online banking. M-banking provides yet another channel for banking services, and in emerging markets, provides some possibility for becoming a primary channel. Mobile banking, a symbiosis of technology and financial services is the hottest area of development in the banking sector and is expected to

replace the debit/credit card system, online or net banking in future. In the past two years, the number of people using mobiles has increased three times, as compared to the use of debit/credit cardholders. And, 85 to 90 per cent of mobile users do not own credit cards; there are 47 million mobile users, with 2 million being added every month. Despite such potential for convenience and business opportunity, few people use mobiles even for simple banking queries. The paper was focused on about mobile banking, its use and applications in bank sector. The technology required in mobile banking and some barriers like interoperability, fraud and security were also discussed in this paper. This paper examined the strategic implications of m banking and the strategic positioning of M-banking services in different markets. The paper concluded with a discussion of the future for M-banking services.

Sanayei and Ansari (2010) made a study on “Selection of the Appropriate Wireless Payment Technology in Mobile Banking”. The study reported that Wireless-payment systems and Stored-Value Card are the best overall payment scheme for mobile banking. A good payment protocol should balance the requirements of security and convenience. WAP (Wireless Application Protocol) one of the prevalent wireless technologies is being embraced by the banking sector. This leads to suggest that multiple usages can be added to m- payment systems with higher security merit so that they can gain a critical customer base. This study tried to compare the way of WAP, with other payment technologies and wanted to show that by using Analytic Hierarchy Process (AHP) method mobile banking could provide the goals of the users properly. The authors concluded that the success of m-payment technology depends on security cost for customer, cost for bank server, transmission speed, connection type and reliability, compatibility and usability factors. An AHP analysis was used to evaluate the performance of three m-payment technologies.

As Rani (2010) said financial inclusion denotes delivery of financial services at an affordable cost to the vast sections of the disadvantaged and low-income groups. People in developing countries have less option for transferring money and accessing banking services, because there is less deployed formal banking structure: fewer branches and ATMs generally co-located to relieve branches, low internet penetration and easy access to fast and immediate sources of loans but at high

cost. So a branchless banking channel using mobile phones could be far more preferable to poor people than the available options like travelling to and queuing at distant branches, forgoing their daily wages. Only about one-third of people living in developing countries have any form of financial savings with formal institutions. It is a proven fact that it lowers the cost of delivery to banks in building and maintaining a delivery channel and availability of funds to customers for accessing services. Hence, the developing countries, the author said, around the world concentrate more on implementing the mobile banking access to the unbanked mobile users, as a tool of financial inclusion, which is known as transformational mobile banking. Hence the success of mobile banking in micro finance depends upon the mass customer adoption, utility of mobile service for cash- in and cash-out transactions, interoperability of providers, a country's defined proportionate regulation and the ability of service providers to meet the regulatory challenges.

Mohapatra et al., (2010) studied the potential impact of M-banking, on the size of the remittance market-moneys remitted from the US to other countries by residents of the US. The remittance market size in 2010 was $325 billion and expected to reach $374 billion by 2012. Even during the economic downturn of the last couple of years remittance was resilient when compared to private debt and portfolio equity. The top ten recipient of migrant remittance in 2010 were four European countries and six countries with population over 90 million: India ($55 billion), China ($51 billion) Mexico ($23 billion), Philippines ($21 billion), France ($16 billion), Germany ($12 billion), Bangladesh ($11 billion), Belgium ($10 billion), Spain ($10 billion), and Nigeria ($10 billion). The vast volume of these remittances was conducted via M-banking which has reduced the cost of small amount transfers from about 10 percent down to 3 percent. This market was indicative of the potential size and impact that within-US M-banking could grow exponentially. For this reason, an understanding of factors that influence M-banking adoption within the US becomes paramount.

Mohammad A.Otair and Haroon Tarawneh (2010) stated that mobile phones as a channel to expand their brand competitiveness to attract new customers improve customer service and reduce costs. In Jordan the latest statistics showed that the percentage of mobile subscribers in Jordan was 76 percent of Jordanian people (who

are aged 15 years or more) in May 2010-offered by its four major network operators according to a report by the IPSOS Jordan for studies and researches. This paper developed and presented a mobile business solution based on stand-alone mobile application clients (called MB-MAC) for banks in Jordan. MB-MAC extends the convenience of existing online services- such as account balance information, funds transfer, and mini-statements- by making them accessible from any mobile device. As such with mobile services, a bank will need to hire even less employees as customer will no longer need to visit bank branches apart from certain occasions. The MB-MAC - designed to accommodate banks and customers' interfaces- was developed, implemented and tested successfully.

Dublin (2011) covered the mobile banking situation in India, the state of adoption by banks and the consumer mindset towards it. In India the mobile banking market is a recent development, yet it has grown since the introduction of the market. The Indian market can be divided into 2 segments: urban and rural. The urban mobile banking segment has shown a tremendous amount of growth yet has scope for improvement in the field of payment transactions. According to the survey conducted, majority of the customers in the urban segment widely use mobile banking service for checking account information and balances. The rural mobile banking segment has also been targeted and the market is fairly new, yet there has been growth.

Narendiran (2011) reported that the developments in mobile commerce applications make a revolutionary change in the banking services offering 'anytime', 'anywhere' banking. Mobile phones become a part in the life of a common man. Today, with the technological advancements in mobile communication and internet, the common man's day-to-day requirements are met at his doorstep. Mobile banking permits everyone in the country to access the banks for various transactions at their own places. The author cautioned to have security framework architecture to carry out mobile banking transactions. The framework will enable the developers to develop for accessing sensitive data over the wireless network through a Mobile Information Device Profile (MIDP)-enabled device. This architecture will help the users to access the banks and to perform secure transactions 'any time', 'anywhere' through their mobile devices.

Price Water House Coopers (PWHC 2011) showed that the total revenue expected from mobile banking is Rs 2600 crore by 2015. The report further states that m-banking could help banks as well as micro finance institutions (MFIs) to deliver and collect credit in a faster and cheaper way. The study concluded that mobile banking is the cost effective way of doing banking transactions but the study did not discuss the perception of consumers as well as awareness towards mobile banking services.

Sandeep and Pradip (2012) reported that almost all the banks in India provide mobile banking facilities to their customers and the mobile banking facilities offered by the banks are based on different types of platforms. There is a strong relationship between service qualities, perceived value with the customer satisfaction in mobile banking. There are several factors that determine the customer satisfaction of mobile banking in India and they are efficiency, security, cost effectiveness, fulfillment, problem handling and accuracy in results. The finding of this study stated that the reason for the high adoption rate of mobile banking among Indians is the cost effectiveness of using the services. All the banks provide free mobile banking services to their customers and the cost of GPRS enabled mobile phones is quite low. People do not need to pay huge amount of money to use the GPRS service in their mobile. All these things make the cost of using mobile banking service low.

Amiri Aghdaie and Faghani (2012) examined the relationship between mobile banking services and customer satisfaction in Iran by applying SERVQUAL model. The researchers used the customer satisfaction as the dependent variable and the five dimensions of service quality; namely, tangibles, reliability, responsiveness, assurance, and empathy, as the independent variables. Results showed that the four variables tangible (0.204), reliability (0.342), responsiveness (0.282), and empathy (0.345) had correlated with satisfaction significantly. However, the assurance factor had no significant relationship with customer satisfaction. The ANOVA test showed that there was a significant correlation between mobile banking services and customer satisfaction. The authors concluded that increase in service quality of the mobile banking could satisfy and develop customer satisfaction and ultimately retains valued customers.

Dhartibahen (2012) made a study on “Customer Perception towards Mobile Banking: Technology Adoption and Challenges”. He said that banking has redefined itself as customer centric; it becomes more important that the customer is happy with the services being provided. Unfortunately, the acceptance and adoption rates are very low even in the case of educated customers. The paper looks at various factors which explain why consumers are not using mobile banking and other technologies in banking. Objectives of this study are (i) focus on the adoption of mobile banking services by consumers and (ii) identify factors influencing the adoption and usage of mobile banking in India. The paper was based on exploratory research. Data were collected through questionnaire with mobile banking users and non-users. Various factors which contribute to the customer’s perception such as convenience, flexible virtual banking system, reliability, time factor, digital signature for security, user friendly, low transaction fees, anytime and anywhere banking facility, access to current and historical transaction data, facility of fund transfer to third party are taken for this study. The study reported that approximately 64 percent of the total respondents agreed that mobile banking has transaction related benefits and only 11 percent users strongly agreed that mobile banking is most reliable and 25 percent users agree with the statement. Out of the total respondents only 13 percent strongly agreed about the reliability of internet banking. The author concluded that mobile phones have immense potential of conducting financial transactions at much reduced cost. The author suggested that for inclusive growth, the benefits of mobile banking should reach to the common man at the remotest locations in the country.

According to Amaraveni and Prasad.K (2013), mobile banking certainly seems to be one of the biggest innovations along with CBS (Core Business System) and ATM in the field of banking and this will have a long lasting effect on how banking business is conducted. Automation of some routine work processes in banks in the mid-80's has moved on and resulted in business process re-engineering culminating in making banking services branchless, anytime and anywhere, facilitated new product development and enabled near real time service delivery. CBS and ATMs have enabled banks to provide banking services 24x7x365 but not really helped in expanding their reach to the unbanked or reach to the customer. At the end of January 2012 the total

wireless subscriber base was 936 million out of which, 313 million subscribers were from rural areas. Even ATM and internet banking have their limitations when it comes to penetration in rural areas. Mobile technology, which is low cost, ubiquitous and efficient with a potential to enable achievement the goal of deeper financial inclusion, has been recognised across the world. Any system has certain minimum features to attract customers and keep them engaged in the long run. Such features are ease of use, safety and security, accessibility and affordability. Mobile banking meets all these requirements but still the usage is nowhere near its potential.

Ritu Narwal (2014) stated that revolutions in telecommunications have enabled the launch of new access methods for banking services; one of these is mobile banking; whereby a customer interacts with a bank via mobile phone. In service use, mobile phones are no longer used as they have typically been used before. Talking and text messaging (SMS) will persist, but extensive service use is likely to grow. Mobile bank is a service provided by the bank that enables the user to receive information on the accounts and make monetary payments based on orders sent via mobile phone and SMS. It allows its customers to receive information on: account balances of the customer; transactions on the customer's accounts and currency exchange rates. The opportunity to use advanced technologies in service delivery has created challenges to developers of financial services; competitive advantage can be gained in the form of costs reduction or customer satisfaction increase or lost investing in wrong technologies. In order to upswing to the challenges, service providers are even more interested to enhance their understanding of consumer behavior patterns. The paper attempted to study the mobile banking overview, its issues and challenges. Mobile banking system is one which provides all daily banking operations to customer with one click of his mobile handset with supported application.

