



**NATIONAL LAW SCHOOL OF INDIA UNIVERSITY  
NAGARBHAVI, BANGALORE**

**DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF  
THE LL.M DEGREE ON**

**“MOBILE BANKING AND MOBILE PAYMENT SYSTEM – AN  
OVERVIEW”**

**UNDER THE GUIDANCE OF PROFESSOR N.L MITRA**

**Submitted by:**

**Khadeeja Naeem**

**I.D No: 368**

**Year: 2009 - 2011**

## **DECLARATION**

This is to declare that the dissertation titled “ Mobile Banking and Payment System” under Electronic Fund transfer, is the outcome of research conducted by me under the expert guidance of Professor N.L Mitra at National Law School of India University (NLSIU), Bangalore, for the partial fulfillment of the requirement of the award of the Degree of Masters of Law.

I further declare that my work is original except for such help as duly acknowledged and this has not been submitted either in part or whole for any degree or diploma at any other University.

10.06.2011



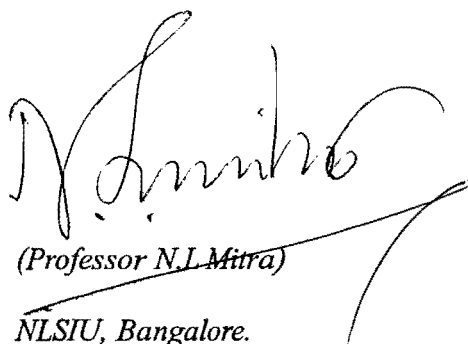
Khadeeja Naeem

I.D No: 368

NLSIU, Bangalore.

## CERTIFICATE

*This is to certify that this Dissertation “ Mobile-Banking and Mobile Payment System- An overview”, submitted by Ms Khadeeja Naeem (I.D No: 368) for the degree of Masters of Law (LLM) of the National Law School of India University, Bangalore is the product of bonafide research carried out under my guidance and supervision.*



*(Professor N.J. Mitra)*  
*NLSIU, Bangalore.*

*31 May 2011.*

## **ACKNOWLEDGEMENT**

*This acknowledgement is a small return in few word of appreciation and gratefulness to all those who have extended me the suggestions, help and corporation in every possible way during the course of my research.*

*I express my sincere and heartfelt gratitude and indebtedness to Professor N.L Mitra who guided me through my project, giving his expert ideas, suggestions in building my research work in spite of his busy schedule. His inspirational guidance direction was extremely instrumental improving the quality of my research.*

*I would also like to place on record my special thanks to the library staffs of NLSIU for their whole hearted corporation and support.*

*I further wish to extend my sincere gratefulness to my brother, who has been a pillar of strength to me in all my endeavors. I express my heartfelt gratitude to my niece who really assisted me in my project.*

*Lastly, I would like to make a special thanks to my friends who held me with the empirical study, without whose support, this endeavor would not be possible.*

## Table of Content

List of Figures .....	4
Introduction to the Study .....	6
BACKGROUND.....	6
AIM AND OBJECTIVE .....	7
RESEARCH METHODOLOGY.....	8
Chapter 1: An Introduction to Mobile Banking .....	9
1.1 DEFINITION OF MOBILE BANKING AND MOBILE PAYMENTS & MONEY TRANSFERS.....	9
1.1.1 Mobile Banking .....	9
1.1.2 Mobile Payments & money Transfer .....	10
1.2 CONCEPT OF MOBILE BANKING AND PAYMENTS .....	11
1.3 CHARACTERISTICS OF MOBILE BANKING .....	11
Chapter 2: Application of Mobile banking and Payments .....	14
2.1 MODELS OF MOBILE BANKING.....	14
2.2 MODELS OF MOBILE PAYMENTS AND TRANSFERS.....	16
2.3 MAJOR PLAYERS IN MOBILE BANKING .....	18
2.3.1 Payments Players .....	19
2.3.2 Mobile Telecommunications Players.....	20
2.4 THE IMPLEMENTATION OF MOBILE BANKING AND PAYMENTS	20
2.4.1 Security: .....	20
2.4.2 Interoperability:.....	21
2.4.3 Risks:.....	22
Chapter 3: Regulatory Framework.....	26

3.1	ROLE OF THE REGULATOR.....	26
3.2	BANKING REGULATION .....	27
3.3	BROADER FINANCIAL SERVICE REGULATION .....	27
3.4	KNOW YOUR CUSTOMER (KYC).....	28
3.5	ANTI MONEY LAUNDERING (AML) / COMBATING FINANCE FOR TERRORISM (CFT).....	29
3.6	CASE STUDIES.....	30
3.6.1	Asia 30	
3.6.2	Europe .....	35
3.6.3	Africa .....	36
3.7	REGULATORY DEVELOPMENT OF A SUCCESSFUL MODEL.....	39
Chapter 4: Mobile Banking in Maldives.....		41
4.1	COUNTRIES AND SECTOR BACKGROUND.....	41
4.2	MOBILE BANKING DEVELOPMENT IN MALDIVES .....	43
4.2.1	Raised Awareness .....	44
4.2.2	Considering the consumer.....	45
4.3	HOW DOES MOBILE BANKING WORK IN MALDIVES .....	49
Chapter 5: Issues and Concerns .....		51
5.1	REGULATORS' ISSUES WITH MOBILE BANKING.....	51
5.2	NETWORK COMPLICATIONS.....	51
5.3	ABSENCE OF UNIFORM STANDARDS.....	52
5.4	OTHER COMMON CONCERNS .....	52
5.5	WIRELESS CARRIER'S CONCERNS .....	53
5.6	FINANCIAL INSTITUTION CONCERNS .....	54
5.6.1	Security .....	54

5.6.2	Customer Authentication .....	55
5.6.3	Clearing and Settlement .....	56
5.6.4	Liability/Dispute Resolution .....	56
5.6.5	Customer Ownership and Funds Management .....	57
5.7	MAJOR TECHNICAL ISSUES IN MOBILE BANKING .....	58
5.8	MAJOR REGULATORY ISSUES .....	59
Chapter 6: Conclusion and Recommendations .....		61
6.1	CONCLUSION .....	61
6.2	RECOMMENDATION .....	62
Bibliography .....		64

**List of Figures**

Figure 1: Peoples awareness on mobile banking .....46

Figure 2: Adoption of mobie banking by customers .....47

Figure 3: Customers using mobile phones .....48

Figure 4: Customers currently obtaining bnk A/C .....48

Figure 5: Customers obtaining bank A/C in varios banks .....49

Figure 6: Use of ATM by customers .....49

Figure 7: Use of Mobile banking .....50



## ABSTRACT

Payments have been growing for hundreds of years and people have established advanced and more efficient means to make payment. Financial transactions that are based on wireless handsets may soon prove to be as pervasive as Internet-based financial applications. This progress has brought about a major shift in the current mix of consumer payments. Growth in this channel has been aided by technology, reliable infrastructure, applications, enhanced customer experience and traditional payment methods as well as new alternatives such as PayPal. The term "Mobile Finance" encompasses a wide array of services and products of interest to financial services institutions: Mobile Banking, Mobile Payments/Fund Transfers and Mobile Commerce. The common element is that the customer to initiate a financial transaction uses a handheld wireless device. Therefore the use of the mobile phone is the next significant step in the evolution in the payments industry.

However the future diffusion of mobile banking depends on the organizing of markets and the interplay with regulations. Thus mobile banking requires transparent and clear regulations, as the contracting parties do not necessarily know each other. The legal regulations imposed by the lawmaker, thus, intend to safeguard and balance both consumer- and business interests by setting rules and regulating the market as well as the usage of existing and emerging technologies.

Therefore this paper we examine of the current success in mobile banking and the legal and regulatory challenges that need to be met before financial institutions can safely deploy mobile transactions on a wide scale to the interested customers.

## **Introduction to the Study**

### ***BACKGROUND***

For hundreds of years payments have been evolving from the age-old bartering system, to cash, to check to electronic forms of payments and people have found more efficient ways to make a payment, resulting a shift in the current mix of consumer payments: from primarily paper-based such as cash or check to electronic payment methods. A key development in the industry was the emergence of the Internet as a channel for e-commerce. Previously consumers used the Internet as a means for information gathering have gradually adopted this channel for their purchase decisions and transactions. United States online retail reached \$175 billion in 2007 and will grow to \$335 billion by 2012.<sup>1</sup> Growth in this channel has been facilitated by advances in technology, trusted infrastructure and applications, and improved customer experience and payment choice such as traditional payment brands as well as new alternatives such as PayPal. We view the use of the mobile phone as the next significant step in the evolution in the payments industry – representing another growth opportunity for existing players and new entrants. As we have seen with e-commerce payments, technology innovation and the emergence of non-traditional market participants have added to the complexity in the industry.

Mobile banking and payments have developed through a number of parallel channels. Conventional banks and other financial institutions have expanded their services to include mobile banking service. The existing payment service companies have included mobile payments as their service. The telecommunication companies are benefiting from the increasing number of customers for mobile banking and payments and expand this service to the unbanked customers.

Mobile payments are of two types; where the customers link their bank accounts with their bank account. The second way is that telecommunication company act as a bank by allowing the customers to deposit and withdraw funds using mobile accounts. The non-bank has gained success in various countries like Japan, Philippines and Korea. The mobile payment technology is also to flourish in South Africa and Kenya.

### ***AIM AND OBJECTIVE***

**Aim:** The aim of the research is to study the application of mobile banking & payments and its regulatory framework

- To study the mobile banking implementation and process
- To find out the impact of the mobile banking in Maldives
- Finding out the regulatory frameworks and their issues in mobile banking and payment
- Recommending the possibilities to solve the issues for a better future of mobile banking and payments

### ***RESEARCH METHODOLOGY***

This paper uses the method of reviewing the available literature reviews. Some available empirical, applied and theoretical research is studied to provide an overview of the mobile banking and the payment system.

The project is based on reviewing the existing research since mobile banking is an upcoming service in most of the countries. However, a small primary research also was done through the Internet to the customer of Maldives. Since the time limitation fact the research was conducted via convenient sampling where the data is gathered from the customers who are easily reachable.

## Chapter 1

### An Introduction to Mobile Banking

#### ***1.1 DEFINITION OF MOBILE BANKING AND MOBILE PAYMENTS & MONEY TRANSFERS***

Mobile banking and mobile payments & money transfers are the two categories in mobile commerce. Mobile banking refers to situations where the mobile phone is used as an access channel to financial services. Mobile payments and money transfers refer to situations where the mobile phone is used as a payment device to affect the transfer of value from one party to another.

