

INNOVATION IN MOBILE BANKING SERVICES: SCOPE AND IMPLICATIONS

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ABSTRACT

In modern time, mobile commerce (m-commerce) has emerged as a prominent tool for enabling commercial transactions. The usage of m-commerce for banking services is a recent innovation. Considering the huge subscriber base for mobile devices in India, there exists a huge opportunity for providing innovative mobile banking services. Mobile banking utilizes modern digital technology, reduces payment hassles and improves relationship between the customers and merchants. Despite significant advantages, mobile banking has not been able to make prominent inroads in urban as well as rural areas. In order to bring this gap, mobile payment landscapes, network operators and major players have emerged. They are proving a number of useful services for the benefit of the customers. However, adequate technology and security standards should be maintained while proving these services. These standards help in the unambiguous identification of the payment solutions. Lastly, regulatory environment and the pertinent issues should be taken into consideration while providing mobile banking services.

INTRODUCTION

In the modern business environment, customers' demands have drastically enhanced. Customers demand speed and self-service; ability to do their own product configuration; more integration of product and service; lower costs and high quality; and highly personalized relationships. The conventional financial system has not been able to meet the expectations of customers. Mobile banking services has the potential to change the landscape of the financial world as digital technology can bring significant efficiencies in the payment process. The number of mobile phone users currently is more than the number of borrowers from the banking system (Rangarajan, 2008). There is clear need to increase the outreach of eco-friendly low cost mobile services to every person.

Mobile phones as a delivery channel for extending banking services have off-late been attaining greater significance. Mobile-commerce (M-commerce) is growing dramatically. The global m-commerce market is expected to be worth a staggering US\$1200 billion by 2011. Due to the widespread use of mobile phones today, a number of payment schemes have emerged. These schemes allow the payment of services/goods from mobile devices. The rapid growth in users and wider coverage of mobile phone networks have made this channel an important platform for extending banking services to customers.

CONCEPT

M-commerce can be defined as any electronic transaction or information interaction conducted using a mobile device and mobile networks, for example, wireless or switched public network, which leads to transfer of real or perceived value in exchange for goods, services, information or finances. M-commerce involves m-payment, which is defined as the process of two parties exchanging financial value using a mobile device in return for goods or services. A mobile device is a wireless communication tool including mobile phone, PDAs, wireless tablets and mobile/palm computers (*Mobile Payment Forum of India, 2010*).

In rural India, the mobile banking subscriber base may be low, but the concept is making inroads into Indian villages through micro banks that run on mobile phones using near-field communications. In a mobile-based micro bank, the mobile phone acts as a bank branch by storing the customer database. It also has a smartcard, which biometrically stores the identity of the customer including name, address, photograph, fingerprint templates and relevant details of savings or loan accounts held by the issuing bank. Customers are given an account number, while agents handle deposits and disburse cash. Mobile banking enhances delivery capabilities by using Internet, SMS, GPRS, PDA etc, thus improving the relationship between customers and merchants. Consumers can securely and conveniently pay through their mobile phones or over the Internet. There are no hassles of carrying credit cards and no need to furnish the card number on every occasion.

MOBILE SERVICES: GROWTH POTENTIAL VS. RELUCTANCE

India is the world's second largest mobile market with over 650 million subscribers as of July 2010 and the growth rate is pegged at 18-19 million per month (*Kumar, 2011*). But it still only has 15 million to 20 million registered users for mobile banking (*Prasad, 2011*). While the subscriber base for mobile banking may be small, such services are gaining popularity in rural India through micro banks that run on mobile phones. In rural India, 3.8 million people are utilizing mobile banking services through micro banks (*Prasad, 2009*). According to *IAMAI (2008)*, mobile Value Added Service (VAS) sector (a part of which is m-commerce) is expected to grow from Rs 5,780 crore (June 2008) to Rs 16,920 crore in Jan 2011 as a direct benefit of the growth in mobile telephony.