2.2 Adoption of M-banking

Many competing theoretical models coexist in the innovation acceptance and adoption literature, each with different focus and tested in different contexts. The various theoretical models on adoption of mobile banking are already discussed in the Introduction Chapter. This section gives a brief account of the various studies

conducted on adoption of mobile banking.

According to Delving (1995) the customers have less time to spend on activities such as visiting a bank and therefore want a higher degree of convenience and accessibility. The service quality attributes that the internet banks must offer to induce consumers to switch to online transactions and keep using them are perceived usefulness, ease of use, reliability, responsiveness, security and continuous improvement.

Sathye (1999) made a study on “Adoption of internet banking by Australian consumers: An empirical investigation”. Consumers go through ‘a process of knowledge’, ‘persuasion’, ‘decision’ and ‘confirmation’ before they are ready to adopt a product or service. The adoption or rejection of an innovation begins when the consumer becomes aware of the product. Consumer will seek out services which offer the best value for money. Hence, for adoption of mobile banking, it is necessary that the banks offering this service make the consumers aware about the availability of such a product and explain how it adds value relative to other products of its own or that of the competitors. An important characteristic for any adoption of innovative service or product is creating awareness among the consumers about the service, while the use of online banking services is fairly new experience to many people, low awareness of online banking is a major factor in causing people not to adopt online banking.

In the article on “Consumer perceived risk: Conceptualizations and models”, Mitchell (1999) stated that perceived risk is one of the critical factors to be focused while designing and developing a mobile banking service. Therefore, it is important for banks and service providers to project higher security when providing mobile banking services in order to yield higher consumers’ acceptance. In fact, banks and service providers should continuously innovate and offer better security and reliable applications to enhance users’ confidence towards mobile banking services.

Black et al., (2001) made a qualitative study on the adoption of internet financial services. Mobile banking is a form of service convergence enabled by innovative technologies. The authors reported that although personal characteristics have been identified as major predictors of consumers’ adoption of an innovation, several researchers have shown that it is the perceived attributes of the innovation itself,

rather than the characteristics of the innovators, that are stronger predictors of the adoption decision.

Al-Ashban and Burney (2001) pointed out that mobile phones and other handheld devices have been established firmly as an alternative form of payment in the technological advanced societies. Apart from the banks, the mobile service providers and operators are also putting efforts to promote and offer mobile payment services. The adoption of the mobile banking services has resulted in the innovation of new services in mobile banking.

Bradley and Steward (2002) found that the customer adoption is the main reason for the success of mobile banking across the world. Mobile payments are immensely used in many advanced countries. Mobile payments are defined as the use of mobile phone or device to make a payment from a payer to the receiver through an intermediary or without any intermediary.

Howcroft et al., (2002) reported that the respondent's level of education was not found to influence online and mobile banking adoption. The study also revealed that younger consumers value convenience or time saving potential of online and mobile banking more than older consumers. Younger consumers also regarded the lack of face to face contact as less important than older consumers.

Dahlberg and Mallat (2002) discussed the "Mobile Payment Service Development-Managerial Implication of Customer Value Perceptions". The authors stated that from customer's perspective adopting mobile banking services benefit in terms of convenience to perform banking transactions anytime and anywhere, with ease to use. Security is ensured, as banking transactions are encrypted and password-protected, ease of use, security, low transaction costs, and wide applicability of the solutions increase perceived customer value and should be managed by mobile payment solution provider.

Suoranta (2003) made a study on "Adoption of Mobile Banking in Finland". The author is of the view that mobile banking services should be valued and adopted by consumers. But the adoption by both banks and their customers is not straightforward because of organizational, perceptual and societal challenges. The

study pointed out that potential mobile banking adopter's societal circumstances, affecting his or her perceptions, will also affect his or her adoption.

Lee, McGoldrick, Keeling and Doherty (2003) discovered that the relative advantage of using 3G mobile banking services would increase one's self-prestige as what intended by young users. Another finding revealed that, the 'perception' and 'attitude' were the factors for mobile banking adoption. For instance, previous experiences of other mobile phone systems may generalize to beliefs about the ability to use 3G technologies for banking purpose.

Irwin et al., (2003) made a study on South Africa consumers which showed that four factors only affected the mobile banking adoption namely; trailability, lower perception of risk, customer needs and relative advantage. On the other hand, the researchers found that compatibility, complexity, mobile phone experience, facilitating conditions, and self- efficacy did not show any influence on mobile banking adoption.

Nex (2003) examined the impact of the relational plan on adoption of electronic banking. He pointed out that customer's trust towards the land- based bank was the key factor influencing the adoption of electronic banking service which was offered by the same bank. He also reported that the cumulative effects of customer satisfaction have a positive impact on the propensity to use electronic banking. He also found that satisfaction with the offline services would cause customers to experiment with and thus adopt electronic banking of their organization.

Lee et al., (2003) made a study on "Using ZMET to explore barriers to the adoption of 3G mobile banking services." Customers perceive location-free access and the ability to react immediately to the service need as important aspects of the creation of convenience and efficiency in mobile banking service consumption. Moreover, they state that the feeling of control is an important contributor in mobile banking in general. They also found that time utilization, accessibility and appropriateness creates convenience for consumers. In this study convenience was seen as consumer's ability to easily and conveniently use the service.

Chavidi and Mulabagula (2004) discussed the perceived barriers for the adoption of mobile banking services by the account holders of different banks in Malaysia. They found that the ease of access to relevant information or service is the

most important feature in mobile banking. The study concluded that complexity can be an influential factor in mobile banking adoption. Based on that banks need to minimize complicated procedures and need to enhance ease of use to attract more consumers.

Mallat et al., (2004) studied the diffusion pattern and adoption process of customers of a Finnish bank through administration of postal questionnaires. The sample respondents were divided into three equal sized groups consisting of non users, occasional users and regular users of mobile banking services. The study found out that the users are more interested in trying out mobile banking services. The study also found that users of internet banking are not enthusiastic about using the mobile banking services which shows that direct implementation of successful strategies in internet banking may not work in the case of mobile banking.

Shih & Venkatesh (2004) said that interest in future m-services results from the level of consumers' satisfaction with their current m-services experiences and captures the idea of reinforcement and enhancement of the current m-services adoption. This study focused on consumers' interest in future m-services that retailers deliver via mobile devices (e.g., receiving coupons and weekly ads).

Pikkarainen et al., (2004) made a study on "Consumer acceptance of online banking: An extension of the Technology Acceptance Model." Practically, users are more likely to adopt mobile banking if they believe using mobile banking will gain more relative advantages as compared to other traditional banking channels such as ATM or non-mobile internet banking. Hence, the authors felt that banks should emphasize the benefits that they can offer through this alternative banking channel. Specifically, competitive matrix should be used by banks to highlight the benefits over other banking channels.

Bauer et al., (2005) wrote an article on "Driving consumer acceptance of mobile marketing: A theoretical framework and empirical study." The findings showed that social norms have insignificant relationship towards the intention to adopt the service and slight influence on behavioural intention. Their study also found that personal attitude is a moderating factor for social norms to influence behavioural intention in adopting mobile banking.

Laforet and Li (2005) discussed the differences that exist between Chinese electronic banking consumers and consumers of other developed western nations. A sample of 128 respondents was used for the purpose of this study from six major cities in China through interview and promptings to a structured questionnaire. Responses were analyzed through t-test. The study found out that large differences exist between Chinese customers and customers of western countries in terms of demographic characteristics and their attitudes toward online and mobile banking. In the case of Chinese customers, the security risk associated with conducting banking transactions online was found to be a major deterrent towards the acceptance of online and mobile banking services. Another factor which emerged from the study hindering the adoption process was lack of clear understanding of online and mobile banking services by Chinese customers. Internet banking customers will have a normal tendency to adopt mobile banking technology.

Luarna and Lin (2005) proposed a modified technology acceptance model that included a trust variable (perceived credibility) to predict M-banking adoption in Taiwan. Yet their modification also included another variable, self-efficacy, and a form of trusting one's self.

Wu and Wang (2005) presented an extended technology acceptance model which integrated innovation diffusion theory, perceived risk and cost into the TAM to investigate what determines user mobile commerce acceptance. Data for the study were collected from the customers of four major private wireless telecommunication service providers, two leading domestic banks and two well known securities investment companies in Taiwan. Valid responses were received from 310 customers when questionnaires were sent. The descriptive statistics indicated that mobile phones are used mostly for 'convenience' stated by 99 percent of the respondents. Perceived usefulness and perceived ease of use indirectly influenced the actual usage through behavioural intention to use.

Laukkanen (2006) wrote an article on "Customer perceived value of e-financial services: a means-end approach." Consumer-perceived accuracy could be seen as the consumer's true value or the quality of nearness to the truth. Those consumers seeking

accuracy in their service consumption were worried about mistakes and wanted to be confident that mistakes will not occur. In this study perceived accuracy in mobile banking was considered as consumer's enhanced ability to ensure the accuracy of the service.

Amin, Hamid, Tanakinjal and Lada (2006) analyzed the willingness of the undergraduate students of a Malaysian University towards adoption of mobile banking technology. Their study tried to find out whether demographic variables such as age, gender and race had any effect towards the adoption process. The response of 615 students were studied through the one way ANOVA technique and the study concluded that differences exist in expectations regarding mobile banking between different age groups of respondents and also between different religion groups particularly between Muslim and non - Muslim students. Muslim students preferred reliable and right information disclosed by the banks and no interest elements in banking transactions whereas non - Muslim students prefer that there is no Arabic language in the brochure and they were not discriminated against by the banks. Gender differences between the respondents towards adoption of mobile banking were not significant.

Hanudin Amin et al., (2006) made a study on "Undergraduate students' attitudes and expectation for mobile banking" by interviewing 615 students of University Malaysia Sabah, Labuan International Campus through convenience sampling modes. They tried to find out the willingness on adopting the usage of mobile phone in banking transaction focused on Islamic banking in FT, Labuan. The findings illustrated that students tend to learn and adopt mobile banking in their banking transactions. In addition, the results also demonstrate student's attitudes and expectations to be the most consistent explanatory factors in predicting their willingness on adopting mobile banking usage in the future. The findings indicated that, the university students tend to change the way they do banking in the future. More than 80 per cent of the respondents claimed to be willing to adopt mobile banking in the future.