##### **1.1.1 Mobile Banking**

Mobile banking has already gained traction and there has been rapid expansion in deployment of applications. The number of mobile bank users has increased specially in the developed countries. It enables banking customers to check balances, transfer funds, and receive alerts. These alerts helps the customer to notify if certain conditions occur like if the account balance goes below the limit and if funds are required for future transactions.<sup>1</sup>

In addition mobile banking provides great value to consumers by providing ease accessibility and convenience for customer's portability, security, and enhanced functionality such as alerts to enable more proactive banking services. Earlier

---

<sup>1</sup> Edgar, Dunn & Company, "Realizing the full potential of mobile commerce", 2009, Sybase

customers had to physically go to a bank branch or ATM in order to make a transaction. The technology for corporate applications is still largely in development and represents an opportunity for future growth.<sup>2</sup>

### **1.1.2 Mobile Payments & money Transfer**

More interesting is how the mobile phone is being used beyond mobile banking to affect the transfer of value from one party to another. There is potential for huge transaction volume that could be initiated via the mobile phone and this transaction volume could generate important revenue opportunities for investors. The growth of the market can happen when there is an increase in number of mobile subscribers, versatility of the mobile device, continued rollout of contactless acceptance terminals, and breadth of income segments and geographic locations enabling access to mobile technology.<sup>3</sup>

Today mobile payments transaction volume there has been going through various developments throughout the globe. Completely new payment models have emerged in developing markets. In developed countries mobile phones are delivering safe and stable payments and money transfer systems but lack an extensive banking infrastructure. There are different types of mobile payments like mobile top up and physical mobile, which is based upon the reason why a payment is made. These payments are later discussed in this chapter.<sup>4</sup>

---

<sup>2</sup> Shi, N., "Mobile Commerce applications", 2004, Idea Group Publications

<sup>3</sup> Edgar, Dunn & Company, "Realizing the full potential of mobile commerce", 2009, Sybase

<sup>4</sup> "Mobile banking, mobile money and telecommunication regulations", LIRNEasia and UP-NCPAG

## **1.2 CONCEPT OF MOBILE BANKING AND PAYMENTS**

Mobile Banking is the term used for banking activities performed by using a mobile phone. A mobile payment is a part of mobile banking. It can be performed using SMS Messaging, mobile Internet or by downloading a special software.

By using the current models the customers pass transactions like making payments and perform other banking functions directly by using the mobile phone. The mobile banking can offer services such as checking balance statements and account history, managing other financial products like policies and pensions, stopping checks and reporting lost cards, international and domestic fund transfers and bill payments, peer-to-peer payments, mobile recharging, deposit and withdrawal at banking agents, loyalty related offers and location based services.

## **1.3 CHARACTERISTICS OF MOBILE BANKING**

Mobile banking service is noticeably different from the Internet banking in its approach to access and services.

**1.3.1 Convenience:** compared to other type of banking service mobile banking is much convenient. The customers do not have to queue up near the ATM machine unless they need to withdraw cash. People can use their cell phone just like credit or debit cards, which made it easier and simpler rather than using a PC to access Internet banking. Further mobile banking allows the customers to check balances, perform banking transactions without a passbook, apply for loans, do transfer funds, check exchange rate and monitor fraudulent activity.<sup>5</sup>

---

<sup>5</sup> Park, S., "Strategies and policies in digital convergence", 2007

Korea Telecom Fretel banking combines the mobile phone with a multi pack enabling easy access to mobile multi banking service for all kinds of banking by customers in spite of their location<sup>6</sup>.

**1.3.2 Efficiency:** mobile banking transfers significant economic benefits hence it improves competition within the financial market<sup>7</sup>. The expansion of financial institution via mergers and acquisitions has increased competition due to minimized obstacles in the industry among the financial institution. The banks hope to retain the recent customers and secure new customers to enforce their competition power.

Further the reduced banking cost due to the usage of mobile device is also an economic advantage since earlier the banking service incurred higher cost due to its dependency on brick and mortar and employees<sup>8</sup>. However, the introduction of mobile banking technology in the industry reduced the transaction cost.

**1.3.3 Security:** The primary factor that may be holding back customers from adopting mobile banking, are concerns about security. The issue is that whether mobile financial service providers are able to provide security to make sure the users and providers are fully protected from fraudulent activities and other threats<sup>9</sup>.

However, several issues arise regarding mobile banking security like consumers' security perceptions of mobile banking, obstacles to adoption of security policies based on these perceptions, issues faced by financial institutions, securing mobile channels etc.

---

<sup>6</sup> Korea Telecom Fretel, "KTF-Kookmin Bank Service Begins", FTF News, 2004.

<sup>7</sup> Kim, J., "The Impact Of Derivative Financial Market Expansion On The Central Bank's Monetary Policy", 2009

<sup>8</sup> Mashhour, A. & Zaatreh, Z., " A Framework for Evaluating the Effectiveness of Information Systems at Jordan Banks: An Empirical Study", 2008, Journal for Internet Banking & Com

<sup>9</sup> Nieto, M.J, " Reflections on the Regulatory Approach to E-Finance"



Since people usually use credit cards, ability to access funds through electronic medium through mobile devices, there is a high risk of crime through hacking<sup>10</sup>. Therefore, in case of a lost credit card, the cardholder may prevent the lost card from being used by using the mobile hence they provide service where expected amount of payment and payment approval information through a text message. This way it is safer and confidence to send account information to the cardholder whenever the lost card is used.

**1.3.4 Application:** Using the mobile communication systems, broader financial services like banking can be accomplished. Despite the debate on the current demand for the mobile banking, in UK the banks continue to test different solutions to find the a way that best fits to customer bases. In Korea the banks much concentrate in providing financial information rather than financial transactions whereby in Japan the wireless Internet is highly affordable thus enabling the financial transactions and as well as information and entertainment through cellular phone service<sup>11</sup>.

---

<sup>10</sup> Vamosi, R.,” Mobile Banking Security Watch: Don’t get burned by Viruses and Hackers”, 2007, CNET Reviews

<sup>11</sup> KTF Home Page, 2008

## Chapter 2:

### Application of Mobile banking and Payments

#### 2.1 MODELS OF MOBILE BANKING

Three determinants must be considered for a successful mobile banking model. The policy & regulation profitable business case for all sectors and the customer up-take. The policy & regulation is the very first step to set the mobile banking model. According to CGAP<sup>1</sup> there are mainly two types of models in mobile banking whereby both represents a new distribution channel that allows financial institutions and other commercial actors to offer financial services outside traditional bank premises. A wide spectrum of branchless banking models is evolving. However, yet the question arises regarding these models about the inter mediator acting between the end customers and the services like opening an account, deposit taking and lending etc where it is decided by the nature of the agency agreement either the bank or the non-bank.

The banking models are set based on inter mediator established the relationship to the end-customer.

- i. **Bank-based model** – in this model every customer has a direct contractual relationship with a licensed and supervised financial institution or a bank though the customer deals fully with retail agents who communicate directly to the bank either using a mobile phone or a point of sale terminal.<sup>12</sup>

---

<sup>12</sup> Rhyne, E., “Microfinance for Bankers and Investors: Understanding the Opportunities and Challenges of the market at the bottom of the pyramid”, 2009, McGrawhill.

- ii. **Non bank-based model** – unlike the bank-based model the customer does not have any contractual connection with the licensed financial institution. Therefore, the customer exchanges cash at a retail agent in return for the electronic record of value. It could also be a transfer of funds.

Accordingly to the mobile banking can be broken down further into five models based on how banks partner up with the telecommunication providers: (1) carries going solo. (2) Banks going solo, (3) exclusive bank and Telco partnership (4) bank telecom open partnership and (5) open federation model. Among the five models mentioned the most flexible and dynamic model is the federal model since it allows the partnership between all banks and telecom companies while sharing the same platform for m banking. The mobile banking coverage is then expanded by this platform and gives the unbanked the right to choose among the financial institution to maintain an account with.

In addition another difference lies in the nature of agency agreement between bank and the Non-Bank. The models of branchless banking can be divided further into three broad categories - Bank Focused, Bank-Led and Non-bank led model.

- i. **Bank-Focused Model:** this type of model is developed when a traditional bank uses non-traditional low-cost delivery channels to provide banking services to its existing customers. For instance the use of automatic teller machines (ATMs) to Internet banking or mobile phone banking to provide certain limited banking services to banks' customers. This is an additive model in nature and can be seen as modest extension of conventional branch-based banking.<sup>13</sup>

---

<sup>13</sup> Muralidharan, D., "Modern Banking: Theory and practice", 2009, PHI Learning Pvt Ltd.

ii. **Bank-Led Model:** this offers a distinct alternative to conventional branch-based banking. Instead of using the bank branches or bank employees, the customer carries financial transactions at whole range of retail agents by using a mobile phone. Thus financial services outreach considerably increases since different delivery channels are used along with different trade partners who have experience and targets a market dissimilar to the traditional banks. This may be cheaper than the banks based alternatives. Further this model can be implemented by using correspondent arrangements between Bank and the non-bank. In this model customer account relationship rests with the bank.

iii. **Nonbank-Led Model:** in this model the bank does not get involved unless it acts as safe keeper for the surplus funds. All the functions are performed by the non-banks or he telecommunication partner. Both Bank-Led and Nonbank-Led models are transformational in scope but the former is much less risky<sup>14</sup>.

## **2.2 MODELS OF MOBILE PAYMENTS AND TRANSFERS**

The use of mobile payment provides incredible values to the customers. The access to the payment through mobile banking creates ease and convenience to the customers thus reducing the need for physical cash.

**2.2.1 Remote Payments:** this refers to the purchase of goods and services remotely through the mobile device using SMS, browser WAP based or other exclusive application abilities. The payment for the digital contents like purchase of the ringtones can be made remotely. Also remote mobile payments allow to purchase

---

<sup>14</sup> Muralidharan, D., "Modern Banking: Theory and practice", 2009, PHI Learning Pvt Ltd

the goods from the stores to your door steps like ordering a book to be delivered to your home.<sup>15</sup>

**2.2.2 Mobile Top Up:** this is when extra minutes are added to the mobile device by using a debit/ credit card at the store through a scratch card or kiosk. This top up opportunity is noteworthy in markets where the majority uses prepaid mobile accounts.

**2.2.3 Person – to- person Remittance:** this refers to the transfer of funds between the mobile subscribers using a mobile device. This is also known as mobile money transfers. During the earlier days people pay each other by cash and check. However, remittance allows individuals with remote payments between the consumers by accepting cash physically and electronically transferring funds to a recipient location for a fee. Similarly the initiating money transfers via SMS with a mobile phone are more convenient and safe for the individual hence have been launched in numerous markets.

**2.2.4 Mobile Bill Payments:** this refers to the transfer of funds from an individual to a business using a mobile device for the purpose of bill payments. Mobile bill payments are most suitable in the developed markets over forms of internet bill payments. Thus mobile channels bring an important change over the market by forming a banking infrastructure.

---

<sup>15</sup> Faber, E: & Bowman, H., “Balancing Customer and Network Value of Mobile Payment services”, 2008, Springer Verlag Berlin Heidelberg

**2.2.5 Physical Mobile Payments:** this refers to the purchase of goods and services at the point of sale using a mobile device instead of using cash through a contactless technology. This is also referred as proximity payments. To initiate the growth of the physical mobile payment, agreement has been created around the standards for the mobile payments. However, though trials of physical mobile payments are ongoing, the adoption across the markets is not expected sooner. This is due to the requirement of more time and investments to implement contactless terminals at the point of sale, availability of commercial handsets and agreement among the participants upon the business models for both the bank and operators.

### **2.3 MAJOR PLAYERS IN MOBILE BANKING**

Mobile payment offering are provided by organization in totally two different and diverse industries. One organization is in the payments while other in the telecommunication industry. The mobile payment market consists of payment players inclusive of traditional banks, payment brands and processors, and established non-banks and mobile telecommunications players inclusive of mobile operators and start up technology provider. Thus the question arises over how the game will be eventually played since players are concerned about the customer ownership, the underlying transaction economics, and the share of the revenues generated from mobile payments.<sup>16</sup>

---

<sup>16</sup> Ulhenkar, B. &Gale, T., “ Handbook of research in mobile business”.