In India, mobile banking services are offered at no cost. Despite this, the urban mobile subscriber base of has made little attempts to make banking transactions. There are two main reasons for the low acceptance among urban users:

- i. These subscribers have accessibility to various alternative modes of transaction and payment such as Internet banking, ATMs and credit cards
- ii. Security remains a concern as customers are ambiguous about this new channel, its service offerings and smooth processing.

The bank sends information such as the balance in the user's account and reminders about credit card payments through SMS. However, there are very few people who actually pay bills and transfer funds using mobile banking.

Rural India is a huge and challenging market insofar as banking is concerned. India has close to 6,41,000 inhabited villages (*Wikipedia, 2011*) but only 32,919 rural bank branches (*Chandra, 2011*). Due to this, it difficult to establish brick-and-mortar banks everywhere. India's rural markets are difficult to tap due to high illiteracy, poor infrastructure that inhibits accessibility, and lack of technology.

MOBILE PAYMENT LANDSCAPES, NETWORK OPERATORS AND MAJOR PLAYERS

In general, mobile payments offerings are provided by organizations within two separate and distinct industries: Payments and Telecommunications. The market consists of payments landscapes (traditional banks, payment brands and processors, and established non-banks) and mobile telecommunications network operators (mobile operators and start up technology providers). Major payment landscapes and network operators are displayed in Figure 1. These parties have a number of concerns relating to customer ownership, underlying transaction economics, and the share of revenues generated from mobile payments.

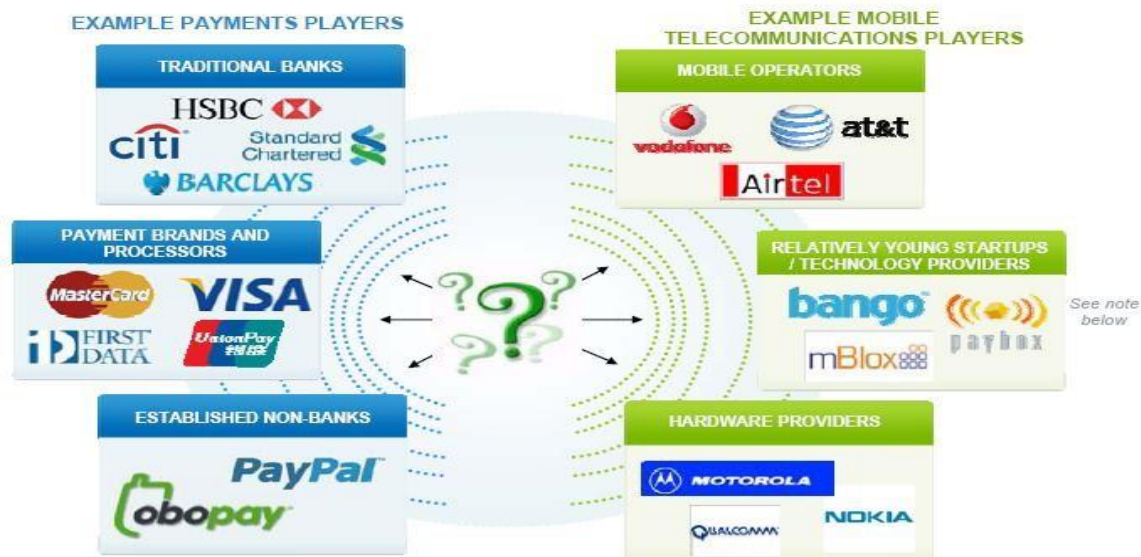


Figure 1: Mobile Payment Landscapes and Network Operators

Major players providing mobile banking services include State Bank of India (SBI), Union Bank of India, Axis Bank, Andhra Bank, State Bank of Hyderabad, Andhra Pradesh Grameen Vikas Bank and Punjab National Bank. Even telecom providers such as Bharti Airtel and Reliance Communications, have tied up with banks to extend their mobile remittance services to rural areas. Several technology firms such as Ekgaon Technologies and Spanco Systems have also stepped up to offer mobile banking tools. NXP Technologies has done pilot projects for micro banking in areas such as Aizwal (Mizoram), Medak (Andhra Pradesh) and Pithoragarh (Uttarakhand).