Gartner (2007) made a study on hype cycle for consumer mobile applications. The penetration rate of mobile phone banking is only about one to five percent of the target audience. From the perspective of banks that developed the mobile banking systems, a vastly improved number of customers must use mobile banking in order to

justify their investments and operational expenditure thus, understanding the determinants in the adopting behaviours of non-adopters of mobile banking is of high importance to marketing managers.

Laukkanen et al., (2007) investigated the resistance to innovation of mature consumers and how they differ from that of the younger consumers in the context of mobile banking. Their different approach is due to the fact that innovations imply a change from the routine and according to them it is more important to study the reasons of resistance to change than to focus on the reasons for adopting the innovation. They divide the reasons for resistance or the barriers into functional and psychological barriers. The functional barriers are divided into usage (fast, convenient and easy to use), value (economical) and risk barriers (loss of pin codes, battery life, wrong information, unauthorized access to information) and the psychological barriers are divided into image (image of mobile banking, perception of ease or difficulty in usage) and tradition (preference towards traditional channel such as physical visit to the branch) barriers. The authors designed and administered a questionnaire based on the theory of innovation resistance and a sample of 370 mature customers and 1155 young customers who had no previous exposure to mobile banking were collected and analyzed using factor analysis. The study showed that the two groups of customers differed on the barriers of risk, tradition and image. In the mature consumer segment, the value barrier emerged as the most important barrier.

Laukkanen (2007) focused on how the consumer preference differs between the different characteristics of internet and mobile banking channels. For the purpose of the study, two questionnaires were developed: one was administered to internet users and the other to those customers who have used mobile banking services along with internet banking. Two thousand one hundred and sixty nine responses from the first questionnaire and eighty one responses to the bill payment by mobile banking were obtained. Conjoint analysis was used to identify the utilities of the attribute levels and relative importance of the different attributes and cluster analysis was used to group the individuals into homogenous attribute preference segments. The cluster analysis shows that in case of internet banking users, at least 5 different customer segments can be found as compared to 4 different customer segments in mobile banking users. Thus

distinct groups in both user categories emerged. The study also showed that in case of internet users the screen size, location and response time are the most important channel attributes whereas in the case of mobile phone users location followed by size of the screen and the service response time are the most important channel attributes. Thus the study showed that the needs of both the user groups are different.

Judith Mariscal (2007) wrote an article on “Mobiles for Development: M-banking”. The emerging literature on mobile uses in developing countries has focused on the benefits of voice and text messaging. However, there is little academic research on mobile applications such as M-banking. While a large number of low income people have access to mobile phones; these groups are excluded from the financial market. M-banking offers the opportunity to diminish this financial exclusion by offering access to credit and to savings which are key tools capable of transforming the livelihoods of the poor and the efficiency of the market. Accessibility is the major barrier for the expansion of mobile adoption by the poor. There is an important role for regulators to play in enabling an appropriate environment for the increase in the mobile penetration as well as business models for M-banking.

Yang et al., (2007) made a study on "Understanding Consumers Expectations of Mobile Data Services in Australia". The study reported that established mobile infrastructure, service quality and service delivery would be important for the success of M-banking development and adoption in rural areas. Further geographical size is also found to play an important role for service providers in making an informed decision for providing M-banking service. For example the authors reported that a physically large country like Australia could support the provision of wireless services to serve a wider range of people considering its uneven population distribution in rural areas.

Ki soon lee et al., (2007) investigated the “Factors Influencing the Adoption Behaviour of Mobile Banking: A South Korean Perspective”. The authors studied the role of perceived risk, perceived usefulness, and trust in mobile banking adoption. This study modified the concept of the Technology Acceptance Model (TAM) within the context of mobile banking. It introduced “perceived risk” and “trust” in a proposed model to reflect consumers’ needs to use mobile banking. In addition to the

satisfactory fit level of their proposed model, they concluded that perceived risk indirectly influences adoption behaviour but only when it was via trust. Using the mobile banking service context, they also obtained strong empirical evidence for measuring perceived risks' dimensions. Evidence for a composite perceived risk variable was identified. They found the strong inhibiting effect of perceived risk on trust. This result encouraged the decomposition of the perceived risk variable into its theorized dimensions. The financial-performance risk dimension was proved to be the most salient concern for this sample and its context. Trust also had stronger influence on the adoption behaviour of mobile banking than perceived usefulness, which was used as an important variable in the traditional TAM variables.

Gimun Kim et al., (2007) studied 'Understanding dynamics between initial trust and usage intentions of mobile banking.' They stated that mobile banking is a form of service convergence enabled by innovative technologies. When a new innovative service is introduced, there is no direct prior experience to fall back on. The experience or knowledge-based trust that normally develops through iterative interactions may not exist. It is therefore expected that a person's initial trust, based on certain perceptive and possibly irrational forces such as cognitive cues, will play an important role in the decision to adopt mobile banking.

Lee et al., (2008) made a study on the factors affecting usage intention towards mobile banking using structural equation modeling. Factor such as perceived usefulness (PU) and perceived ease of use (PEOU) were found to be significantly affecting consumers' intention to use mobile banking. The findings further asserted that PEOU has greater impact than PU. This could be explained through the features of spontaneous system which results the construct of ease of use to be a strong determinant in mobile banking adoption.

Norazah Mohd Suki et al., (2008) analyzed the consumer's expectation and perception towards SMS Banking of Syariah. A self administered survey was developed and administered to 150 Syariah banking customers at Bank Muamalat Indonesia, Bank Mandiri and Bank Riau Syariah in Bintan Island Indonesia, resulting in 111 surveys being gathered with 74 percent response rate. Respondents came from a random sample of customers drawn from a database of three banks. Respondents provided

complete responses with 95.5 percent of them familiar with both Islamic and commercial bank transactions and also understand that SMS facilities could be used for banking transaction (65.8 percent). A small group of them used their mobile phone for SMS banking. The authors concluded that all the eight attributes (reliability of the new product, security, time and cost saving, advance technology, punctuality of the new product, educating customers in using the new product, customer friendly service and effectiveness) investigated were important for Syariah banks to take heed on when offering SMS banking activities to the Syariah Bank customers in Bintan Island Indonesia. Educating consumers on the usage of SMS for banking transaction could be a good solution to increase the usage of SMS banking as it allows banks and financial institutions to provide real-time information to customers. Security is one of key aspects needed to be further laid emphasis on by financial institutions.

Laukkanen and Pasanen (2008) examined how the innovators and early adopters of mobile banking usage differ from customers of online banking services. The study was done to see whether the mobile banking users form a different customer segment when they are compared with other online users. Responses were collected through online questionnaire which was administered to 320 users of mobile banking and 2355 users of internet banking. Logistic Regression was performed to see whether the users of mobile banking and users of other online banking services could be differentiated due to variables such as gender, age, size of household, household income, education and occupation. The results showed that mobile banking users can be differentiated from users of internet banking services through demographic variables of age and gender. Mobile banking users were likely to be males and older than the customers of internet banking. Since customers' segments of mobile and internet banking are not necessarily same or always overlapping, the marketers need to address the specific needs of the mobile banking customer segments through marketing strategies which may not be the same as in the case of internet banking.

Bangens and Soderberg (2008) revealed that M-banking is expensive to enter the M-banking world because they should have JAVA enable or windows based mobile handset, with GPRS, WAP or 3G system. Almost all M-banking softwares are either JAVA based or windows based and work thorough GPRS, WAP or 3G system of the

cellular service. But, recently it was now mobile handsets having the above stated facilities available for Rs.1500 onwards. Because of decreased price of mobile handset and service charges mobile communication is becoming increasingly affordable for the poorer segment of the population.

Grabner-Krauter and Faullant (2008) explained the reasons for banks to go for cell phone banking. It was because the penetration and diffusion of cell phones is high and this means that customers would have access to the service. Introducing cell phone banking to customers is valuable since such a technological service brings convenience to the customers, and offers benefits such as lower costs, saving time and making transactions anywhere.

Indrani Medhi et al., (2009) examined variations across countries in adoption and usage of existing M-banking services by low-literate, low-income individuals and possible factors responsible for the same. It is observed that variations are along several parameters household type, services adopted, pace of uptake, frequency of usage, and ease of use. Each of these observations is followed by a set of explanatory factors that mediate adoption and usage.

Crabbe et al., (2009) revealed two important findings regarding the role of income in mobile phone banking adoption. Firstly, the study found that a significant relationship exists between income and intention to adopt mobile phone banking. Secondly, in the study the non-users were over represented in the lower income groups. This finding can also serve as a sign of the role of income in adoption of mobile phone banking.

Yang (2009) investigated the factors relating to adoption of and resistance towards mobile banking technology in the university students of Taiwan. The study collected responses from 178 students on items such as system design safety, system base fees, mobile banking services and transaction fees, reply speed and fees and customer service of three mobile phone systems such as the STK (System Tool Kit), WAP and GPRS. The Rasch Measurement Model was used to analyze the responses collected. The study found out that factors such as speed of transactions and reduction in the transaction fees favoured the adoption process of mobile banking whereas factors

such as system configuration safety and system base fees led towards the resistance against adopting mobile banking services.

Gu et al., (2009) stated that utility expectancy and effort expectancy had significant relationships with behavioural intention. The analysis indicated that utility expectancy and effort expectancy were major factors influencing behavioural intention to adopt mobile banking. Users are willing to use mobile banking if they find it useful for their everyday life. Users also considered ease of use when adopting mobile banking.

Rajanish Dass and Sujoy Pal (2009) explored the factors affecting the adoption of mobile financial services among the rural under- banked mobile financial services. The authors further made an exploratory qualitative research among the rural-unbanked population in three states in India, one is the most economically progressive state, one is the most economically backward state and one falls somewhere in between the two in terms of economic growth. The study revealed that the demand for the core service (i.e. banking and financial service) along with the hardships faced by the population in availing such services through the existing channels of delivery, were prime drivers for adoption of mobile enabled financial services among the rural under-banked. The study further pointed out that the prime bottlenecks in the adoption of such services were lack of trust and low technology readiness.