### 2.3.1 Payments Players

Among the payment players, traditional banks usually provide various electronic money movement services. Though they are interested in mobile banking, they are much concerned in committing to the new methods and technology of since the opportunity to generate revenue is lesser. Also mobile payments will only serve to cannibalize existing electronic payments, and thus will not yield any incremental benefits other than the substantial investment. It is also debated that mobile transaction can lead to fraudulent activities and financial losses to the bank thereby increasing the risk and cost of the migration.

The well-recognized brands have strong relationship with the financial institutions and dealers where mobile financial service offerings are practiced by most of them. However, these brands did have few dealing with the mobile network operators too since networks are relatively neutral to transactions coming through WAP and SMS and have fewer interest in small amounts earned from mobile payments. Nevertheless they are also concerned about the possible disintermediation of mobile networks towards their traditional fixed line networks. Their key objective is to make sure that financial institutions value propositions are maintained and security requirements relating to payment cards and fully complied with.

The established non-banks leads in niche markets especially in person-to-person remittance. They demonstrate good product innovation, pricing ability for services, and have a strong first-to-market mover advantage. Usually they either partner with banks or enter into banking themselves in order to access the payments system. Other than the online payments the providers face difficulty in perform real world payments without the presence of the dealer's point of sale.

### **2.3.2 Mobile Telecommunications Players**

Mobile operators controlled the remote payments market with SMS based micropayments that are billed to the operator bill. Most of the operators earn highest margin from the digital goods such as ringtones and games. Due to higher return the operators aggressively protect this franchise by sharing models with new partners. They expand with the intention to play a key role in the payments value chain. To date, mobile operators have successfully employed a walled garden approach that controlled both the access to merchants and the payment.

The infant technology providers are risk takers and entrepreneurial. They are not bound by banking rules and regulations and are backed by investment money which enables them to buy market share. They have limited brand recognition and do not have the ability to offer all functions along the payment value chain, and often must partner with others for end-to-end execution.<sup>17</sup>

## **2.4 THE IMPLEMENTATION OF MOBILE BANKING AND PAYMENTS**

A number of challenges like security, interoperability and risks are faced in the implementation of mobile banking services.

### **2.4.1 Security:**

The financial transactions security is carried out from some remote locations and using wireless transmission of financial information thus becomes a main challenge to all the parties involved; the application developers, wireless network service providers and financial intermediaries. Therefore, in order to perform a secure

---

<sup>17</sup> Ulhenkar, B. &Gale, T., “ Handbook of research in mobile business”.



infrastructure for the financial transactions over the wireless network the providers must look upon the

- The physical security of the mobile equipment used
- Security of the software application running in the mobile device for instance if the device stolen an ID needed to access the application.
- the authentication of the mobile device with the service provider before performing any financial transaction ensuring that only authorized mobile devices are able to perform the transactions.
- Authentication of the customer user ID
- Encryption of the data transmitted over the network
- Encryption of the data stored in the customer mobile device for later use

Customers have concerns regarding the mobile payment services since it does not allow PIN type security. The security is difficult to enforce in mobile device thus raises serious concerns among the IT professionals. Customers as well doubt the security of the mobile device due to this.<sup>18</sup>

### **2.4.2 Interoperability:**

There are no uniform technology standards available for mobile banking since different types of mobile device are used and thus becomes challenging for the financial intermediaries to make mobile banking available to all those devices. Also the device application software used in mobile devices is different where some support the Java software applications while the others support WAP browser or the SMS.

---

<sup>18</sup> Feltault, J., "M-payments: the next payment frontier", 2007, Journal of International Business Law and Regulations

In order to enable the operation of mobile banking services, the financial institution themselves need to provide installed application results in a better security find is easier to use allowing development of more complex services. Also international funds transfer is one important area in this service where funds are transferred in between mobile devices in different countries. Therefore, for these reasons it is important to develop internationally accepted standards for easy operation of mobile banking services. Some Banks like Deutsche Bank have already started pilot projects on the international funds transfers.<sup>19</sup>

### **2.4.3 Risks:**

The mobile banking services face various risks in its payment facilities.

#### **a) Credit and system stability risk**

Credit and systematic stability risk is where the financial intermediaries becomes exposed to the risk of becoming insolvent. This means one party to a financial transaction will not receive the money he or she is owed when it is due. When banking transactions do not settle immediately, and when additional parties are interposed between the customer and the bank, opportunities for credit risk multiply. This leads to direct loss of money held with the financial intermediary. Specially this is much riskier for the smaller phone companies compared to the main banking institutions thus leading to non performance due to insolvency. The risk of failure in one financial institution will result in loss of customer confidence towards the intermediaries.

#### **b) Efficiency risk**

---

<sup>19</sup> "Belgacom pilots mobile payments and remittance transfers", Finextra, 2009.

Efficiency risk is caused when an inefficient risk or overpriced payment system may cost an excessive amount to move money around the economy. Without free information about the available price and the features of the product, the market for the payment services is very unlikely to be competitive. As a result this lack the downward pull of the prices. For an effective competition on the price and quality of the product, a meaningful and comparable product disclosure is required.

### c) **Product mis-match and failure**

Some other main risk that customers face is the risk associated with the payment facilities such as mis-purchasing, inequality of bargaining power and product failure. Lack of disclosure and making decision based on the individual information may result in poor decision-making. Though each payment cards disclosure the various terms and conditions still the customers cannot make sophisticated decisions about which mobile payment products to use.<sup>20</sup>

### d) **Transactional Failure**

Transactional failure is also a risk area that customer face with the payment system. This type of risk occurs where service properly functions as a whole but in particular transactions the payment does not take place or occurrence of an unauthorized payment. Hence possibility of the unauthorized and fraudulent transactions constitutes one of the major risks with any payment system.

To avoid the risk the customers require regular transaction reports, and a cheap and practically accessible form of error resolution. Further the financial regulatory system consisting with common understanding that legal rules should

---

<sup>20</sup> Faber, E. & Bowman, H., "Balancing Customer and Network Value of Mobile Payment services", 2008, Springer Verlag Berlin Heidelberg

minimize the costs of payment system and each system should allocate the loss of unauthorized use to the party in the best position to avoid it. Hence this will affect the development of the m-payments as it is generally accepted that adequate regulation is a key pre-cursor to consumer acceptance of new payment methods, including mobile banking and payments.

**e) E-Money Risks.**

This arises from substantial outsourcing of customer contact to retail agents. It occurs due to acceptance of repayable funds from retail customers by Non-Bank entities that are not subjected to prudential regulation and supervision. Risk is that an unlicensed, unsupervised Non-Bank will collect repayable funds from the public in exchange for e-money and will either steal these funds or will use them recklessly, resulting in insolvency and the inability to honor customers' claims.

Therefore, from a banking regulator's perspective, entrusting retail customer contact to the types of retail agents in both the bank-led and nonbank-led models seem riskier than conventional bank branch. The use of retail agents also potentially raises special concerns regarding consumer protection and compliance with rules for combating money laundering and financing of terrorism.

**f) Operational risk:**

Operational risk refers to potential losses resulting from "inadequate or failed internal processes, people and systems or from external events." For banks and Non-Banks that use retail agents and rely on electronic communications to settle transactions, a variety of potential operational risks arise. Financial loss for banks or Non-Banks (and also potentially for customers) can also occur from data leaks or

data loss from hacker attacks, inadequate physical or electronic security, or poor backup systems.

Banks in Brazil have reported losses because of retail agent fraud and robberies, which reportedly occur with great predictability when word gets around that a particular agent is handling an increased volume of cash.

**g) Legal risk.**

Financial service providers will invest in a new delivery model only if they can predict and manage how relevant laws, regulations, and legal agreements will be applied and enforced, and how these things may change over time.

The Non-Banks involved do research for on the relevant laws and regulations before investing. They also consult with regulatory authorities to have a better understanding on the way existing rules are applied to the new model. But because regulators have had little experience with both models and are still in process in adjusting them, there may be some regulatory uncertainties.

**h) Liquidity risk:**

Since the customers go through Retail agents especially who are infant and remote they face not have sufficient cash to meet customers' requests for withdrawals. In addition the absence of experience may lead to a complex liquidity management which is required for offering financial services. Therefore, for an effective liquidity management, retail agents must balance several variables like processing time for transactions, access to the retail agent's bank account etc.

## Chapter 3

### Regulatory Framework

#### 3.1 *ROLE OF THE REGULATOR*

The financial regulator plays a vital role in the economy of any country by ensuring the financial stability of the economy, and whether the institutions wishing to offer financial services in a responsible manner. In addition the regulator also has a key responsibility for consumer protection. There is a third role for the regulator is promoting a country's social objectives, by attempting to ensure that suitable financial services are available to as many of his fellow citizens as possible, and that the range and complexity of those services increases accordingly with the country's needs. to conclude the financial regulator is concerned about the adequate consumer protection, security of the transactions, stability of banking and payment system, issuance of e-money, distinction between the payments & deposits and the application of AML/CFT/ KYC regulations for account opening/ cash transactions.<sup>21</sup>

However, whilst there is a grain of truth in this particular world view, it has the shortcoming that it can lead to a tendency towards conservatism, with the unintended consequence of raising the barrier to entry for new market entrants - effectively, closing the door behind the existing financial service providers, and protecting them against more efficient competitors.

---

<sup>21</sup> Makin, P., "Regulatory Issues Around Mobile Banking: New initiatives to bank the poor are straining the world's financial regulatory systems", OECD

### **3.2 BANKING REGULATION**

Where provided by traditional banks and deposit-taking institutions, mobile banking and payments are regulated as part of their broader regulated activities. For example, the trials of mobile banking and payments discussed earlier by major conventional banks like Deutsche are regulated as part of their banking services.

Some suggest that mobile payment products will probably become regulated as banks if they become big enough. An audit of M-Pesa was reported due to complaints from banking competitors.<sup>22</sup>

In Australia the mobile banking and payments are regulated under the quasi-prudential regime, which was set up for the purchased payment facilities. Both the Reserve Bank and the Australian Prudential administer this regime where it is for specialist payment service providers whose nature or scale justifies a more intensive regime than the financial services requirements, but something less than full banking regulation.

### **3.3 BROADER FINANCIAL SERVICE REGULATION**

Though the non-bank financial institutions provide the service, mobile banking and payments may be regulated as part of the national financial services regulatory regime. For instance in Australia, all financial service providers must obtain a financial license in order to comply with various conduct and disclosure obligations. The Non-bank provider of mobile banking and payment services also come within that regime and is required to obtain a license from the relevant

---

<sup>22</sup> Chatain, P.L, Zerzan, A., Noor, W...” Protecting Mobile Money Against Financial Crime: Global Policy Challenges and Solutions”, 2011, World Bank

regulator.

In the United Kingdom, the Financial Services Authority has implemented the e-money regime and a number of firms there have already obtained authorization to provide e-money services. There has been some debate about whether mobile phone companies require such an authorization.

In the United States it is unclear at this stage which regime will regulate consumer protection issues for mobile banking payments. It depends on who provides the service and how the dealer processes the transaction after the customer has purchased the goods or services.

Of course, mobile banking and payments may be subject to various other legislative regimes, from telecommunications industry requirements to anti-money laundering rules. Various industry codes of conduct are also likely to apply to these services, depending both on their nature and the nature of the providers.