MOBILE BANKING SERVICES

With the rapid growth in the number of mobile phone subscribers in India, banks have been exploring the feasibility of using mobile phones as an alternative channel of delivery of banking services. Several public sector banks have set up or are in the process of setting up mobile phone-based micro banks. Some banks have started offering information based services like balance enquiry, stop payment instruction of cheques, transactions enquiry, location of the nearest ATM/branch etc. Acceptance of transfer of funds instruction for credit to beneficiaries of same/or another bank in favor of pre-registered beneficiaries have also commenced in a few banks.

Mobile payments consists of

- Secured wallets (prepaid accounts)
- Top-up wallets with credit card/online debits
- Use of wallet through mobile/Internet/PDAs
- Processing of transactions and settlements
- Personalisation (defining limits and auto top-up)
- Transaction history
- Profile management
- System administration
- Merchants/Services management

The mobile banking services offered in India are compiled and presented in Table 1.

Table 1: Mobile Banking Services in India

Service	Description	Technology Availability
Eko	Innovative service by State Bank of India (SBI) to increase the reach of financial institutions to urban as well as rural customers	Mobile phones, and retail outlets to act as distribution agents
FINO	Financial Information Network & operations (FINO) Ltd is an integrated technology platform and delivery channel that enables outsourcing and servicing of world's micro customers on a large scale	Mobile biometrics, POS, smartcards, ATM/Micro deposit machine
ALW	A Little World (ALW) provides government to payment services with specific focus on reaching out to masses with lowest available communication infrastructure	RFID smart cards, GPRS, fingerprint biometrics
OboPay	It provides universal access to financial services through customer's mobile phone. Enables customer's to send and receive payments anywhere in India. Service provided in India by	Mobile payments are linked to customer's bank account

Service	Description	Technology Availability
	YES Bank, Nokia and Union Bank of India	
Green Mobile	It is a financial inclusion based program. It currently targets migrant workers. In India, the service has been launched by Tata Indicom, Corporation Bank and Paymate	Mobile phone, windows based .Net framework technology

Certain mobile payment models in India along with their details are presented in Table 2.

Table 2: Mobile Payment Models in India (*Source: Pandey and Shukla, 2010*)

Payment Model	Cost	Convenience	Security
Paybox	An annual fee is charged to customer, but involves no transaction fee. Peer-to-peer transaction comes with extra cost. Infrastructure costs are low.	Useful for macro, micro and peer-to-peer transactions. Customer is required to know only the PIN number to participate.	Customer personal data is kept in the Paybox server and not exchanged with other participants. Fraud prevention techniques are employed.
IPIN	No setup fee. Fees are based on transactions. Infrastructure costs are low.	Several payment options including micro-payments are offered. Interoperability between groups of individual payment networks is provided.	Enterprise houses users' personal data and guarantees privacy.
Vodafone m-PayBill	Membership is free. No basic or transaction fees. Infrastructure cost does not exist except that the customer might require a WAP enabled phone.	Only applicable to micro payments. Payment process is more customer friendly. Customer who registered with Vodafone operator can automatically use solution.	Interoperability between various countries is provided, but requires transfer of personal information. The privacy of data will depend on the countries' privacy policy.
m-Pay	Registration is free. A new Orange SIM card is needed, which comes	Customers need to download a script to activate applications on	Payment is carried out by exchange of certificates. Customer

Payment Model	Cost	Convenience	Security
	with a cost. Payment confirmation is also provided with a cost.	SIM card. Payment transaction is fast.	receives payment confirmation in the form of SMS. Server verifies every transaction from SIM card.
Jalda	Content provider charges a small transaction fee from customers' phone bills. The customer might require a WAP enabled phone.	It can be used for normal as well as micro-payments, and supports inter-operability but has not been enforced as a global standard.	Usage of strong authentication and non-repudiation protocols guaranteed. Payment receipt is sent to user.