Shan chu and Lu Yao-Bin (2009) wrote an article on “The effect of online-to-mobile trust transfer and previous satisfaction on the foundation of mobile banking initial trust.” The objective of this study was to find out the mechanisms associated with the initial formation of people’s trust in mobile banking and intention to use the service. The research was carried out on online banking customers who have available device to use mobile banking but never used it. A questionnaire was designed based on a seven-point Likert-type scale ranging from 1(strongly disagree) to 7 (strongly agree). Respondents included 525 Chinese college students who have the experience of online banking but never used mobile banking services. The respondents were volunteers and were not told the research’s objective. In all, 313 respondents were selected from them. The convergent validity and unidimensionality of each construct was verified using a principal component factor and analysis for factors with Eigen

values above 1, using a varimax rotation. Each item loaded on the intended construct with Cronbach's alpha exceeded 0.8. The study concluded that the trust in online banking is important to trigger customers' positive perception about mobile banking and the online-to-mobile trust transfer process provides a unified view for understanding the effects of online trust on mobile trust.

Ching Mun Cheah et al., (2010) wrote an article on "Factors Affecting Malaysian Mobile Banking Adoption: An Empirical Analysis." In their study they applied the Technology Acceptance Model (TAM). The data were collected through online survey and paper and pencil survey. Out of the 400 questionnaires sent only 175 were completed, recording a response rate of 43.75 percent. Using multiple regression and factor analysis techniques factors such as perceived usefulness (PU), perceived ease of use (PEOU), relative advantages (RA) and personal innovativeness (PI) were found positively related with the intention to adopt mobile banking services. Social norm (SN) was the only factor found insignificant. The study found that the extended TAM in the context of mobile banking with the inclusion of four new constructs namely; personal innovativeness, perceived risk, relative advantage and social norms, factor personal innovativeness (PI) is the most influencing factor in the adoption of mobile banking as PU, PEOU, RA and PR were found to be the factors that influence consumer's behaviour intention in adopting mobile banking. With the focus on the development of mobile banking facilities, the research provided valuable knowledge and information to banks, service developers and software engineers to enhance consumer's intention to use mobile banking services in future.

Tarek Taha Ahmed (2010) in the article on "An empirical examination of behavioural intention to mobile internet banking: The case of Egypt" explained how mobile internet banking has changed the business of retail banks significantly in terms of cost reduction and increased convenience for the customers. The study developed an empirically based model including factors, which have never been integrated into one framework, combining quantitative and qualitative methods to validate the factors that affect customer's behavioural intention to use mobile internet banking.

Riquelme et al., (2010) studied the moderating effect of gender in the adoption of mobile banking. They studied the other possible factors that might affect mobile

banking adoption such as perceived risk, perceived uncertainty, perceived system quality, financial cost, perceived usefulness and perceived ease of use. The findings illustrated that ease of use has a stronger influence on female respondents than male, whereas relative advantage has a stronger effect on perception of usefulness on male respondents. Social norms (or the importance of others in the decision), also influence adoption more strongly among female respondents than male.

Raleting.T and Nel.J (2010) reported that the slow adoption rate of mobile phone banking remains a dilemma for marketing managers globally. They stated that the earlier studies on mobile phone banking adoption behaviour lack investigation on low-income non- users' adoption behaviour and adoption behaviour with regard to a specific type of mobile phone banking application. Hence, this study investigated the attitude formation of low-income non-users towards Wireless Internet Gateway (WIG) mobile phone banking. A non-probability sample of 465 low-income non-users was drawn. The results of the assessment of the structural model indicated that considering the total effects, 'ease of use' and 'usefulness' almost influenced attitude with the equivalent strength. Other findings included that 'cost' and 'ease of use' influence usefulness of WIG mobile phone banking for low-income non-users, facilitating conditions and 'self-efficacy' influence 'ease of use', and that the total effect of facilitating conditions on 'ease of use' is relatively strong. Based on these findings practical suggestions were presented to enhance the adoption rate of WIG mobile phone banking in the low- income market segment. These findings provide marketing managers and practitioners with more insight into mobile phone banking adoption behaviour which is very useful in developing effective marketing strategies for WIG mobile phone banking. It is therefore imperative for marketing managers and practitioners of WIG mobile banking services to take cognizance of these findings and to consider the recommendations of this study.

Hanudin Amin and Ramayah (2010) made a study on "SMS Banking: Explaining the Effects of Attitude, Social Norms and Perceived Security and Privacy". This study aimed to investigate the factors influencing the use of Short-Messaging-Service (SMS) banking among Malaysian bank customers. It focused on the relationships among attitude, subjective norms, perceived security and privacy (PSP) and intention to use

SMS banking. They collected 115 valid survey responses. The data indicated that attitude, subjective norm, and PSP were influential predictors of intention to use SMS banking. The authors found that attitude, and subjective norms were significantly associated with intention to use SMS banking. These results substantiated Fishbein and Ajzen's (1975) theory, where attitude and subjective norms were the key predictors determining one's intention to use a particular system. The results, also, showed that PSP was an influential predictor to determine intention to use SMS banking.

Saifullah and Ahsanullah (2010) made study on "Modeling Choice of Mobile Technology for M-banking". The authors reported a more comprehensive framework to account for the explanations of consumer choice in the context of M-banking. The model underlies the cognitive processes of reasoning, referencing and contextualizing, as postulated in the behavioural decision making. The proposed theoretical framework is based on a review of literature from marketing, behavioural economics and information systems. The proposed model incorporated the concepts of choice, mobility, flexi-channeling and situation. Second, it provided a practical tool, which could generate useful insights for the marketing strategies of the banks and could enable them to increase their market share in a highly competitive consumer banking environment.

Puschel et al., (2010) made a study on "Mobile Banking: Proposition of an Integrated Adoption Intention Framework". The study integrated the Technology Acceptance Model (TAM), Theory of Planned Behaviour (TPB) and Innovation Diffusion Theory (IDT) to investigate the main factors influencing mobile banking adoption. By collecting data on usage of mobile banking from 666 usable sample units, they found that relative advantages, visibility and compatibility significantly impacted attitude; self efficacy and technology facilitating condition significantly impacted perceived behavioural control and perceived behavioural control, attitude and subjective norm significantly impacted intention to use mobile banking. The authors concluded that relative advantages significantly influence individuals' intention to adopt mobile banking.

Koenig Lewis et al., (2010) surveyed 155 consumers aged 18-35 in Germany on the usage of mobile banking services and uncovered that perceived usefulness, compatibility and risk significantly affected consumer intention to adopt mobile banking.

They found that perceived costs, ease of use, credibility and trust were not salient factors influencing behavioural intention to adopt mobile banking.

Myungsin Chae and Daesung Yeum (2010) studied the “Impact of Mobile Technology Paradox Perception and Personal Risk-Taking Behaviors on Mobile Technology Adoption”. The study focusing on mobile technology paradoxes developed coping strategies. As mobile technology is already a part of people’s daily life, it is inevitable that people need to utilize technology as part of their lifestyles. The study developed a research model on the relationship between mobile technology perception and choice of coping strategies, including personal risk propensity as a mediating factor. The analyses were conducted using PLS-Graph Version 3.0 for the study. A measurement model with eleven factors was constructed where the eleven factors consisted of five constructs (mobile technology paradox, stress level, coping strategy, risk propensity, self-efficacy, and risk preference). The finding of the study showed that mobile technology paradoxes could be a crucial issue for practitioners in the mobile industry because users’ frequent experience of the paradoxes could grow into an emotional issue, the perception on the paradoxes could be changed as users’ experiences with mobile technology becoming mature.

Foon and Fah (2011) in the study on “Internet Banking Adoption in Kuala Lumpur: An Application of UTATU Model” stated that the effect of effort expectancy was significantly amplified for old respondents, the effort of social influence was markedly amplified for young respondents, the effect of perceived financial cost was notably constrained to the respondents aged below 30 or over 50 and that the effects of performance expectancy and perceived financial cost on behavioural intention were more crucial to men. Besides, the respondents aged between 30 and 50 had better facilitating conditions for adopting mobile banking.

Rahmath Safeena et al., (2011) stated that mobile communication technologies provide immense additional scope for consumers’ banking transactions due to their always-on functionality and the option to access bank’s facilities ‘anytime’ and ‘anywhere’. Mobile banking is a subset of electronic banking which underlies not only the determinants of the banking business but also the special conditions of mobile commerce. It is the latest and most innovative service offered by the banks. But not

enough study has been done to know how customers perceive and evaluate electronically delivered mobile banking services. The study considered five factors perceived usefulness, perceived ease of use, subjective norm, consumer awareness about mobile banking and perceived risks associated with mobile banking. The study also pointed out that these factors have a strong and positive effect on customers to accept mobile banking system. Study concluded that majority of customers are accepting online banking because of many favourable factors. Analysis concluded that usefulness, ease of use, subjective norm, awareness and risks related to it are the main persuing factors to accept online banking system. These factors have a strong and positive effect on customers to accept mobile banking system.

Mohammad Taleghani et al., (2011) analysed "Factors influencing customers' decision to use cell phone banking based on SMS services". The study of this research included, speed, mobility access, propaganda, direction, adoption, self-efficacy, perceived cost, perceived risk, perceived usefulness, and perceived ease of use and intention of use. Establishment of priority for research variables showed that in respondents' opinion the level of perceived risk was the most important factor and the variables 'access speed' and 'self efficacy' were in the next ranks. Also it was observed that the four variables, viz., customers' 'perceived ease of use of mobile banking', 'perceived usefulness of mobile banking services' and 'perceived risk' and 'perceived costs' generally can forecast about 76 percent of variables of intention to use mobile banking services.

Kumbhar (2011) analysed "Financial Inclusion Through M-banking Services: Scope and Problems in India." using both primary and secondary data. Primary data was collected through interviews with the M-banking users and non-users. From the findings of the study the author reported that there is a need for M-banking for the financial inclusion of poor and urban people. But, because of various problems in M-banking system this is not widely accepted by Indian bank customers. Hence, the authors suggested the need to improve M-banking service including network coverage and security in M-banking.

In the article on "Determining Critical Success Factors of Mobile Banking Adoption in Malaysia", Norzaidi Mohd Daud (2011) examined critical success factors

that influence the adoption of mobile banking in Malaysia using extended Technology Acceptance Model (TAM). The proposed model was empirically evaluated by using survey data collected from 300 banking users concerning their perceptions of mobile banking. The findings indicated that this model could predict consumer intention to use mobile banking. Specifically, perceived usefulness, perceived credibility and awareness about mobile banking have significant effect on user's attitude that influences the intention towards mobile banking. The study concluded that these factors should not be ignored if banks are looking towards increasing mobile banking adoption and reducing cost of banking operation. The study would have important implications and is believed to be very useful for the Malaysian banking sector and also benefited the government since both will be aware of the relatively important elements that should be considered in formulating appropriate strategies and promoting mobile banking service thus obtaining the benefits from the system.