### **3.4 *KNOW YOUR CUSTOMER (KYC)***

Know Your Customer (KYC) refers to the standard form imposed on financial service providers to implement a Customer Identification Program and perform due diligence checks before doing business with a person or entity. This fulfills the risk mitigation function. One of its key requirements is ensuring that investment advisors know detailed information about their clients' risk tolerance, investment knowledge and financial position and are not listed on any government lists for wanted money launderers, known fraudsters or terrorists.<sup>23</sup>

KYC forms protect both clients and investment advisors. Having their investment advisor know what investments best suit their personal situations

---

<sup>23</sup> World-Check, "KYC Compliance Overview"



protects clients. Knowing what they can and cannot include in their client's portfolio protects investment advisors.<sup>24</sup> The KYC norms can be applied when opening an account, when the banks feel additional information is required and where changes are made to the signatories, mandate holders and beneficial owners etc. KYC norms also can be applicable to non account holders approaching the financial institutions for high value transactions.<sup>25</sup>

### ***3.5 ANTI MONEY LAUNDERING (AML) / COMBATING FINANCE FOR TERRORISM (CFT)***

For financial institutions to develop internal controls to protect themselves from exposure to money laundering and the financing of terrorism it is important to comply with regulations on anti-money laundering (AML) and combating the financing of terrorism (CFT). Based on these developed international standards on AML/CFT individual countries are responsible for introducing local legislative and regulatory regimes.

Whenever account opening and transaction processing is outsourced to retail agents, AML/CFT regulations generally require agents to conduct some aspects of customer due diligence and suspicious transaction reporting. The bank bears the risk that customers are improperly identified and that they use the retail agent to launder money or channel funding to terrorists. Outsourcing account opening and retail transaction processing to what may be unsophisticated retail agents also may make it difficult for the bank to observe and report suspicious transactions.<sup>26</sup>

---

<sup>24</sup> Kondabagil, J., "Risk management in electronic banking: concepts and best practice" 2007, John Wiley & Sons (Asia ) Pte Ltd

<sup>25</sup> Axis Bank available

<sup>26</sup> Isern, J. & Porteous, D., "AML/CFT Regulation: Implications for Financial Service Providers that Serve Low-income People", 2005

Any risk towards the consumers resulting loss triggers consumer protection concerns. The involvement of retail agents unable the customer to understand their rights to press claims when required thus increase the risk. Laws and regulations like the AML/ CFT/ KYC protect these frauds against the customers.

### **3.6 CASE STUDIES**

Mobile banking services has been successfully developing around the world. Most of the developed have implemented the service while the others are at the initiating process. Countries like Philippines and South Africa SMS banking has been very effective. It enabled millions of unbanked people a chance to enter into the financial system the mobile phones. This heading covers the successful developed models in some countries and their main regulatory issues.

#### **3.6.1 Asia**

Mobile banking is most successful in Asia and Africa compared to the other regions. This indicates that Asian countries are potential in the adoption of mobile banking. The regulators are working on the regulatory framework and have been very careful and exact in publishing the guidelines. As a result the penetration rates of mobile banking in Asia are very high.

Being the early adopters of this technology, in 2006, 1.5 million people using mobile phones in Asia estimated that every single person carries a mobile phone.<sup>27</sup>

---

<sup>27</sup> Angelovska-Wilson, A. Feltault, J., "M-Payments: The Next Payment Frontier-Current Developments and Challenges in International Implementation of M-Payments", 2007, Journal of International Business law and Regulations, pg 575

One of the most successful countries in Asia is Philippines and Korea.

### 3.6.1.1 Philippines

A Philippines Smart Money and Money and G-Cash initiative enable the customer to receive money and make transfer payments internationally and transfers among them<sup>28</sup>. The Smart Money is reloadable payment through the debit/ credit card while the G-Cash is cash less method of transforming a mobile phone into a virtual wallet. A typical transaction of G-Cash through a bank costs USD 2.50 while it costs USD 0.5 when automated. Further the SMS based registration costs a minimal charge of USD 0.02 per transaction. However, Smart money limits the daily amounts upto PHP50,000 while G-cash limits PHP 40,000.<sup>29</sup>

Philippines' central bank has practiced a flexible way in the emergence of the mobile banking. The banks that wished to deal the mobile banking service were offered with the approval from the central banks resulting in five commercial banks to enter the field in a partnership with the Smart, the largest MNO.

According to the general banking law 2000, micro finance is allowed as a legal banking activity. Further the law gives authority for the usage of electronic devices like computers to process the data in connection with the banking operations. The Electronic Commerce Act 2000, recognizes the validity of crime by giving a degree of security to private sectors who are concerned about the denial of transactions, legal standing of electronic records and standards for prosecution of e-commerce crimes.<sup>30</sup> Both the laws adopted by Philippines covers the mobile and electronic banking risk management, security procedures, internal controls, internal controls,

---

<sup>28</sup> [www.technology.cgap.org](http://www.technology.cgap.org)

<sup>29</sup> Sultana, "Mobile Banking: Overview of Regulatory framework in emerging markets", p.g 12, Grameenphone Ltd, Dhaka, Bangladesh

<sup>30</sup> CGAP, "Notes on Regulation of Branchless Banking in the Philippines", 2008

anti money laundering regulations, know your customer client requirements and consumers protection. However, Philippines do not have a law or regulations for the national payment system.<sup>31</sup>

### 3.6.1.2 Korea

Korea Telecom Fretel banking combines the mobile phone with a multi pack enabling easy access to mobile multi banking service for all kinds of banking by customers in spite of their location<sup>32</sup>. The SK Telecom launched NEMO the first mobile financial service in South Korea. Using these service customers can transfer money to each other but entering in the payee's mobile number.<sup>33</sup>

Woori Bank and Shinhan Bank are the two major banks offering mobile banking service in Korea. According to Woori Bank, majority of their customers utilize mobile banking services. Their mobile banking service focuses on an integrated system setup connected with the previous banking system to avoid the duplicate investments and allow services through wire and wireless Internet. Their mobile services are available for use with a mobile device equipped with a mobile browser that can access mobile Internet service.<sup>34</sup> Meanwhile, the code division is operating Korea's mobile network multiple access (CDMA) technology. The customers were able to keep a track on the account information, transaction details, and wire transfers between the Woori accounts.<sup>35</sup> These Wire transfers were provided free except the small fee incurred by the transfer bank.

---

<sup>31</sup> Sultana, "Mobile Banking: Overview of Regulatory framework in emerging markets", p.g 12, Grameenphone Ltd, Dhaka

<sup>32</sup> Korea Telecom Freetel, " KTF-Kookmin Bank Service Begins", FTF News, 2004, retrieved from

<sup>33</sup> An, J., "Mobile killer applications in South Korea and recommendations for US policy-makers", 2003, Brooklyn Journal of International Law

<sup>34</sup> Tae-gyu, K., "South Korea Sets Trends in Global Mobile Banking"

<sup>35</sup> Craig,S., "Mobile Bnking vs Mobile Bank", Mobielin, 2008.

The Shinhan Bank, a commercial bank of Korea provides a unique mobile banking service where it uses PDA's and cellular phones and allows 24hrs access to fund transfers. These mobile banking service can be used anywhere at any time and fees are low.

Korean Companies follow the Electronic Fund Transfer Act (EFTA) in offering credit payments and other payment settlements, where the companies have to obtain a license from the government.<sup>36</sup> The security issues are inseparable from the idea of mobile banking for customers, service providers and regulators. Both the EFTA and E-commerce Act are subjected whenever the m-payments trades occur<sup>37</sup>.

Though Korean regulatory environment outlines financial market opportunities, it influences on the risk and obligations between stakeholders where competition, efficiency and quality of the mobile banking service is affected. Therefore, the regulatory authorities and policy makers must ensure that current regulations do not limit the growth of the market<sup>38</sup>.

### **3.6.1.3 Other Asian Countries**

Though Asia is one of the most successful regions in initiating mobile commerce, the pace is much slower than it should since fewer Asian countries meet the prerequisite at present. Therefore, more accurately, the countries are now busy in converting the focus of telecommunications from landline to wireless to meet the requirements.

In Bangladesh through mobile banking the maximum transaction limit is BDT10, 000 but does not allow any cross border money transfers. Any institutions

---

<sup>36</sup> Lee, T.H, "Electronic Financial Transactions in Korea".

<sup>37</sup> E Commerce Act, No.7440 (2005)

<sup>38</sup> Cellular – News, "Vodafone Calls for Regulation to Encourage Mobile Banking".

authorized by the central bank can issue e-money. The central bank grants license to the payment system, payment system operators and payment service to authorize for the operation of the payment system and payment services in bank based models. Similarly these license can be cancelled in case of any violation of the license terms. Further, for the development of payment a settlement systems functioning in Bangladesh, the central bank also published a draft Bangladesh Payment and Settlement System Regulation 2009. Foreign Exchange Regulation Act 1947, Payment and Settlement System Regulation 2008 and Bangladesh EFT Consumer Protection Regulations 2008 are laws applicable in Bangladesh<sup>39</sup> and is also regulated under money laundering prevention act 2002.

In India, major banks like the State Bank of India, ICICI Bank, HDFC and Corporation Bank have introduced mobile commerce services. Along with the banks and associated providers like mCheck India Payment System, Bharti Airtel and Visa, the customers are able to buy tickets, make mobile phone recharge subscriptions and other payments.<sup>40</sup> For instance Visa customers give their mobile number to the merchant at the point of sale where a payment request by the merchant is sent back to the customer. The customer has to accept the request by using a PIN number where the confirmation is sent back to the merchants indicating completion of the transaction.<sup>41</sup> The mobile commerce allows INR2500 for per transaction and INR5000 for per day. The payments system follows the Payment and Settlement System Bill 2008 while AML/CFT is regulated under the Prevention o Money Laundering Act 2002. During 2002, the central bank of India passed mobile banking guidelines stating that only licensed banks are permitted to initiate mobile banking.

---

<sup>39</sup> Sultana, R., "Mobile Banking: Overview of Regulatory framework in merging markets", Grameenphone Ltd, Bangladesh

<sup>40</sup> Dr.Rani, K.M, "Mobile banking: A tool of financial Inclusion for India"

<sup>41</sup> Feltault, J., "M-payments: the next payment frontier", 2007, Journal of International Business Law and Regulations

This means non-banks are not allowed to issue e-money, which eliminates the mobile network operators from the service. Also the service is only provided to debit/credit cardholders and customers with bank accounts. Further other laws applicable in mobile commerce India are Competition Act 2002 and Consumer Protection Act 1986<sup>42</sup>.

Pakistan's EasyPaisa M-banking service by the Telenor Pakistan and Tameer bank has gained popularity within a short period of time. The number of users has increase within this short span resulting in 20,000 bill payments. The customers are allowed to make three transactions per day with a maximum transaction limit of PKR10, 000. For the protection and security of the National Identity card is used the customer authentication. A policy paper on mobile banking was issued by Pakistan central banks, which discussed and recommended a bank-based model. Further Electronic Transaction Ordinance 2001 is followed for the issuance of E-money, where permission is only given to the appropriate authority to provide electronic transactions<sup>43</sup>.

### **3.6.2 Europe**

Many institutions in UK and Europe have performed trials of mobile banking and at least one pilot mobile banking service before its implementation. Lately, Deutsche Bank announced a huge mobile banking project offering cross border mobile banking services. This service will enable the customers a secure payment and money transfer via any mobile network<sup>44</sup>.