TECHNOLOGY STANDARDS

Banks offering mobile banking service must ensure that customers having mobile phones of any network operator are in a position to avail the service. Minimum restrictions should be imposed on the customers of particular mobile operator. The following technology standards should be followed:

- The long term goal of mobile banking framework in India should be to enable funds transfer from account in one bank to any other account in the same or any other bank on a real time basis irrespective of the mobile network. This would require inter-operability between mobile banking service providers and banks. This would also enable development of a host of message formats. To ensure inter-operability between banks and between their mobile banking service providers, banks need to adopt the message formats like ISO 8583 with suitable modifications to address specific needs.
- To meet the objective of a nation-wide mobile banking framework in order to facilitate inter-bank settlement, a robust clearing and settlement infrastructure operating on a 24x7 basis should be set up.
- A pertinent customer complaints and grievance redressal mechanism should be formed. The customer/consumer protection issues assume a special significance in view of the fact that the delivery of banking services through mobile phones is relatively new. In cases where the customer files a complaint with the bank disputing a transaction, it should be the responsibility of the service providing bank to expeditiously redress the complaint. The grievance handling procedure including the compensation policy should be disclosed. Banks should set up a help desk and disclose the details of the help desk and escalation procedure for lodging the complaints on their websites. Such details should also be made available to the customer at the time of sign up.

- iv. In the mobile banking scenario, the transactions are completely instantaneous and are incapable of being reversed. It becomes impossible for the banks to stop payment in spite of receipt of stop payment instruction. So, there are very limited or no stop-payment privileges available with banks to stop mobile banking transactions. Therefore, banks offering mobile banking service should notify the timeframe and the circumstances in which any stop-payment instructions could be accepted by the customers.
- v. Banks should put in place appropriate risk mitigation measures like transaction limit (per transaction, daily, weekly, monthly), transaction velocity limit, fraud checks, AML checks etc depending upon their own risk perception.

SECURITY STANDARDS

Information security is most critical to the business of mobile banking services and its underlying operations. Therefore, technology used for mobile banking must be secure and should ensure confidentiality, integrity, authenticity and non-repudiation. Following security standards should be adhered to:

- i. Banks are required to maintain secrecy and confidentiality of customers' accounts. In the mobile banking scenario, the risk of banks not meeting the above obligation is high. Banks may be exposed to enhanced risk of liability to customers on account of breach of secrecy, denial of service etc. This may be caused by activities such as hacking or other technological failures. So, the banks should institute adequate risk control measures to manage such risks.
- ii. The dependence of banks on mobile banking service providers may place knowledge of bank systems and customers in a public domain. Mobile banking system may also make the banks dependent on small firms with high employee turnover. It is therefore imperative that security and integrity of transactions are protected. So, the mobile banking servers at the bank's end or at the mobile banking service provider's end should be certified by an accredited external agency. In addition, banks should conduct regular information security audits on the mobile banking systems to ensure complete security.
- iii. Application level encryption should be preferred over network and transport layer encryption. Proper level of encryption and security should be implemented at all stages of the transaction processing. The endeavor should be to ensure end-to-end encryption of the mobile banking transaction. Adequate safe guards should also be put in place to guard against the use of mobile banking in money laundering, frauds etc.
- iv. Proper firewalls, Intruder Detection Systems (IDS), data file and system integrity check, surveillance and incident response and containment procedures should be implemented.
- v. Appropriate physical security measures should be implemented to protect the system gateways, network equipments, servers, host computers, and other hardware/software from unauthorized access and tampering. The data centre of the Bank and service providers should have proper wired and wireless data network protection mechanisms.

- vi. For channels which do not contain the phone number as identity, a separate login ID and password should be provided to ensure proper authentication. Internet banking login IDs and passwords should not be allowed to be used for mobile banking.
- vii. Proper and full documentation of security practices, guidelines, methods and procedures used in mobile banking and payment systems should be maintained. It should be kept up to date based on the periodic risk management, analysis and vulnerability assessment carried out.
- viii. Bilateral contracts drawn up between the payee and payee's bank, the participating banks and service provider should clearly define the rights and obligations of each party.
- ix. Banks should make mandatory disclosures of risks, responsibilities and liabilities of the customers on their websites and/or through printed material. Periodic risk management analysis, security vulnerability assessment of the application and network should be done at least once in a year.
- x. In India, the Information Technology (IT) Act, 2000, provides for a particular technology as a means of authenticating electronic record. Any security procedure adopted by banks for authenticating users needs to be recognized by law as a substitute for signature. Any other method used by banks for authentication is a source of legal risk. Customers must be made aware of the said legal risk prior to sign up.
- xi. The Consumer Protection Act, 1986 and IT Act 2000 defines the rights of consumers in India and is applicable to banking services as well. Currently, the rights and liabilities of customers availing of mobile banking services are being determined by bilateral agreements between the banks and customers. Banks should take into account the risks arising out of unauthorized transfer through hacking, denial of service on account of technological failure etc. Banks providing mobile banking service need to assess the liabilities arising out of such events and take appropriate counter measures like insuring themselves against such risks.