Dasgupta and Siddhartha (2011) discussed the "Factors Affecting Behavioural Intentions towards Mobile Banking Usage: Empirical Evidence from India". This study investigated the antecedents to behavioural intention of mobile banking usage of Indian customers. Further, a multiple regression analysis was undertaken to ascertain the impact of the antecedents over the behavioural intentions of mobile banking usage. The results showed that apart from traditional TAM variables like perceived usefulness and perceived ease of use, factors like perceived image, perceived value, self efficacy, perceived credibility and tradition all significantly affect behavioural intentions towards mobile banking usage.

Akshat Khatri and Sherah Kurnia (2011) made a study on "Mobile Banking adoption in Australian Rural Areas". This paper explored the viewpoint of service providers regarding the potential of mobile banking for rural areas in Australia as little work has been carried out in this context, particularly from the service providers perspective. It identifies some key issues with regard to M-banking development in rural areas, which are related to limited network coverage and technology acceptance among rural consumers. It also explains the differences in social context among developing and developed economies. This study enhances the current knowledge within the area of technology adoption in general and mobile commerce adoption

specifically. The study indicates that the rural areas of Australia have a completely different socio, economic, political and technical conditions from those of developing countries where one could see a rapid uptake of M-banking services under progress. The study suggested that M-banking does not appear to be relevant and offer a high potential for the rural residents in Australia. While the participating financial institutions acknowledge that M-banking complements other banking channels, it is not superior to the existing, more traditional channels especially in the context of rural areas.

Thamarai Selvan et al., (2011) discussed the "Behavioural Intention Mobile Banking in India: The Case of State Bank of India (SBI)". The objective of this paper was to investigate factors that influence SBI customers' adoption of mobile banking. The Technology Acceptance Model (TAM) used for this study was modified to incorporate the factors related to the mobile banking context. As in the original TAM model, perceived usefulness and perceived ease of use were addressed as the most important constructs in predicting information system (IS) acceptance in the work environment.

Hamza Salim Khraim et al., (2011) in the article on "Factors Affecting Jordanian Consumers' Adoption of Mobile Banking Services" made an attempt to identify the underlying factors that affect mobile banking adoption in Jordan. Data for this study were collected using a questionnaire containing 22 questions. Out of 450 questionnaires that were distributed, 301 were returned. In the survey, factors that could affect Jordanian mobile phone users to adopt mobile banking services were examined. The research findings suggested that all the six factors; self efficacy, trailability, compatibility, complexity, risk and relative advantage were statistically significant in influencing mobile banking adoption. The study concluded that perceived usefulness, ease of use, security and privacy, and customer attitude were significantly and positively related to customer adaptation.

Felix. Bankole et al., (2011) in the study on"Mobile Banking Adoption in Nigeria", conducted a cross-sectional survey through judgment sampling procedure. The respondents were mobile banking customers that consisted of students, and workers from diverse fields of employment. A total of 231 questionnaires as well as interview schedules were collected from the sample population of mobile banking customers. The data were analysed through statistics and qualitative techniques. This

article explored the factors that influence adoption of mobile banking in Nigeria. The study concluded that culture is the most important factor influencing the adoption behaviour of users of mobile banking in Nigeria. The results of the study provided some support for the model. Cultural values are playing a pertinent role towards mobile banking adoption in Nigeria. The authors reported that the results of this research offered some implications for other African countries such as South Africa, Mauritius, and Kenya.

Rammile and Nel (2011) wrote an article on "Understanding resistance to cell phone banking adoption through the application of the Technology Acceptance Model (TAM)". This study reported how the barriers of technology adoption influence perceived usefulness and perceived ease of use. The population of the study reported in this article consisted of 288 respondents who were non-users of cell phone banking services. The results of the assessment of the structural model demonstrated that both the value barrier and the tradition barrier had a strong negative influence on perceived usefulness. The usage barrier and the information barrier also had a strong negative influence on both perceived ease of use and the value barrier. Perceived ease of use had a strong positive influence on perceived usefulness and intention to use, while perceived usefulness had a strong positive influence on behavioural intention. Recommendations on how to improve the adoption of mobile phone banking are provided. The study pointed out that the value barrier and the tradition barrier strongly influence perceived usefulness negatively. The information barrier and the usage barrier influence perceived ease of use negatively. On the other hand, the value barrier is positively influenced by both the usage barrier and the information barrier. Finally, perceived usefulness and perceived ease of use positively influence behavioural intention.

Zohra Saleem and Kashif Rashid (2011) examined the relationship between customer satisfaction and mobile banking adoption in Pakistan. Using non probability sampling technique, data were collected from 150 bank employees and 150 bank customers. Through a constructed questionnaire, customer satisfaction was estimated by estimating an econometric model

$$CS= \alpha_0 + \beta_1 (OF) + \beta_2 (TF) + \beta_3 (SF) + \beta_4 (FF) + \beta_5 (EF) + \varepsilon$$

where: α_0-intercept, CS- Customer Satisfaction, OF- organizational factor, TF- technological factor, SF- strategic factor, EF-economic factor and ε – error term.

Factor analysis was incorporated as criteria for validity. A key finding of the research is that mobile banking is a critical service in banking industry. It further indicated that mobile banking adoption requires technologically efficient as well as cheap, reliable and secure technology development. In order to ensure that customers adopt the technology it must be efficient and quick as well as easy to understand and use. The study supports the hypothesis that strategic factor has the most significant and strong impact on customer satisfaction. Relative advantage of technology and the degree of service expansion significantly contribute to the factors for the variance. The practical implication of mobile banking depicts that there is a positive relationship between organizational factor and customer satisfaction. Results show a weak positive relationship between customer satisfaction and technical infrastructure. Furthermore, the type of decision making is the most contributing factor in bringing change in the dependent variable. The study supports the research finding that there is a negative relationship between economic factor which is associated with the usage of mobile banking and customer satisfaction. Cost of doing business and market risk were the most important measures of economic factor which affects the customer satisfaction.

Tashmia Ismail and Khumbula Masinge (2011) wrote an article on “Mobile Banking: Innovation for the Poor”. The authors focused on the factors influencing the adoption of mobile banking by the Base of the Pyramid (BOP) in South Africa, with a special focus on trust, cost and risk including the facets of risks: performance risk, security/privacy risk, time risk, social risk and financial risk. The study brought out the opportunities that mobile banking provides to reach under- banked or unbanked customers using mobile banking through the offering of new or significantly improved products and providing the market conditions needed to make the innovation work. The authors also provided insight for banks and mobile providers into the behaviour patterns of customers in low income markets, revealing that usefulness, ease of use, cost and customers trust in the service provider, are all critical when introducing services and products to customers to the BOP, spread of mobile banking in order to expand financial inclusion in low-income communities. The

study concluded that the propensity to use mobile phones and then to use them for mobile banking provide some basic indicators which could be produced as part of community profiles to which service providers could respond. Other variables measured in this study, such as trust and the influence of cost of mobile banking services could be considered for more comprehensive surveys, leading to indicators of use to industry and in support of public policy debate.

Solomon Negash et al., (2011) made a study on “Mobile Banking Adoption in the United States: Adapting mobile banking features from low-income countries.” The authors investigated the adoption of M-banking in a University in the southeast United States which has more than 24,000 students. The study aimed to collect data from the students of low income countries there by forming a framework that compares US adoption patterns to those in low- income countries. The objectives of the study were (i) identification of the core M-banking features evidenced in the dominant M-banking solutions within low-income countries (ii) identification of a theoretical framework for M-banking use, and (iii) an empirical study to understand the adoption of M-banking in the US as contrasted to its adoption in the low-income countries. The data was collected among 84 college students in the US; and was analysed, using partial least squares (PLS) modeling technique. The study concluded that ‘perceived ease of use’ and ‘perceived usefulness’ impact user’s intention to use mobile commerce ‘Perceived enjoyment’, ‘trust’, and ‘security’ and ‘privacy’, constructs that are found to impact use in other technologies were not supported. The authors felt it could be because majority of their participants were youth. The authors did not evaluate the age construct in this study. The other constructs ‘value network quality’, ‘degree of dependence’, and ‘mobile network quality’ were also not supported.

Michael Klein and Colin Mayer (2011) made a descriptive work on the revolution in mobile banking in Kenya in their article on “Mobile Banking and Financial Inclusion: The Regulatory Lessons.” The study presented a comprehensive and applicable scheme to assess regulatory approaches to new forms of financial transactions enabled by mobile technology in low income countries. The paper described the key elements of mobile banking and the various regulatory approaches to the risks inherent in the different components of financial services. The paper

summarized a basic approach that could be taken to assessing regulatory and competition policy implications of 'mobile' payments and saving services and discussed the wider implications of the analysis for the regulation of banking and financial services in developed as well as developing economies.

Joohyung Park et al., (2011) investigated the "Consumers Post-Adoption of M-Services: Interest in Future M- Services Based on Consumer Evaluations of Current M-Services." This study explained how utilitarian and hedonic values derived from consumers' basic and innovative benefits of m-services influence their post-adoption satisfaction with current m-services and the impact of post-adoption satisfaction on interest in future m-services in the context of young customers mobile phone use. The authors collected data through web-based survey approach and the sample comprised college students, viz., young adults from 18 to 29 years of age who are the most active users of various types of m-services. The questionnaire consisted of five parts viz., m-services use, m-services benefits (basic and innovative benefits), m-services consumption value (utilitarian and hedonic values), satisfaction with current m-services and interest in future m-services and demographics. The authors reported that both utilitarian and hedonic values of m-services (appraisal) derived from perceived benefits have a positive impact on satisfaction with m-services (emotional response), leading to interest in future m-services (coping). The study concluded that perceived hedonic value of m-services comes from basic as well as innovative features-driven benefits, while perceived utilitarian value only draws from basic feature-driven benefits.