---

<sup>42</sup> CGAP, "Notes on Regulation of Branchless banking in India", 2008

<sup>43</sup> CGAP, "Notes on regulation of Branchless Banking & the draft policy paper on regulatory framework for mobile banking in Pakistan", 2007

<sup>44</sup> "Deutsche Bank embarks on massive m-payments project, hires ABN Amro's van Wezel", 2009, Finextra available at <http://www.finextra.com/fullstory.asp?id=19758>

Belgian telecommunications company Belgacom has recently announced pilot mobile payments and remittance services. This service allows the customers to make transfer funds, peer- to peer payments, view transactions. It relies on variety of technologies including SMS, a specially downloaded Java application and the mobile Internet. They also announced mobile phone based international money transfer service.<sup>45</sup>

Your Rail is a payment system in UK where customers can buy a train ticket by SMS and in return receive the ticket by MMS. This ticket is displayed in the phone and the barcode is scanned at the ticket barrier.

### **3.6.3 Africa**

Mobile banking and payments have been especially important throughout Africa and have been introduced in many countries like Sudan, Ghana, Kenya and South Africa, and have built a fine base. Over the years, mobile phone ownership rates have grown in Africa since more people are supporting to the system by implementing mobile infrastructures rather than the using landline. A survey on Tanzania represented a 97% per cent of individuals having access to a mobile phone.<sup>46</sup>

#### **3.6.3.1 South Africa**

South Africa has two mobile banking services WIZZIT and MTN Mobile Money. Both the services involve non-banks and banks and works in partnership with them. The customers use the mobile phone as a mean for their payments since

---

<sup>45</sup> Deutsche Bank embarks on massive m-payments project, hires ABN Amro's van Wezel", 2009,.

<sup>46</sup> Feltault, J., "M-payments: the next payment frontier", 2007



the together the bank accounts application is fully integrated with mobile phone.<sup>47</sup> Wizzit uses a pay-as-you-go pricing model where the transactions are charged based on the type with charges from USD 0.13 to USD 0.66.<sup>48</sup> A maximum of ZAR1000 is allowed for per day transactions and uses the South African Identity number as a security measure towards the customer. Though Wizzit do not require a minimum balance and fixed monthly fee, it charges its customers to sign up. Compared to traditional banking customers, Wizzit users expenditure seems lesser.

To facilitate the development of bank-based m-banking, the South African government has been working actively to set the regulations. The payment system is regulated by the National payment systems Act and follows the Financial Intelligence Centre Act (FICA) and its regulations govern anti money laundering. The E- money issuance is also allowed only to the banks.<sup>49</sup>

### **3.6.3.2 Kenya**

M-Pesa is one of the most successful mobile banking services today. Vodafone and Safaricom's mobile money transfer services M-Pesa is a non-bank based model. The customers using M-Pesa is more than bank accounts in Kenya. The service is provided in both prepaid and credit format where the customer makes payments and receives a bill at the end of the month. The customer does not require a bank account to access the service. Software is installed on their mobile handsets in order to get the service.<sup>50</sup>

The users of M-Pesa do not have to pay any registration or any monthly fees. Customers can deposit funds into their M-PESA account by giving cash to an

---

<sup>47</sup> Sultana, R., "Mobile Banking: Overview of Regulatory framework in emerging markets", Gameenphone Ltd

<sup>48</sup> [www.technology.cgap.org](http://www.technology.cgap.org)

<sup>49</sup> CGAP, "Notes on Regulation of Branchless banking in South Africa", 2008

<sup>50</sup> "M-PESA", 2009

M-PESA agent who accepts the funds, records the transaction and credits the customer account. They also do not need to maintain any minimum account balance.<sup>51</sup> Consumers can withdraw up to KES 35,000 per day in order to mitigate against the settlement risk.<sup>52</sup>

To make a payment the customer access the M-PESA application on their phone, specifies the phone number of the payee and the amount to be sent, and uses the PIN to confirm the transaction. SMS is received to both the payer and payee as a transaction confirmation.<sup>53</sup> Customers also can withdraw funds through an M-PESA agent or participating ATMs or also can make bill payments and purchase mobile phone airtime.<sup>54</sup>

The strong regulation by the central bank of Kenya is one of the key factors to their mobile banking success.<sup>55</sup> They do not have any laws, regulations or policies dealing with e-money and no laws expressly governing the payment system. The central bank authorized Safaricom to undertake the money transfer service on the basis of safety, reliability and efficiency of the service. The Financial Institution Supervision's main concern regarding M-Pesa was whether Safaricom was following the rules for banking without failure. Further, precautionary measure also was put in place to ensure that their service was provided according to the regulatory framework.<sup>56</sup>

---

<sup>51</sup> [www.centralbank.go.ke](http://www.centralbank.go.ke)

<sup>52</sup> CGAP, "Notes on Regulation of Branchless banking in Kenya", 2007

<sup>53</sup> "M-PESA", 2009

<sup>55</sup> "Experience Details: Notes on regulation of branchless banking in Kenya Nov 2007", Rural Finance Network

<sup>56</sup> CGAP, "Notes on Regulation of Branchless banking in Kenya", 2007

### **3.7 REGULATORY DEVELOPMENT OF A SUCCESSFUL MODEL**

The success of branchless banking schemes particularly M-PESA has led to some recent developments in regulation. Some of these are based around the view that regulators only allow banks to offer such services, which suggests that they do not understand that the same regulatory environment can be applied to non-bank institutions. This lack of understanding among the regulators on non-bank institutions can be due to a lack of visibility with the mobile operators capabilities.

In Kenya, an audit of M-PESA was done to verify its security against the used money launderers and pyramid schemes. The Kenyans were not so satisfied with the move. Due to these new audits was carried out to counter measure the systems security and were able to able to certify that M-PESA offers bank-grade security and controls to its customers. By the end of the process M-PESA was given satisfactory result and allowed to continue with its operations.<sup>57</sup>

Europe's approach in creating a separate regulatory category of Payment Institutions and separating the regulation of payment services from the regulation of credit institutions might be a very useful model. Kenya's banks are allowed to issue M-PESA through agents rather than limiting their services on their own. This approach has gained considerable benefits for both banks and customers in a number of countries like Brazil. If the Kenyan banks get hold to this opportunity they will benefit from M-PESA by viewing it as an opportunity cost rather than considering it as a competitor. If the banks chose to offer access to loan, savings accounts etc by M-PESA customers lots of M-PESA agents would be handling in and out cash

---

<sup>57</sup> Jack, W. & Suri, T., "The economics of M-Pesa" 2010

movements from their accounts which possibly can save a significant amount of money.<sup>58</sup>

The development of the Indian Branchless banking sector has been delayed. This is due to the regulatory changes for the sector by the central bank, which includes schemes where the service should be operated by a bank. This clearly blocks the new entrants from entering into the market thus schemes that were close to launch were put on hold. Comparing the Indian situation with Mexico, the central banks has allowed the agents including the dealers and banks to open mobile banking accounts for their customers because agent networks are (rightly) seen as key financial inclusion given the scarcity of branches in rural and semi-urban areas.

Forums for financial regulators and others representing emerging markets allows an opportunity for policy makers to review the issues around areas such as branch-less banking.

---

<sup>58</sup> Jack, W. & Suri, T., "The economics of M-Pesa" 2010

## Chapter 4

### Mobile Banking in Maldives

#### 4.1 COUNTRIES AND SECTOR BACKGROUND

Maldives comprises of 1,090 islands scattered across the Indian Ocean with a small average population of 600 people per island distributed among 250 islands. The capital island, Male' comprises a population close to 100,000 and act as the main centre for economic activity and public administration.

Since the biggest employer in the country is the government, the majority of the people are employed in public service. The main reason for this is that the private sector of the country is developing at a low pace and therefore limiting the labour capacity. The government has been in collaboration with the private sector represented by Ministry of Chamber and Commerce and Industry to develop Small and Medium Enterprise (SME) in the country hence increase the involvement of private sector in the development of the country.<sup>59</sup>

Over ten years, Maldives had an admirable economic growth with an average GDP growth rate of 8% until 2004 when the tsunami destroyed a large part of productive infrastructure. Since Maldivian economy is largely service oriented, around 80% of GDP is contributed by tertiary sector. Tourism and fisheries are the two major sectors dominated in the economy.

The financial sector is very narrow and is subject by the banks. There are five banks in the country dominated by the state owned bank; Bank of Maldives with

---

<sup>59</sup> "Maldives Mobile Banking Project", Ministry of Finance and Treasury

17 branches around the country. Other banks branches comprise of State Bank of India, Bank of Ceylon, Habib Bank and HSBC with its single branches located only in the capital city. The banks follows a traditional approach has been highly in contact with the tourism sector thus the competition among them is quite high. All of them offer a collateral lending system for both short and medium term lending but the fixed rate funding is rare.

The nonbank financial institutions contains a few companies; one mortgage company, one finance lease company; Maldives Finance Leasing Company Pvt. Limited (MFLC) which is under the supervision of Maldives Monetary Authority and 2 insurance companies. All banks and the non-bank financial institutions operate under the supervision of the Maldives Monetary Authority (MMA).A few branches of Bank of Maldives are opened up in some islands of the country.<sup>60</sup>

The lack of basic financial services perpetuates poverty and vulnerability. The banked population in Male' is about 65 percent and about 30 percent in the islands. Most people in the Maldives remain without a safe place to save money, and those working away from their home islands find it expensive and time-consuming to send money to family. Insurance products are unavailable to most in the atolls, and the nearly universal use of cash means that people's basic earnings are vulnerable to loss, theft and natural disasters such as the recent tsunami.<sup>61</sup>

In Maldives, government owns over half of the largest telecom company on the islands, Dhiraagu, which is the dominant of the two mobile networks and the sole landline network, the mobile banking is provided through this network, therefore receive revenue from any banking transactions made using its network queries whether the scheme is little more than a money-making fix.

---

<sup>60</sup> "Maldives mobile banking project", Maldives Monetary Authority

<sup>61</sup> "Maldives Mobile Banking Project", Ministry of Finance and Treasury

Like other developing countries, the Maldives is striving to catch up with modern technology and to adapt to the rapid changes.

#### **4.2 MOBILE BANKING DEVELOPMENT IN MALDIVES**

With the help of US\$7.7 million from the World Bank, Maldivian Government has designed to improve access to financial services by initiating users to access any bank account using their mobile phone.

The Mobile Phone Banking uses a single currency payment system, to allow the islands' residents to pay money in and out swiftly without the need to travel to the nearest branch. This payment system offers a set of mobile telephone-based accounts. It enables subscribers to transfer funds to and from bank accounts and from telephone-based accounts.<sup>62</sup>

According to Alastair McKechnie, World Bank Country Director for the Maldives, the high literate rate and mobile network coverage of the country, Maldives is capable enough to use the technology to overcome the barriers and deliver financial services at lower cost.<sup>63</sup>

Collaboration between the Maldives Monetary Authority (MMA) and the microfinance industry body (Consultative Group to Assist the Poor) was initiated to develop a concept and proposal that provided the basis for the project. To establish a regulatory framework the CGAP funded for the policy advice.