REGULATORY ENVIRONMENT AND ISSUES

In order to ensure a level playing field, Reserve Bank of India (RBI) has brought out a set of operating guidelines for adoption by banks. These guidelines are framed so that mobile banking transactions that involve credit/debit to customers' accounts can be conveniently undertaken. They also cover assessment of the bank accounts by customers for non-monetary transactions like balance enquiry etc. Banks wishing to provide mobile banking services need to seek prior one time approval of the RBI by furnishing full details of the proposal.

In 2006, RBI announced a new policy initiative to allow banks to do business using the "business correspondent" framework. Under this model, third parties such as Zero Microfinance and Savings Support Foundation (ZMSSF) conduct business in remote areas on behalf of banks. ZMSSF has 3.8 million enrolled customers and runs 8,300 micro-bank branches in northeast India and states such as Andhra Pradesh, Orissa and Uttarakhand (*Prasad, 2009*).

Telecom Regulatory Authority of India (TRAI) and the Department of Telecomm (DoT) are trying their level best to have international companies in the Indian Telecom Market. TRAI has passed the

regulation whereby any telecom company can start offering its own services through a virtual network, without having to invest crores of rupees for setting up the infrastructure and acquiring the license for the same. This move would propel small companies and international players to enter the growing Indian telecom industry. Owing to the spectrum availability and usage characteristics, most players would target the districts or rural sectors.

By allowing Mobile Virtual Numbers (MVN) to operate freely in the country, TRAI is trying to improve the quality of service presently offered by the major service providers. Two of the major providers in the country, Airtel and Vodafone cater to 69 million and 49 million customers respectively. With the roll out of MVN, the widening gap between the service provider and the customer will be greatly reduced. The roll-out may also trigger tighter competition, thereby affecting the prices for the consumer.

The regulatory issues affecting the mobile services are:

- i. Only banks which are licensed and supervised in India and have a physical presence in India are permitted to offer mobile banking services.
- ii. The services are restricted only to customers of banks and holders of debit/credit cards issued as per the extant RBI guidelines.
- iii. Only Indian rupee based domestic services are provided. Use of mobile banking services for cross border transfers is strictly prohibited.
- iv. Banks may also use the services of business correspondent appointed in compliance with RBI guidelines, for extending mobile banking facility to their customers.
- v. Only banks who have implemented core banking solutions are permitted to provide mobile banking services.
- vi. Banks are required to file Suspected Transaction Report (STR) to Financial Intelligence Unit – India (FID-IND) for mobile banking transactions as in the case of normal banking transactions.
- vii. Banks are required to put in place a system of document based registration with mandatory physical presence of their customers, before commencing mobile banking service.
- viii. On registration of the customer, the full details of the terms and conditions of the service offered are required to be communicated to the customer.

CONCLUSION

It is clear that mobile banking services are changing the landscape of modern business. It appeals to the customers as well as service providers as it brings significant efficiencies to the payment process. In order to enhance the efficiency of the payment process and make it further convenient for customers, mobile banking services should be inter-operable, address customer complaints and adopt appropriate risk mitigation measures. Robust security system should be implemented to ensure confidentiality, integrity, authenticity and non-repudiation. Regulatory environment should be conducive the growth of the mobile banking services. The need of the hour is to work with clarity and

consistency and speed up the process of moving towards greater openness and great certainty in the mobile payment sphere.

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