Singh Manju and Behl Abhishek (2011) reported that Interpretive Structural Modeling (ISM) was proved to be an approach which drives the officials to study various aspects and interconnections of issues related to the structural modeling for mobile banking in rural India. ISM of drivers would bring out factors like 'requirement for customer retention for telecom companies', 'improving efficiency by saving cost', 'readiness to get updates' as some of the key participants. On the other side of the coin 'mutual understanding between banks and telecom partners', 'reach of partnership between banks and telecom operators', 'quality of network and quantity of bank branches' proved to be few of the factors with highest impact in making mobile banking

as a flow show in recent times. The findings of the study showed a wide range of factors relevant for mobile banking implementation and finalized a list of eleven barriers and eleven drivers of m-banking/payments services in India. After identification of factors, industry experts were consulted for understanding the contextual relationship among factors. Further, experts could either say that there was a relationship between a given pair of factors or the two factors were not related to each other. The ISM method did not allow for partial relationships or for factoring in the probability of impact/dependence of one factor on the other.

Chian Son Yu (2012) investigated the 'Factors Affecting Individuals to Adopt Mobile Banking: Empirical Evidence from the UTAUT Model'. In the study he employed the Unified Theory of Acceptance and Use of Technology (UTAUT) model to investigate what impacts people to adopt mobile banking. Through 441 respondents, the study empirically concluded that individual intention to adopt mobile banking was significantly influenced by social influence, perceived financial cost, performance expectancy and perceived credibility, in their order of influencing strength. The behaviour was considerably affected by individual intention and facilitating conditions. As for moderating effects of gender and age, the study discovered that gender significantly moderated the effects of performance expectancy and perceived financial cost on behavioural intention, and the age considerably moderated the effects of facilitating conditions and perceived self efficacy on actual adoption behaviour. The author concluded that the perceived financial cost and perceived credibility are two crucial factors influencing people's intention to adopt mobile banking.

Soo Yeong et al (2012) explored the underlying motives of mobile banking services adoption. Three sessions of focus group interviews were conducted and the results suggested that perceived advantage over other mediums, perceived risk, usage complexity, past experience and awareness were potentially influencing the adoption of mobile banking. The findings of the study revealed that the number of users adopting the service was novel as this phenomenon (i.e., network externalities) that borrowed from economics has been largely neglected in the marketing literature. The authors concluded that the study provided the initial foundation towards building a promising theoretical framework which was needed to assess mobile banking adoption behaviour.

Vishal Goyal et al (2012) reviewed the emerging research literature on m-banking. The authors reported the various challenges in the adoption of mobile banking in India as (i) economic challenges, (ii) regularity challenges and (iii) demographic challenges. Further the authors also stated the possibility of security threat that exists for transaction of payment using mobile device.

Nitin Nayak et al., (2013) wrote an article on "A Study of Adoption Behaviour of Mobile Banking Services by Indian Consumers". The main issue of this study was to understand the factors which contribute to user's intention to use the mobile banking services. The purpose of this review paper was to explore the factors that influence the adoption behaviour of mobile banking services by Indian consumers. This paper also discussed the various steps that mobile banking providers should take to increase their mobile banking service user's database.

Garima malik and Kapil Gulati (2013) investigated the perceptions of banks and customers regarding the adoption of M-banking technology by the use of a survey conducted in NCR (Northern Capital Region) during Feb-March 2012. A sample of two public sector banks was chosen including 300 bank customers who use mobile banking for the past six months. Data was analyzed using factor analysis and ANOVA. The findings revealed that mobile banking service is still in its fancy. Evidences showed that accessibility and security were the major hurdles in the adoption of SMS banking.

Sudalaimuthu and Angamuthu (2013) studied the influencing factors on adoption of mobile banking technology by the bankers of India. The study was carried out by sending questionnaires to the bank officers working in the bank branches of the public and private sector banks in Tamil Nadu State of India. Out of a total of 500 questionnaires distributed, 365 questionnaires with full response were used in the final study. The study found ten factors having high impact on adoption of m-banking technology. The simplified 10 factors out of the 31 adoption variables were (i) technical infrastructure, (ii) helps to check fraud related issues, (iii) service to unbanked center, (iv) cost of doing bank service, (v) customer awareness, (vi) crowd at the bank counters, (vii) reduce the number of employees, (viii) building customer's trust, (ix) financial support and (x) perceived relative advantage.

Sandeep Bhalchandra and Pradip Kumar (2013) stated that almost all the banks in India provide mobile banking facilities to their customers and mobile banking facilities offered by the banks are based on different types of platforms. There is a strong relationship between service qualities, perceived value with the customer satisfaction in mobile banking. There are several factors that determine the customer satisfaction of mobile in India and they are listed as efficiency, security, cost effectiveness, fulfillment, problem handling and accuracy in results. The paper further analysed the customer response and customer satisfaction of mobile banking through these factors.

Faisal Iddris (2013) investigated the perceived barriers in the adoption of mobile banking among consumers and assessed whether the usage of M-Banking is constraint on the basis of different demographic characteristics such as age, income level, mobile phone usage experience and marital status. Data were collected using convenient sampling via self-administered questionnaire in a university in the Ashanti region of Ghana. A total of usable 189 responses were collected from non-users of mobile banking and retained for analysis using SPSS version 16. The main reasons for rejecting M-Banking were explored using simple descriptive analysis, while chi-square test was used to assess the differences between socio-demographic variables and the rejection factors. The result indicates that majority of respondents do not use any kind of mobile banking service. The four main reasons for rejecting M-Banking were: M-banking requires knowledge and learning; M-banking attracts additional banking charges; poor telecommunication network; consumer preference for traditional means of banking instead of mobile enabled banking services. The author suggested to have appropriate marketing strategies to overcome the obstacles to mobile banking adoption.

Rasha Abd El.Aziz et al., (2014) explored and compared the dimensions and barriers that affect consumer's intention to use or adopt different self service banking technologies in the Egyptian context: Structured questionnaires were distributed to over 1500 respondents who were divided into three groups in order to investigate the usage of ATM, internet banking and mobile banking, using Chi square test, frequencies and cross tabulations. The results indicated that the three groups differed significantly with respect to usage, value, risk, tradition and image barriers. Moreover, significant relations between decisions of adoption with internet banking experience, level of

education, type of mobile owned and mobile internet experience were also noted. Findings of the study indicated that perceived ease of use, perceived usefulness, cost and the need for interaction significantly affected the usage of ATM, internet banking and mobile banking. However, perceived risk had significant effect between adopters and non adopters for ATM and mobile banking only. Moreover, the study concluded that there was significant difference between mobile banking adopters and non adopters with respect to level of education, mobile internet experience and type of mobile phone. There is no significant difference between adopters and non adopters with respect to age, gender and occupation. Consequently, the target market segment of mobile banking in Egypt could be described as the educated people that have good experience in mobile internet usage.

Mohammad et al., (2014) considered six factors viz., perceived usefulness, subjective norm, perceived ease of use, perceived credibility, consumer awareness about mobile banking and perceived risk associated with mobile banking when analysing the factors influencing the adoption of mobile banking services in Bangladesh. For the research purpose, a questionnaire was constructed to collect data from 70 respondents by using random sampling method. The study pointed out that the above stated factors have a strong and positive effect on customers to accept mobile banking system. The findings of this study revealed that perceived usefulness, subjective norm, perceived ease of use, perceived credibility, consumer awareness and perceived risk about mobile banking were the factors affecting the behavioural intention of mobile users to adopt mobile banking services in Bangladesh. The study further reported that mobile banking customers are increasing because it is comfortable with the digital lifestyle in Bangladesh.

2.3 Problems of M-banking

Mobile banking is a revolution that is driven by the world's one of the fastest growing sectors, viz; mobile communication technology. Like in any emerging technology, there exists barriers in the adoption of mobile banking services. A brief review on the various problems in the usage of given mobile banking, as discussed by different authors are given in this section.

Levine (1999) through his findings suggested that in the absence of a financial system that can provide the means for transforming technical innovation into broad implementation, technological progress will not have significant and substantial impact on the economic development. The fundamental issue about M-banking is its transformational nature.

Sarker and Wells (2003) assert that the only single access requirement or barrier to the resultant mobile banking will be the mobile phone. However, worldwide market penetration of affordable cellular devices and growing network service diffusion makes this intricacy almost fully resolved and setting a firm pedestal for mobile banking escalation.

Abubakar (2004) made a study on “Barriers to Mobile Internet Banking Services Adoption: an Empirical Study in Klang Valley of Malaysia”. The objective of the research paper was to study the perceived barriers that account holders of different banks in the klang valley of Malaysia face while using the mobile internet banking. Survey method was used to get results by surveying the account holders in banks offering or planning to offer mobile internet banking service in the klang valley of Malaysia. A total of 400 copies of questionnaire were distributed and 218 were returned of which 161 non users of mobile internet were banking which were useful in determining what are the barriers in adoption to mobile internet banking services. The data collected as a result of the survey was tabulated with the help of SPSS II version and to analyse the data different tools were used, such as, cronbach’s coefficient alpha and factor analysis, chi square test etc. From the findings of the survey, the author stated the problems in mobile banking as (i) size of display screen, (ii) level of security and (iii) cost of mobile phones.

Abhay Jain and B.S. Hundal (2006) made a study on “Barriers in mobile banking adoption in India”. Rapid changes in the financial services environment, increased competition by new players, product innovations, globalization and technological advancement have led to a market situation where battle for customers has become intense. In order to rise up to the challenges, service providers are even more interested to enhance their understanding of consumer behaviour patterns. This paper examined the forces that can act as barriers in mobile banking service adoption. A quantitative

survey sheds more light on this research issue. The data was collected from a survey in the Northern region of India and included 330 respondents.

Porteous (2006) stated that focus on the mobile banking environment requires both banks and Mobile Network Operators (MNOs) to deliver a transformation banking service to a consumer through the mobile phone. Faced with this challenge, policy makers and regulatory system may be tempted to defer action until clear good practice standards for regulated transformational M-banking have emerged. But evidences from the countries studied showed that the industry will not wait to innovate while policy makers and regulators deliberate over an ideal course of action with appropriate balance. Moreover, existing regulation, given that it was not developed with the convergence of telecommunications and finance in mind, typically leaves many gaps and ambiguities through which innovation might pass including innovation of a sort that should cause policy makers and regulators legitimate concern.

Gerrard et al., (2006) reported risk as the main factor for consumers not opting for internet banking. The various types of risks stated in the study are (i) physical risk, (ii) economic risk, (iii) functional risk and (iv) social risk.