---

<sup>62</sup> "Maldives introduces Mobile Banking", 2008, OneWorld South Asia available at: <http://southasia.oneworld.net/ictsfordevelopment/maldives-introduces-mobile-banking>

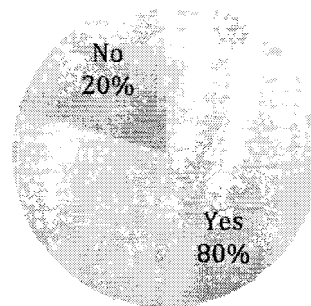
<sup>63</sup> Maldives introduces Mobile Banking", 2008, OneWorld South Asia available at: <http://southasia.oneworld.net/ictsfordevelopment/maldives-introduces-mobile-banking>

This initiation of mobile banking in Maldives show that remote locations need no longer be barriers to accessing convenient, affordable financial services. The improvement in access to finance to enhances the development of private sector<sup>64</sup>.

#### 4.2.1 Raised Awareness

A key consideration highlighted in the primary research is the level of awareness that customers have of mobile banking. The consumer study showed that in Maldives over half of respondents were aware of the mobile service offered as shown in Figure 1

Figure 1: People's awareness on Mobile Banking



It appears that the financial authorities who currently offer mobile services to customers are marketing the service well to raise awareness.

It will be interesting to observe how this trend changes over time, especially with concerns. The recent survey voiced from several corners of the respondent shown in Figure2 that they are not willing to adopt the mobile banking mainly regarding transaction security, which becomes very

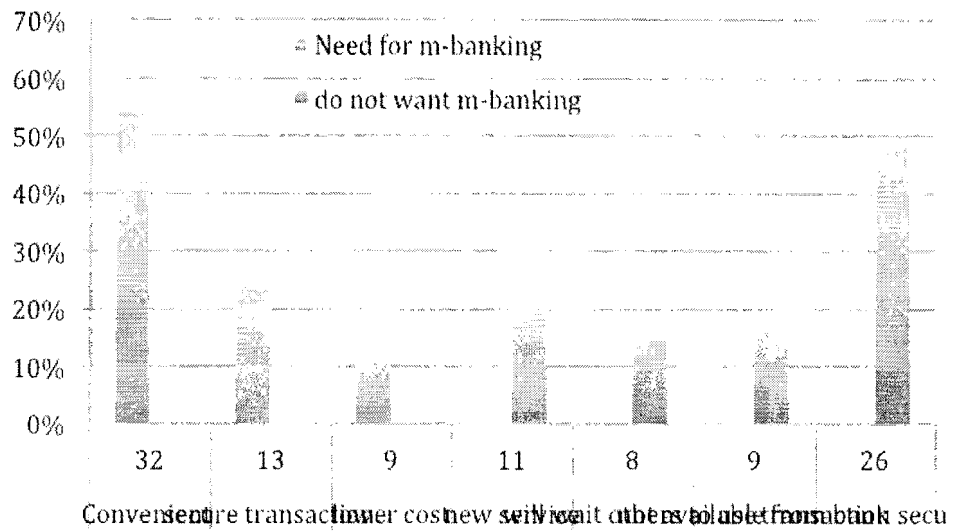
---

<sup>64</sup> "World Bank Funds Mobile Banking Development in Maldives", 2008, Cellular News available at: <http://www.cellular-news.com/story/30623.php>



challenging for the mobile banking developments.

Figure 2: Adoption of Mobile banking by customers

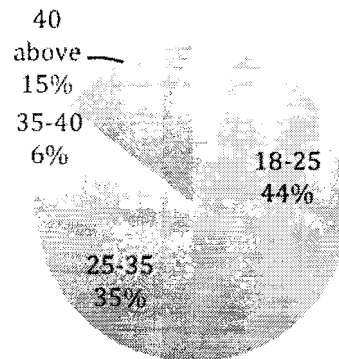


At the same time most of the customers are willing to adopt mobile banking for the convenience of the service.

#### 4.2.2 Considering the consumer

As customer-driven organizations, it is important to ascertain what banking customers think of mobile services in order to set the context for further discussion. Figure 3 shows, a surprising number of mobile users acknowledge the appeal of dealing with financial matters. Almost all the respondents are mobile users among which the majority respondents are between 18- 25 of age this means usage of mobile phones are more among the young generation compared to the old.

Figure 3: Customers using Mobile Phones



Further it is also important to check number of account holders to study whether banked or non-banked mobile banking service would be more suitable and effective. More than half of the respondents are bank account holders as shown in Figure 4. This means that more customers are there for a bank based service at present but a non-bank based service also can be initiated to make the service available to the customers in rural areas (islanders).

Figure 4: Customer currently obtaining bank A/C

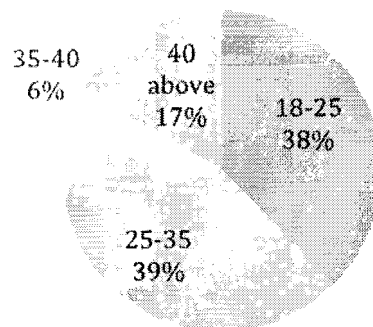
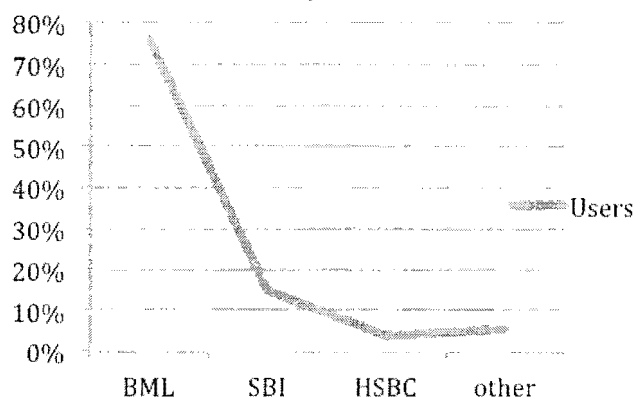


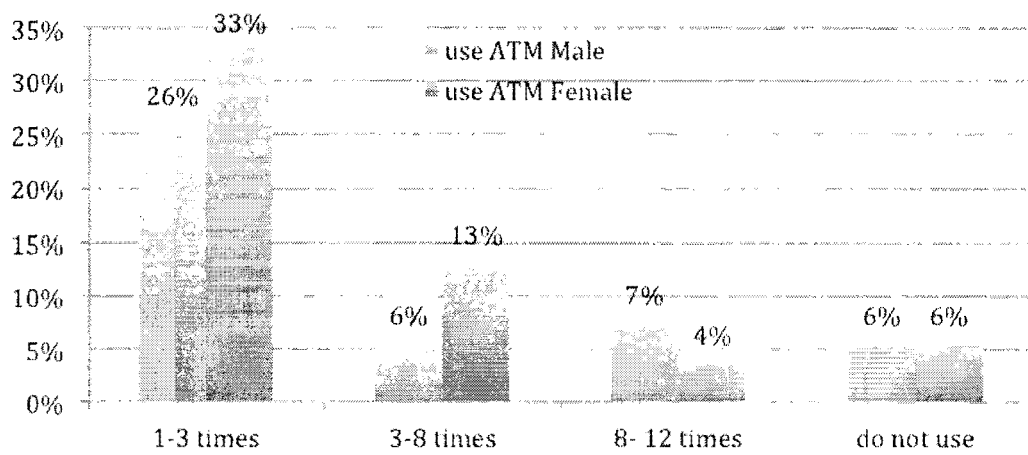
Figure 5: Customers obtaining bank a/c in various banks



Among the respondents with the bank accounts most carries an account with BML (Bank of Maldives) as shown in Figure 5, who is the dominating bank in the market and also the provider of mobile banking in collaboration with Dhiraagu the Telecommunication authority. It would be a greater chance for the future development of mobile banking hence Bank of Maldives carries most of the customers and can provide them with the mobile banking service easily.

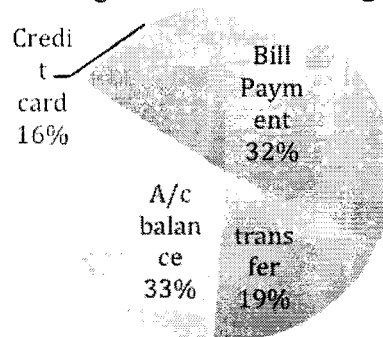
It is also important to check how frequently customers use the ATM to withdraw cash as shown in Figure 6. Hence this could be a positive signal to initiate the mobile banking hence the users are frequent can withdraw cash more easily through mobile banking.

Figure 6: Use of ATM by customers



As Figure 7 shows, the type of services that consumers would be interested in when adopting mobile banking services, majority respondents (33%) expressed a preference for bill payments and standard transactional information, such as receiving balance enquiries via the mobile. With the evident enthusiasm for personal financial information via the mobile expressed by the consumer survey, there would appear to be a clear opportunity for retail banks to capitalize on this position.

Figure 7: Usage of Mobile Banking



Hence if the market is lead by a single company, lack of competition can affect the quality of the service. With more than one competitor in the market can lead to high quality service along with better prices and offers. More than half of the customers responded mobile operators as the operator to provide mobile banking other than the banks.

#### **4.3 HOW DOES MOBILE BANKING WORK IN MALDIVES**

Maldives Mobile Banking is a free service provided by Bank of Maldives, which allows its customers to obtain certain account services and banking functions via the mobile phone by sending an SMS. Both the Telecommunication operators Dhiraagu and Wataniya allow registration to mobile customers for this service.

Maldives Mobile Banking allows customers to check their Account and Card balance, view mini statement, transfer funds and block card in addition to many other functions. Customers can also receive salary deposit notification, loan payment and card payment reminders through SMS. Users can set up their own alerts through Maldives Internet Banking to receive balance updates, account and card related transaction alerts to their mobile phones and/or email addresses. At present purchases and payments are not supported through Maldives Mobile Banking.

Registering for the service at their branch can make registration for Maldives Mobile Banking. Registration can be even made through Maldives Internet Banking via ATM, which is yet to come.<sup>65</sup> Maldives follows the Maldives Financial Consumer Protection Act 2011 in delivering mobile banking.

---

<sup>65</sup> Article written By Bank of Maldives,2010 available at <http://www.bankofmaldives.com.mv/Information/MediaRelease/Pages/MediaRelease6.aspx>



## **Chapter 5: Issues and Concerns**

### **5.1 REGULATORS' ISSUES WITH MOBILE BANKING**

In conversation with financial regulators some common concerns have arisen about branch-less banking. Schemes such as M-PESA, with no direct bank involvement should not be allowed and instead a bank should always lead schemes. Also lack of familiarity with non-bank institutions has also been raised. Usually, regulators feel comfortable with their existing relationships with the banks and other financial institutions they regulate. The reports by these institutions are familiar and easy for the regulators to go through and influence those institutions' operations.

Finally, some regulators were concerned about the effect that the failure of a branch-less banking scheme would have on customers and to the economy. This is a genuine concern since many established branch-less banking schemes raise this issue based on some of their competitors' new offerings.

### **5.2 NETWORK COMPLICATIONS**

Financial service companies that provide their customers with mobile finance services are accustomed to regulatory disclosures and consumer protection requirements that apply to electronic delivery of services. In mobile financing they must be aware of three communication networks that play a part in starting and dismissing mobile finance transactions; the traditional wire line network, Internet and wireless cell phone networks. Unlike the early days, there are far more carriers to deal with today to make Mobile Banking a reality. Throughout each of these three

layers of communications, there are a wide selection of legacy regulations and technologies to contend with before a Mobile Banking transaction can be initiated and completed. The mobile finance requires an understanding of how these three networks can work inline in a safe, secure and cost effective way.