Laukkanen (2008) made a study on “Determinants of Mobile Banking Resistance: A Preliminary Model” in Finland. An online survey was conducted among the internet banking customers of a large bank in Finland. A total number of 1597 valid observations were received. The results of the study indicated that the usage barrier, followed by image barrier is the most influential barrier to overall resistance to mobile banking.

Rolf H Weber and Aline Darbellay (2010) discussed the “Legal issues in mobile banking”. The authors pointed out that the use of mobile phones in order to effectuate banking transactions is bound to increase in a significant way in the near future. The growth in mobile financial services not only depends on technological advances, but also on consumer confidence in the provided services. Mobile financial services can be divided into mobile banking and mobile payment; therefore, legal certainty must be established as to what supervisory regime applies to the various activities involving banks and non-banks. Mobile banking activities fall within the scope of the banking business, and oversight is provided by the competent financial market authority for

prudential supervision, if the definition of banking activities encompasses all relevant mobile banking activities. Furthermore, legal aspects also play a role in the evolution of mobile banking as far as the need to enhance customer trust in the offered services is concerned. Major issues arise in relation to data security and consumer protection. Moreover, the outsourcing of certain key activities to mobile operators deserves further attention, as mobile operators can, under specific circumstances, become deeply involved in mobile banking.

Marc Rapport (2010) stated that security problems caused by banking applications created sometimes hastily before being uploaded for iphone, BlackBerrys and Android platform phones. Furthermore, mobile phones are small and easily lost and stolen, taking their stored credentials and text messages with them.

S.M. Sohel Ahmed et al., (2011) analysed the problems and prospects of mobile banking in Bangladesh. Among the total 120 respondents who were interviewed, 30 percent said that mobile banking could not save time and 44 percent replied that using mobile banking was costlier and 72 percent felt that it could be used only by upper class customers.

Prerna Sharma Bamoriya and Preeti Singh (2012) stated that mobile banking is a revolution that is driven by the world's one of the fastest growing sectors, viz., mobile communication technology. Like in any emerging technology, there exists barriers to the adoption of mobile banking services. The study explored the issues in mobile banking perceived critical for adoption by both mobile banking users as well as non-users. The study identified certain issues pertaining to banks, mobile handsets and telecom operators viz. mobile handset operability, security/privacy, standardization of services, customization, downloading & installing application software and telecom services quality. For this a descriptive design was adopted to empirically explore the selected issues. The study suggested that from customers' perspective, mobile handset operability, security/privacy and standardization of services are the critical issues. Although the research has its limitations, the implications of the results provide practical recommendations to the all concerned parties.

Seema P Joshi and Mateen Ahemad Sk Salim (2013) made a study on “Analysis of Barriers in Mobile Banking Services which Affects Consumer Utility and Bank Channel Cost”. The authors examined consumer adoption of a new electronic payment service as mobile banking and the factors influencing the adoption of mobile banking in India. The authors pointed out the barriers in the adoption of mobile banking. Mobile banking users are interested in having the information of various types like checking balance, reviewing mini statement and credit card balances. Transaction based services is not preferred by the customer due to security reason, network problem or insufficient operating guidance. The researchers found that most of those who frequently use mobile banking services, usually do not conduct much of financial transactions, but find the service very useful for information based transactions mainly checking account status. This means that mobile banking service is not solving the purpose it was originally made for, which is to provide customer convenience and reduce customer visits to the banks. Based on the findings, it is strongly believed that ensuring the security of mobile banking and familiarizing customers with how to use the service will definitely increase the rate of using mobile banking services.

Vanisree (2013) wrote an article on “Mobile Banking in India: Barriers in Adoption and Service Preferences”. The author pointed out the barriers in the adoption of mobile banking. the study focused on preferred services by the mobile banking customers and influence of demographic variables on mobile banking service adoption. A cross-section descriptive design was adopted and data collected was subject to product moment correlation, one way Kolmogorov-Smirnov test and frequency analysis. Findings reported customers security concern as the major barrier in adopting mobile banking services. The research also found that even most of those who frequently use mobile banking services, usually do not conduct much of financial transactions. This means that the mobile banking services is not solving the purpose it was originally made for, which is to provide customer convenience and reduce customer visits to the banks.

Karl Rieder (2013) in an article on “why mobile banking is considered unsafe?” listed the reasons for the customers most preferring mobile phones as (i) mobile phones can be easily lost or stolen; (ii) connecting to external networks and Wi-Fi hotspots provides a mean by which user credentials can be stolen and then used to

obtain access to the amount from any computer in the world, (iii) mobile apps are also exposed to viruses and other inadvertently downloaded malware which allow hackers to access information on the phone.

Ivalylo Ivanov (2014) stated that 90 percent of mobile banking applications have security problems.

Edwin et al., (2014) focused on the adoption and usage of the mobile phone banking services among banking customers in Nigeria and the associated problems. The aim of the study was to understand the levels of usage and non-usage of these financial services by customers within Nigeria. For the research, ten out of twenty one banks operating in Nigeria were selected. The stakeholders interviewed included bank staff, customers and students from higher education institutions. The findings of the study revealed that mobile phone banking was more established than internet banking and ATM services, but ATM services had a wider reach. In summary, the overriding factors affecting this situation included the cost and maintenance involved, education of customers, poverty and infrastructure availability. Recommendations are therefore awareness creation of the services and associated business environment, security improvement of the services and tough government regulations for general electronic banking services in the Nigerian context

2.4 General Studies on M-banking

This section gives a brief review of the general studies carried out on mobile banking.

In the paper on “Selection criteria for a mode of bill payment: Empirical investigation among Finnish bank customers,” Karjaluoto (2002) discussed the complementary services offered by the banking system, such as cheque books, ATMs, voicemail/landline interfaces, smart cards, point-of-sale networks, and internet resources, and how the mobile platform offers a convenient additional method for managing money without handling cash.

Anckar and D'Incau (2002) stated that eight features of mobile services (time-critical, spontaneous, entertainment, efficiency, mobility-related, cost saving, convenience, and familiarity features) determine two groups of m-commerce value, including mobile value and wireless value.

Liao and Cheung (2002) made an analysis on the "Internet-based E-banking and consumer attitudes: An empirical study." They found that individuals' expectations regarding accuracy, security, network speed, user-friendliness and user involvement and convenience were the most important quality attributes in the perceived usefulness of internet based e-retail banking.

Karjaluoto et al., (2002) investigated the bank customer's perception on private banking in Finland during the summer of 2000. The researchers claimed that the consumer segments of private banks in Finland could be classified into two categories. Firstly, the low frequency user's main trend for banking is via the branch and use of telephone to access accounts, which means online activities are rare (around 1-3 times a month). Secondly, the high frequency usage for banking is via internet, meaning that they bank online on a weekly or even daily basis. The finding also indicated that high frequency users for mobile phone, internet bank, ATM and others were those aged around 35-49 and the total was amounted 281, which were considered as profitable segment for banks.

Sein and Harindranath (2004) analysed a hierarchy of impacts of the ICTs: first order effects are simply counts of the actual number of ICTs in a population (penetration rates); second-order effects are direct increases in the phenomena associated with the technologies (more mobile phones lead to more phone calls, more M-banking leads to more banking); tertiary effects are systemic or social and are not very easily observed without careful analysis. An application of the use or ensemble perspective might uncover these tertiary impacts in a way that will strengthen the understanding of the role of M-banking/m-payments services in the developing world.

Branimir Dukić and Miroslav Katić (2005) wrote an article on "M-Order Payment Model via SMS within the M-banking." The authors found that it is necessary to work on constructing a theoretical model of payment via SMS as a rational basis for establishing

a pragmatic M-banking system. The model, resulting from the conducted research, encompasses the components such as ergonomics of using the system of payment via SMS, conceptual hardware system demands, systems of digital data exchange, concepts of interpolation safety, as well as the fundamental analysis of events and processes which occur within the mobile payment system.

Lyman et al., (2006) made two distinctions of M-banking: i) Bank led and ii) Non-bank led models. In the bank-based model, customers have a direct contractual relationship with a prudentially licensed and supervised bank or a financial institution. Under this model, a licensed financial institution, typically a bank delivers financial services through a retail agent, however using the technology for the delivery of M-banking transactions through agents who handle all customer interactions. The bank is the ultimate provider of financial services and is the institution in which customers maintain accounts. The bank-led model can use the services of business correspondent arrangement which is under pilot study in developing countries like India. The transformational m-services from South Africa Wizzit and MTN Banking are the best examples of bank led models. In the non-bank model, customers have no direct contractual relationship with a fully prudentially licensed and supervised financial institution. This virtual account is stored on the server of a non-bank. Whatever be the models, there is presence of all the players even in non bank led model where banks hold excess cash deposit to affect the m-transactions. The non-bank led model is one where a bank does not come into the picture, except possibly as a holder of surplus funds and in the non-bank, the Mobile Network Operator (MNO) performs most of the functions depending upon the partnership under each sub-models. The sub models of non-bank model are: joint venture model, third party providers and telecom led model.

Tommi Laukkanen and Teuvo Kantanen (2006) discussed “Consumer value segments in mobile bill paying”. The authors pointed out that consumer value differs between individuals. It was measured in the context with five items namely privacy, accuracy, convenience, control and efficiency. An internet questionnaire was developed and 82 usable responses from the users of mobile bill paying were collected. A five-point likert scale was used to measure the level of agreement with each statement and analysis of variance (ANOVA) technique was used. To group the

objects into homogenous groups, K-means clustering was used. The finding of this study shed more light on the value relations that predict mobile banking. Relations were discovered between privacy, convenience, control and efficiency. The results suggested that consumers differ at least in their privacy versus efficiency valuation.

Mavri.M and Loannou.G (2006) studied the “Consumer’s perspectives on online banking services.” The crucial factors that affect an individual’s decision to use or not to use online services are the age, the difficulties of using the internet, fear of changes in banking sector due to technological development and lack of information concerning products and services provided to customers through electronic delivery channels. Factors such as speed of transactions or the cost of using the internet have little impact on an individual’s final decision.

For Boyd and Jacob (2007) mobile banking and mobile payments describe distinct but in some cases overlapping sets of products. Some M-banking platforms provide services, such as money transfers, that are considered forms of mobile payment, while some m-payments products are so closely linked to bank accounts as the source of funds that they assume M-banking functions.

Felician ALECU (2007) reported that the future of mobile banking will be represented by such applications that support mobile, internet banking and EFT (Electronic Funds Transfer) transactions in a single user interface. In such a way, the mobile banking will be able to cover all the types of applications demanded at the market level. The parallel processing of credit card bank transactions could be performed with the help of a grid network. Excluding some limitations, the grid processing offers huge opportunities to exploit the parallelism.

Amir Herzberg (2008) proposed a modular architecture for secure transactions. This architecture consists of three independent processes. In the first process, the device identifies the user through physical possession, passwords or biometrics. The second process is authentication, which states that, the mobile provider authenticates the transaction request from the device via either subscriber identification or cryptographic mechanisms. The third process is secure performance according to which the transaction is performed by the mobile transaction provider, possibly with the help of the merchant and/or other transaction provider and may involve secure payment

protocols (such as internet based payments./secure electronic transactions, or IKP/SET), the mobile transaction provider is independent of the communication protocol in the mobile device.

Shruti (2009) made a study on “A Success Mantra for Mobile Banking in India.” This paper started with an overview of the existing system of M-banking and then examined the M- banking regulations in India and of the countries where (e.g. Philippines, Kenya, South Africa) M-banking payment system is already in practice or a success. The study reported three M-banking models of Kenya, Philippines and South Africa (SA). In the study, the author has brought out the differences between the bank based and non bank based models of M-banking. From the analysis carried out on the regulatory framework in different countries on M-banking, it was reported that the success cases of M- banking or payment are in those regimes where non-bank based models has been introduced. The authors stated that the regulations are very strict in India for mobile banking and if India wants to get more success they should follow the non-bank based model.

Radjou (2009) wrote an article on "Mobile Banking's Next Big Market: The United States,” which indicated that the M-banking implementations in low-income countries thrive because of the existence of an M-banking ecosystem that included financial institutions, wireless operators, and technology solution provider.

Chaipoopirutana, Combs, Chatchawanwan and Vij (2009) made a study on “Diffusion of innovation in Asia: A study of Internet banking in Thailand and India”. This study examined the possible attributes of innovation that contribute to the adoption of innovative internet banking services in India and Thailand. Diffusion of Innovation theory was utilized to study Indian and Thai banking customers living in several regions of the two countries. The attributes of innovation, used for this investigation, were complexity, compatibility, relative advantage and trialability. The findings of this study were that complexity had a negative relationship with intention to adopt innovative internet banking both in India and Thailand, while other attributes of innovation show a positive relationship. Several marketing related recommendations were offered for improving the success rate for the adoption of internet banking in both India and Thailand. The findings revealed that complexity was the only factor, which had negative relationship

with Indian and Thai customers' intention to adopt the Internet banking. On the other hand, compatibility, relative advantage and trialability had positive relationship with customers' intention to adopt internet banking. Compatibility had high positive correlation only among Thai customers. Trialability, relative advantage and compatibility had moderate positive correlation among the Indian customers, whereas trialability and relative advantage had moderate positive correlation among Thai customers. Complexity had low negative correlation among both Indian and Thai customers.

Vlad Miranda-Petronella (2009) stated that E-banking is the first of those banking services that really economize time, because it allows the user to accomplish from behind the computer many operations in the bank account, represents the computational solution that allows the holder to have access at distance at the capitals from his account, purposing to obtain information about his account situation and the situation of the effected operations, of the payment and of the capital transfers over a beneficiary by a computational application, of an authentication method and of a communicational average. The author stated that e-banking is absolutely necessary in the integration conditions.

Dr Amrit Patel (2010) made an analysis on "Harnessing M-banking Potential by Banks in Rural India". The author stated that mobile banking in rural areas of developing countries facilitates low-income people to access financial services (savings mobilization and withdrawals, loan disbursements and repayments, remittances, bill payments etc) without a branch infrastructure and manage high volumes of low value transactions with the aid of mobile phones and non-bank retail agents. Learning from international experiences, author suggested that Indian banks need to develop strategic action plan to harness M-banking potential to enhance customer convenience and satisfaction, facilitate unbanked, underprivileged and hard to reach customers to access financial services at reduced costs.

Salve Anup et al., (2011) made a "Survey on 2-Step Security for Authentication in M-banking". For this system they used M-banking, proposed the use of "steganography" as means to improve the communication channel. Task of enhancing security included construction of formula for both data encryption and for hiding pattern and also provided system based on biometric information. i.e., face recognition.

The study concluded that they proposed 2-level authentication process based on biometric information and steganographic approach which improved all identified drawbacks and provided more security for real life.

Al-Majali and Mat (2011) made an empirical investigation of success factors that could predict successful Internet Banking Service Adoption (IBSA) in Jordan through applications of Innovation Diffusion Theory (IDT). The research model consists of six exogenous variables: perceived ease of use, perceived usefulness, compatibility, trialability, trust and awareness and one endogenous: internet banking service adoption (IBSA). Seven hundred questionnaires were distributed to university staff and 532 data sets were collected. This represents 76 percent response rate. After rigorous data screening process such as outliers, normality, reliability and validity, 517 data were ready for structural equation modeling (SEM) analysis. Confirmatory Factor Analysis (CFA) was performed to examine the composite reliability, convergent validity and goodness of fit of individual construct and measurement models. The revised structural model demonstrates significant and positive direct relationships between all of six exogenous variables and IBSA.

Rajanish Dass and Rajarajan Muttukrishnan (2011) proposed a security framework for addressing the issue of trust on mobile financial services. The security protocol design has 3 main stages such as registration, authentication and authorization. The prototype was successfully evaluated using a number of known security checks such as hardware based memory attacks, phishing attacks, codebook attack and known key attack.

Rehaballah Elbadrawy and Rasha Abdel Aziz (2011) wrote an article on “Resistance to Mobile Banking Adoption in Egypt: A Cultural Perspective”. The authors stated that Mobile banking (m-banking) faces various types of resistance that may hinder customers’ adoption in Egypt. This study identifies three groups of m-banking non-adopters, namely postponers, opponents and rejecters. The objective of the study is to explore the reasons for resisting m-banking services in Egypt and whether it differs with regards to these customer groups. Accordingly, a questionnaire was distributed; Chi square tests, Kruskal-Wallis H tests and one-way analysis of variance (ANOVA) test, frequencies and cross tabulations were used. The results indicate that the three

non-adopter groups differ significantly with respect to usage, value, and image barriers. On the other hand, risk and tradition barriers did not show any statistical significance; however, risk barrier received the highest overall mean. Significant relations between usage, risk and image barriers with the gender and level of education were noted. Finally, findings enabled a clear mapping between Hofstede's cultural dimensions and the study's results.

Sharma and Singh (2012) identified the "Users' perception about mobile banking with Special Reference to Indore and around". There are some banks in India such as United Bank of India, State Bank of India etc. that uses 'one-time password' which is the latest tool to secure the mobile banking transactions. There are some stages of mobile security used by the banks. The first thing which is checked by the banks is the physical part of the handheld device. Indian banks do not use the smart card based security and that is why they check different physical components of the device. The application is a thick-client application which is used by most of the banks in India. If the device is stolen, the hackers need at least one ID or password to access the application. All the banks require authentication of the device with service provider before any transaction is initiated. It ensures that there are no unauthorized devices that are connected to perform the financial transactions.

Dr. Asmahan Altaher (2012) reported that mobile commerce supports automated banking services. However, the implementation of m-commerce services systems has become increasingly important in dynamic banking environment. He studied the relationship between technology acceptance model and m- commerce services. The results of the survey on 249 respondents in several Jordan banks revealed that technology acceptance model had a significant impact on m-commerce services. The results led to the recommendation that the technology acceptance model is a success model for support using new services for electronic commerce. In addition, managers play a significant role in influencing the mobile services in banks through social interaction. Managers should focus on relative advantage, usefulness, and ease of use, in order to develop the mobile commerce services implementation.

Muhammad and Shahzad Khan (2012) considered the market status for difference between mobile and internet banking. The worldwide improvement of information technology has affected the banking industry. In the banking segment the impact of information technology is the preface of internet banking and mobile banking. The internet has created an incredible market space; another technology is the mobile phone which has emerged to take more important role in business and society. Users' attitude and behavioural characteristics for internet and mobile bank were examined in the study. A structured questionnaire was sent to bankers and common mobile business executives who use their cell phone for financial transaction and check their balances on cell phones. The results revealed that the perceived usefulness of mobile banking and internet banking are same.

Devadevan (2013) wrote an article on "Mobile Banking in India- Issues and Challenges". The main objective of the study was to identify the mindset and to analyse the security issues in mobile banking among the banking customers in India. Primary data were collected using online questionnaire and secondary data were used from the website of Telecom Regularity Authority of India (TRAI). It was depicted from the study that the evolution of different technologies in communication system and mobile device is a major challenge to frequently change the mobile banking solutions. The author suggested that awareness creation among the existing customers and providing special benefits for using the mobile banking will increase the mobile banking users.

Atul Srivastava (2013) discussed about awareness of mobile banking services and their possible contribution towards sustainable growth. The research was carried out in two phases. In first phase the awareness level of customers regarding mobile banking services was analysed and in the second phase its possible contribution towards micro finance was studied. Findings of the study indicated that there is significant association between socio economic characteristics and awareness towards mobile banking services.

Vinod Kumar, Renu and Neha (2013) wrote an article on "Mobile Banking Services as Adoption and Challenges: A Case of M-Banking in India". They tried to find out the factors which influence customers' decision to use a specific form of mobile banking and specifically focuses on the evaluation of SMS based mobile banking in

India. They planned to connect the research gap in the acceptance of mobile banking among the customers. Main challenges are the positive and negative factors which influence the adoption of SMS based mobile banking. Second is focus on the adoption of mobile services by customers and usage of mobile banking in India. Third is a different technology behind mobile banking. Although the study has its limitations, the implications of the results allow in providing practical recommendations to the banking areas.

Mallikarjuna and Reddy (2014) discussed the “Conceptual Model for Assessing Service Quality of Mobile Banking”. The authors pointed out that the exponential growth in the use of mobile phones and drastic fall in the mobile data and SMS charges have paved way for yet another channel to provide banking services, viz., the mobile banking. They reviewed the theoretical foundations of service quality in the context of electronic banking and mobile banking to suggest a model for assessing the service quality of mobile banking.

Gurmeet Singh Saini (2014) wrote an article “Mobile Banking in India: Issues and Challenges”. For the study both primary and secondary data were used. The data was collected from 150 respondents from Delhi city in the month of November and December 2013. Around 61.33 percent respondents opinioned that using mobile banking is less costly and time saving.