### **5.3 ABSENCE OF UNIFORM STANDARDS**

Early days Electronic funds transfer was evolved using open standards designed whereby todays community is different and served by multiple wireline, wireless and cable carriers. No uniform guidelines are followed through out the industry to consult for mobile banking service offerings to their customers. Today a wireless carrier and a third party vendor leads the proprietary arrangements. Financial Institution customers subscribe at least four different nationwide wireless operators. Banks who wants to provide mobile banking to their customers must deal with four or more wireless operators to initiate even the simplest mobile transaction.

### **5.4 OTHER COMMON CONCERNS**

Sometimes both the wireless operators and financial institutions face common concerns where both the parties find solution for these issues bilaterally. Inorder to adopt a safe and functional mobile banking services, one must concentrate on its network security, capacity and control, customer privacy and informed consent, liability, fraud prevention/authentication, interoperability/standardization, data access and use, parental controls and financial risks/rewards .



### **5.5 WIRELESS CARRIER'S CONCERNS**

Though the financial institutions and the wireless operators are the two players in the mobile banking service, they operate in entirely different industries in ways thus creating fundamental concerns towards Mobile Bank services. One area of concern is the customer ownership. The customers establish service relationship with a particular wireless operator in mobile banking transaction unlike electronic fund transfers where the customer does not know about the transaction handling. Therefore, to retain their customers the wireless operators has to exploit and protect the relationship with the customers.

Wireless operators use different legal risks and obligations in respect with mobile transactions. The common concerns mentioned earlier are the only. Other the common concerns mentioned earlier, the wireless operators do not have limited liability for the data that traverses their networks or any legal responsibility towards consumer incase if the transmission is incomplete. The wireless operators inly have to reimburse that for any service charges incurred by the customer.

This implies differently to the financial institutions since the financial institution's legal obligation once the customer's order is received, is to complete each financial transaction initiated by the customer. At the same time, wireless operators have to follow a wide array of laws and regulations governing the way in which they handle customer information. Thus these legal obligations become a concern for the wireless operators and carries work with financial institutions in the mobile banking.

For instance, under the law the information of the customers used to authenticate the transactions to Financial Institutions are deemed under "customer proprietary network information" laws. This means the wireless carriers without the

customer's consent cannot pass this information to any other third parties. According to the federal Communications Act, they only have the right to allow the services to the customers only on reasonable terms. However, some wireless operators refuse to allow bank initiated products whether the federal regulators can act upon the matter to resolve the problem.

## **5.6 FINANCIAL INSTITUTION CONCERNS**

Financial institutions view mobile transactions not only as an application only. They inspect every transaction run by them very closely to initiate and complete safe and secure transfers of money. For them mobile banking and mobile finance raise a number of legal, regulatory and operational issues that have yet to be resolved on a comprehensive basis.

### **5.6.1 Security**

Under the regulation there is a nominal liability when a consumer identifies a transaction as an unauthorized electronic fund transfer. Unlike the debit and the credit card, in the wireless transactions the risk of stealing transaction information is higher which triggers acts like the Fair and Accurate Credit Transactions Act. Without the use of highly secure encryption technology to prevent third party data intrusion and losses, the tools of Mobile Finance open the door to enormous potential for monetary as well as reputational risk. It is also examined that the security of a Financial Institution's Mobile Banking products and services are proportionate with the Financial Institution size as well as the complexity of the products and services they offered.

The financial institutions duty does not end by offering download of security system as a part of the Mobile Finance package. It is an ongoing process of monitoring, evaluating and adjusting to new threats meaning that they must be capable to do upgrades, patches and changes to its Mobile Banking product which is needed by the consumer to continue the product.

### **5.6.2 Customer Authentication**

One of the most difficult problems facing banks is the issue of customer authentication. While in many ways a mobile handset is inherently more secure than a desktop computer, the mobility of the device and the nature of wireless communications create additional authentication and security issues for financial institutions and their customers. The Financial Institution has to consider its obligations under the USA PATRIOT Act to correctly identify the party seeking Mobile Banking services to access an account. The KYC norms must be reviewed to inspect how and whether mobile banking service provided by the financial institution can accurately determine the identity of an existing customer. It is also required to check whether services are established and a relationship formed at the opening of the account, whether traditional account number, PIN and test questions are enough for authentication, whether Financial Institution treat a request to change phone numbers as a "Red Flag".

Money laundering is also an important concern today in Mobile Banking. Therefore, the financial institutions must participate Mobile Banking into its BSA, AML and OFAC compliance programs. Due to the prospects for financial mischief on a broad scale, security issues need to be resolved across the board before providing the customer with a safe service. However this cost incurred threatens the

smaller financial institutions since some regulatory requirements regarding the customer security can make mobile banking a costly preference for some institutions.<sup>66</sup> Also the possibility that a device can be used in a foreign country to initiate a financial transaction must be reviewed for a better customer authentication. Therefore, security and regulatory compliance issues have to be aware of international laws and international banking regulations for a better customer authentication.

### **5.6.3 Clearing and Settlement**

There are various laws and regulations to direct the clearing and settlement of transactions between banks. Mobile banking services must have the ability to track each transaction throughout the payment stream, recreate the path of commerce, and allocate responsibility for errors including unauthorized transfers. Under the regulations required by consumer transactions, these must be documented on a periodic statement. Businesses demand mobile banking services to be incorporated with positive pay and other advanced fraud detection and prevention tools commonly used in the clearing and settlement process. Mobile banking must be in compliance with the law and regulations in order to perform its services.

### **5.6.4 Liability/Dispute Resolution**

One of the distinct concerns among the financial institutions and the service providers regarding mobile finance is risk allocation and liability. In all ways the financial institution must be responsible for ensuring that banking transactions are

---

<sup>66</sup> Kim, J., "Ubiquitous money and walking banks: environmental, technology and competition in mobile banking", 2008, Westlaw, Richmond Journal of Global Law and Business

properly initiated and closed. Other types of financial transactions, such as those involving ATMs and credit cards also have detailed laws and regulations regarding the liabilities of financial institutions.

Looking at the mobile carriers, they are deemed to be limited liability entities and does not have they have to do anything but to ensure that data communication is originated and terminated and to refund the calling party for the cost of that transmission if the communication fails. As the use of mobile banking increases so does the problems of mobile financing which result in growth of risk allocation. Financial institutions will undoubtedly be interested in seeing that these risks are shared in ways not currently required by law.

### **5.6.5 Customer Ownership and Funds Management**

Mobile Banking and finance create interesting challenges to the models where the organizations take deposit from the customers and held them on their behalf. This is because the customers are doing business with the financial institutions and the mobile operators at the same time. However, the same institution that regulates the banks does not regulate mobile carriers. Therefore the question remains as to who will be responsible for the financial regulators for all aspects of transactions that employ a mobile wallet. Regulatory responsibility will also be of interest in those instances where clearing a financial transaction is delayed for some period of time due to wireless technology or network problems.

### **5.7 MAJOR TECHNICAL ISSUES IN MOBILE BANKING**

Only few technical issues arise from the branchless banking solutions that impinge on their regulation. The issues are based on the security, concern the mobile handset's SIM, end-to-end encryption and essential for bank-grade security of transactions.

There is only one way of doing end-to-end encryption for branchless banking using the SIM. As the SIM is under the mobile operators control, the security scheme can only be offered and controlled effectively by them. This means a mobile operator led scheme can offer full security. This problem can be resolved by either relaxing the SIM controls / Relaxation of security.

In relaxation of security, there is an argument that the SIM will, at some point in the relatively near future, achieve the status of a public utility. This would imply that complete control of the SIM should be taken away from the mobile operator, and some portion of its capabilities made available, through the mobile operator, to third parties.

In relaxation of security, security is not possible without access to the SIM. However, not only the mobile operators should be able to deploy branchless banking solutions. Therefore, the lower security of SIMless schemes should be accepted and subjected to suitable controls like having maximum number of customers with a smaller maximum transaction size and enhanced server-based controls. This demonstrates the intricate connections between issues of public policy and technical minutiae, and that neither should be fixed without consideration for the other.

## **5.8 MAJOR REGULATORY ISSUES**

Branchless banking and its regulations has various principal regulatory issues around it.

Branchless banking may face the risk of high profile failure. This would unavoidably affect the reputation of all branchless banking schemes thus can upset the sector as a whole.

The third issue is the suitability of KYC regulation with the mobile banking regulations followed. KYC requirements undoubtedly help to hold back branchless banking sector. Since KYC norm are in the necessary format the consideration should be given to whether or not the current application used is appropriate. For instance the person sending \$20 have to undergo the same KYC checks as the person who sends \$10,000. Possibly for poor customer the KYC norms application could be limited and for the transaction, which weighs more can apply the KYC fully. However, this relaxation in the regulation can increase the risk of terrorist attacks.

The regulators in general, and the AFI in particular, need to give due consideration to these issues. To act upon the issue the regulators need to get convinced that branchless banking schemes are trustworthy. The adopted schemes must have appropriate reporting channels in place and the regulator must have access to the necessary controls, scheme should be auditable and KYC/AML controls must be in place. The scheme also is properly secure, and presents little risk to customers.

If the mentioned points are fulfilled the regulators will be able to trust the branchless banking scheme. With regard to this final point, there is a clear market opportunity here for one or more large insurance organizations, though we understand the concerns they have about entering this nascent market. One might

expect a wide variety of mobile financial service providers springing up to deliver finance given regulatory stability, foresight and imagination.



## **Chapter 6: Conclusion and Recommendations**

### **6.1 CONCLUSION**

Mobile banking and payments have great potential to open a broader range of service to a wider range of customers. It is mainly undertaken by the non-banked population, its do not necessarily require for a conventional bank account. Further it allows the customer to enter into the market to make the non cash transactions thus broadening their choices and interaction

The poor find the mobile finance service very beneficial since lower income customers need more regular access to check the account balance. Also it facilitates cheaper and more convenient international fund transfers for those customers who wish to send money back to their families.

The regulation of banking and payment services is at the infant stage. The services practicable depend on the regulatory model adopted. In the implementation of mobile banking each country must adopt a regulation for the payment system, which is in the best interest of its customers.

However, they are many issues that need to be considered before implementing mobile banking and payments. From the wireless operators angle, they have started the best practices in accordance with the Federal Commissions input. Therefore, no violent action is intended to take by the Federal Commission with respect to mobile banking unless some problem occurs with wireless transactions.

From the financial institutions point of view mobile banking and mobile finance services have to work more to get inline with other electronic fund transfers.

Therefore for a better practice of mobile banking must work towards creating sale at the same time provide with reasonable mobile banking service.

Other than the two players involved in mobile banking services, the regulatory entities are inspecting the mobile banking service and transactions to check whether banking regulations are followed and what other changes are to be made for the expansion of their current regulatory guidance on mobile banking.

Therefore to initiate a successful mobile banking and payment system, it necessary to the issues that are stopping the development of the services and minimize the loss of adoption by allowing the best regulatory practices which suits the customers. The regulations also need to be very upto date. One of the reasons why Kenya has the successful model is that they have regulations that best suits the service and also allows the service to non-bankers, which is the majority among the customers.

## **6.2 RECOMMENDATION**

One of the major issues highlighted is the problem of a uniform standard. There does not exist a standard that can be followed by all the financial institutions for providing the mobile finance. This creates controversies especially when a transaction in made across the borders since the standards followed by the countries is different. Therefore for successful enhanced services of mobile finance the mobile finance service providers must adopt a uniform standard where all the dealers follows the same standard thus avoid complications. The changes necessary to enable cross border retail payments is recommended.

Further substantial work is needed to modernize the regime to cope with the mobile banking service. Some key changes like changes required to customer

identification, money laundering and customer service outsourcing regulations, the authorization which mobile operators would need to be authorized as financial service providers or deposit takers and appropriate consumer protection measures are required for a well established mobile payments.

In Maldives mobile banking has been initiated few months ago. The service was introduced after studying the market. Yet there are no issues highlighted in the service since the service is in its infant stage. However, it is recommendable to introduce the non-bank mobile payment service since currently only bank led mobile payments are used. This will enable the people in isolated islands to make transactions easily. Further, cross border trade is very much in use in Maldives therefore enabling the cross border transactions can benefit the traders.

## **Bibliography**

### **BOOKS**

1. Chaitan, P.L, McDowell, J. & Mousset, C., “ Preventing money laundering and terrorist financing”, 2009, World Bank
2. Chatain, P.L, Zerzan, A., Noor, W...” Protecting Mobile Money Against Financial Crime: Global Policy Challenges and Solutions”, 2011, World Bank
3. Curwen,P. & Whalley, J., “Mobile communication in a high speed world”, 2009, Gower Publishing Ltd
4. Faber, E. & Bowman, H., “Balancing Customer and Network Value of Mobile Payment services”, 2008, Springer Verlag Berlin Heidelberg
5. Hopton, D., “Money Laundering: A Concise guide for all business”
6. Kondabagil, J., “Risk management in electronic banking: concepts and best practice” 2007, John Wiley & Sons (Asia ) Pte Ltd
7. Makin, P.,“ICTs for development: improving policy coherence”, Organisation for Economic Co-operation and Development **Books**
8. Muralidharan, D., “Modern Banking: Theory and practice”, 2009, PHI Learning Pvt Ltd
9. Nakkeeran, R. and Palanivelu, T.G, “Wireless and mobile communication”, 2009, PHI learning PVT Ltd Branki, C., “Technoques and application for mobile commerce”, 2008, the authors and IOS Press
10. Nenova, T., Neong, T.C & Ahmad, A., “ Bringing Finance to Pakistan’s poor”, 2009, World Bank
11. Outlook Money, 2008

12. Park, S., "Strategies and policies in digital convergance", 2007, Idea Group
  13. Pride, W.M, Hughes, R.B & Kapoor, J.R., "Busines"
  14. Rajaram, "Essentials of E-commerce technology", 2010, PHI Learning Pvt Ltd
  15. Ratha, D. & Mohapatra, S., " Remittance Markets in Africa", 2011, World Bank
  16. Rhyne, E., "Microfinance for Bankers and Investors: Understanding the Opportunities and Challengers of the market at the bottom of the pyramid", 2009, McGrawHill
  17. Stair, R.M, Reynolds, G. & Reynolds, G.W., "Principles of information system", 2009, Cengage Learning
  18. " The mobile internet", Information Gatekeepers Inc
  19. " The repot Indonesia 2010", Oxford Business Group
  20. Ulhenkar, B. &Gale, T., " Handbook of research in mobile business
  21. Word Bank, " Banking the poor: measuring banking access in 54 economies", 2009, international bank for reconstruction and development
- 
1. Ahmed,I, ".mv Maldives", IDRC\*CRDI Angelovska-Wilson, A. Feltault, J., "M-Payments: The Next Payment Frontier-Current Developments and Challenges in International Ibrahim.M &
  2. An, J., "Mobile killer applications in South Korea and recommendations for US policy-makers", 2003, Brooklyn Journal of International Law
  3. Axis Bank
  4. "Belgacom pilots mobile payments and remittance transfers", Finextra, 2009

5. Cellular – News, “Vodafone Calls for Regulation to Encourage Mobile Banking”, 2007
6. CGAP, “ Notes on Regulation of Branchless Banking in the Philippines”, 2008
7. CGAP, “Notes on Regulation of Branchless banking in India”, 2008
8. CGAP, “Notes on Regulation of Branchless banking in South Africa”, 2008
9. CGAP, “Notes on regulation of Branchless Banking & the draft policy paper on regulatory framework for mobile banking in Pakistan”, 2007
10. CGAP, “Notes on Regulation of Branchless banking in Kenya”, 2007
11. Craig,S., “Mobile Bnking vs Mobile Bank”, Mobielin, 2008
12. “Deutsche Bank embarks on massive m-payments project, hires ABN Amro’s van Wezel”, 2009, Finextra
13. Dr.Rani, K.M, “Mobile banking: A tool of financial Inclusion for India”
14. E Commerce Act, No.7440 (2005)
15. “ Edgar, Dunn & Company, “Realizing the full potential of mobile commerce”, 2009, Sybase
16. “ Experience Details: Notes on regulation of branchless banking in Kenya Nov 2007”, Rural Finance Network
17. “FTC Facts for consumers”, 2006
18. Feltault, J., “M-payments: the next payment frontier”, 2007, Journal of International Business Law and Regulations
19. Implementation of M-Payments”, 2007, Journal of International Business law and Regulations, pg 575
20. Isern, J. & Porteous, D., “AML/CFT Regulation: Implications for Financial Service Providers that Serve Low-income People”, 2005, World Bank

21. Krishnaswamy.K, 2009, “You hate ATM fees? Imagine what you’d pay if going to the bank meant getting on a boat”
22. Korea Telecom Freetel, “ KTF-Kookmin Bank Service Begins”, FTF News
23. Kim, J., “The Impact Of Derivative Financial Market Expansion On The Central Bank's Monetary Policy”, 2009
24. KTF Home Page, 2008
25. “Maldives: World Bank Group Supports Mobile Phone Banking” , 2008, The World Bank, Press Release No:2008/277/SAR
26. Makin, P., “Regulatory Issues Around Mobile Banking: New initiatives to bank the poor are straining the world’s financial regulatory systems”, OECD
27. Mashhour, A. & Zaatreh, Z., “ A Framework for Evaluating the Effectiveness of Information Systems at Jordan Banks: An Empirical Study”, 2008, Journal for Internet Banking & Com
28. "M-PESA", 2009 Mobile Banking Boosts Maldives”, 2008, BBC News “Mobile banking, mobile money and telecommunication regulations”, LIRNEasia and UP-NCPAG Singh.A, “The SAARC Report”
29. Nieto, M.J, “ Reflections on the Regulatory Approach to E-Finance”
30. Sultana, “Mobile Banking: Overview of Regulatory framework in emerging markets”, p.g 12, Grameenphone Ltd, Dhaka, Bangladesh
31. Udu-gama.N, 2009, “Mobile Cell Broadcasting for Commercial Use and Public Warning in the Maldives”, LIRNE asia
32. Vamosi, R.,” Mobile Banking Security Watch:Don't get burned by Viruses and Hackers”, 2007, CNET Reviews
33. World-Check, “KYC Compliance Overview”
34. Zelber. S, 2008, “Mobile Banking Bossts Maldives”, mobileopen

35. Jack, W. & Suri, T., "The economics of M-Pesa" 2010
36. "Maldives introduces Mobile Banking", 2008, OneWorld South Asia  
"Maldives mobile banking project", Maldives Monetary Authority "Maldives  
Mobile Banking Project", Ministry of Finance and Treasure
37. "Mobile banking overview", 2009, mobile marketing association
38. "Mobile Banking: The second Wave: Global Mobile Banking Survey 2008",  
Sybase
39. "M-PESA", 2009
40. "Scenarios for Branchless Banking in 2020", CGAP
41. Tae-gyu, K., "South Korea Sets Trends in Global Mobile Banking"

#### **OTHER SOURCE**

1. <http://technology.cgap.org/2009/04/29/you-hate-atm-fees-imagine-what-you%E2%80%99d-pay-if-going-to-the-bank-meant-getting-on-a-boat/#more-864>
2. <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/MALDIVESEXTN/0,,contentMDK:21735163~menuPK:50003484~pagePK:2865066~piPK:2865079~theSitePK:306313,00.html>
3. [http://news.bbc.co.uk/2/hi/south\\_asia/7506656.stm](http://news.bbc.co.uk/2/hi/south_asia/7506656.stm)
4. <http://www.textually.org/textually/archives/2008/07/020873.htm>
5. [http://voicendata.ciol.com/ceoconclave/2009/SAARC\\_Nov09/Interview-Ilyas%20Ahmed,%20%20Maldives.pdf](http://voicendata.ciol.com/ceoconclave/2009/SAARC_Nov09/Interview-Ilyas%20Ahmed,%20%20Maldives.pdf)
6. [http://www.lirneasia.net/wp-content/uploads/2009/07/CB\\_Maldives\\_FINAL\\_2009\\_041.pdf](http://www.lirneasia.net/wp-content/uploads/2009/07/CB_Maldives_FINAL_2009_041.pdf)



7. <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/MALDIVESEXTN/0,,contentMDK:21735163~menuPK:50003484~pagePK:2865066~piPK:2865079~theSitePK:306313,00.html>
8. <http://english.ktf.com.eng/>
9. <http://www.mobilopen.org/2008/07/25/mobile-banking-boosts-maldives/>
10. [http://reviews.cnet.com/4520-3513\\_7-6735587-1.html](http://reviews.cnet.com/4520-3513_7-6735587-1.html)
11. <http://www.ktf.co.kr>
12. <http://www.finextra.com/fullstory.asp?id=19826>
13. <http://www.world-check.com/know-your-customer-kyc-compliance/>
14. <http://www.axisbank.com/xmlapplication/personal/images/kyc-booklet.pdf?uicode=Personal>
15. <http://www.ruralfinancenetwork.org/pages.php?p=54&r=7&ID=35&PHPSESSID=5cfl19ef8c6797207ba94f7e7b984e8c>
16. [http://siteresources.worldbank.org/EXTAML/Resources/3965111146581427871/AML\\_implications\\_complete.pdf](http://siteresources.worldbank.org/EXTAML/Resources/3965111146581427871/AML_implications_complete.pdf)
17. [www.technology.cgap.org](http://www.technology.cgap.org)
18. <http://www.cprsouth.org/wp-content/uploads/drupal/Rasheda%20Sultana.pdf>
19. Lee, T.H, “ Electronic Financial Transactions in Korea”,
20. <http://www.finextra.com/fullstory.asp?id=19758>
21. <http://www.mobilein.com/Perspectives/MobileBanking.html>.
22. <http://www.iflr1000.com/default.asp?page=38&CH=3&sIndex=2&CountryID=22>
23. <http://www.cellular-news.com/story/24733.php>.
24. <http://www.safaricom.co.ke/index.php?id=745>
25. [www.centralbank.go.ke](http://www.centralbank.go.ke)

26. <http://southasia.oneworld.net/ictsfordevelopment/maldives-introduces-mobile-banking>
27. <http://www.safaricom.co.ke/index.php?id=745>
28. <http://www.ruralfinancenetwork.org/pages.php?p=54&r=7&ID=35&PHPSESSID=5cf119ef8c6797207ba94f7e7b984e8c>