

Mobile Banking & M-Commerce and Related Issues

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Chapter-1

Introduction

1.1 'Commerce' is the trading of 'something' of value between two entities. That 'something' may be goods, services, information, money, or anything else the two entities consider to have value. Trading was the main facility in earlier times with barter facility for goods and services. Later, currency was introduced as standardized money to facilitate a wider exchange of goods and services. Today's era is an information era and the world is passing through an Information revolution. One of the profound consequences of the information revolution is its influence on how economic value is created and extracted. Today the information is more easily accessed, absorbed, arranged and is priced in different ways. Markets are expanding from regional to global. Knowledge is replacing land, labour and capital as the key value driver. Intelligent networks and virtual spaces are limiting the need for surface and air travel. With the technological progression particularly in computers and Internet field has led to the birth of electronic commerce (E-commerce) which enabled the business processes to be more simplified, efficient, quick and accurate resulting in improved productivity with higher satisfaction level to the customers. Also, improved processes resulted in reduced cost of production and transaction cost and therefore the profitability of businesses increased manifold. The emerging wireless and mobile networks have added another dimension of mobility and extended e-commerce to another research and application subject called mobile commerce popularly known as **m-Commerce**.

1.2 M-Commerce is the buying and selling of goods and services through wireless handheld devices such as mobile telephone and

personal digital assistants(PDAs). M-Commerce is a platform where a mobile customer can avail various banking and other related commercial facilities through his mobile phone. M-Commerce is not the transaction itself. It provides services and information, which can trigger a future transaction. The scope of m-Commerce therefore goes beyond the initial one time commercial transaction. The main areas of m-Commerce use are in text messaging or SMS, mobile payment, financial & banking services, logistics, goods/services buy/sell, information services and wireless customer relationship management etc.

Benefits of m-Commerce:

1.3 The benefits of m-Commerce with respect to customers, merchants and banks are as below:

- Ubiquitous Personalized service – anywhere, anytime
- Remote payment for utility bills; insurance premiums; credit card bills; EMIs etc
- Integration with existing payment systems e.g. Credit/debit card payment option
- Promotion of Location based services
- Faster transaction time
- New business opportunities for stakeholders
- Point of Sale(POS) device may not require
- Branding and business opportunities for banks
- Higher volume in banking with less cash transaction
- Penetration into cash dominated category

- Help developing customer loyalty
- Reduction in cost of infrastructure and usages

Types of m-Commerce

1.4 The m-Commerce can be classified broadly in the three main categories:-

M-Payment: through Credit/debit cards:

Mobile phones linked to credit/debit cards can be used to make payments. e.g. M-payment applications like mChek, PayMate, ngpay etc

E-Money:

Cash loaded in the mobile phones. Consumers use this virtual cash as real value for all types of transactions. E.g. Prepaid cash card, recharge voucher amount etc

M-Banking:

Mobile phone used for accessing the bank accounts. All payments are routed through the bank. e.g. Balance query, share trading alert, banking transactions etc.

Applications of m-Commerce:

1.5 Various applications of Mobile Commerce are given the below Table:-

Application	Example of m-Commerce services offered
Mobile banking	Mobile Accounting Mobile online stock transaction Mobile banking information Payment for insurance, recharge coupons etc
Mobile information services	Current affairs Tour and travel information Mobile search engines and directories
Mobile shopping	Purchase of goods and services Content purchase & delivery
Mobile ticketing	Sports and cultural events Cinema Tickets
Mobile marketing	Mobile coupons Mobile newsletters
Mobile entertainment	Mobile Gaming Download of music, video and ring tones Location based entertainment services

Drivers of m-Commerce

1.6 There are various factors responsible for the growth of m-Commerce. A few of them are listed below:-

- Changing behavior pattern and expectation of consumers with regard to shopping and brand loyalty

- Businesses are changing the way they do business. Mobile phones are enabling these changes to happen.
- Tremendous growth in mobile telephony.
- Exponential growth of consumer interest and adoption of the Internet and e-commerce.
- Development of real-time transfer of data over 2.5G/high speed internet network. With the introduction of 3G services and with the expected private sector participation, 3G will enable faster data transmission and ubiquitous connectivity.
- The evolution of the handheld devices incorporating Wireless Application Protocols(WAP) and GPRS.
- With the rise in the number of subscribers of database services, the cost of entry into m-Commerce is low for most entrants;
- Because of the benefits of m-Commerce as described above it is attracting players from all economic sectors from technology, finance, retail, media, all anticipating that m-Commerce will help in increasing customer acquisition and retention and generate new revenue opportunities for them.

1.7 By 2010, more than three billion people are expected to own mobile phones in the world. India is the second largest nation in the world in terms of number of mobile subscribers and is growing at the fastest pace in terms of number of mobile subscribers. There are over 545million mobile phones (as on Jan'2009) in India and about 18 million are being added every month. As per the reports available, there are about 149 million(~25%) subscribers registered for the data services(December 2009 figure). However, as compared to number of mobile subscriber base in India, user transactions

through m-Commerce per day are abysmally low (5-10million) and it can be said that presently M-Commerce is in the nascent stage in India. However, it has great potential of expansion of business transaction particularly in non-cash category. If properly harnessed, it can help in facilitating inclusive growth particularly in rural India.

Chapter-2

Mobile Payment Solutions & Technologies

2.1 As mentioned in the first chapter there three broad categories of m-Commerce. Mobile payment is one of the prominent m-Commerce methods which are used actively by majority of the user of m-Commerce. This chapter deals with the various solutions and technologies for mobile payments.

Mobile Payment (m-payment) Solutions

2.2 There are broadly three different models available for m-payment solutions on the basis of payment :

- Bank account/debit card based
- Credit card based
- Telecommunication company billing based

➤ Bank Account/Debit based m-payment

2.3 In this model, the bank account/debit card is linked to the mobile phone number of the customer. When the customer makes an m-payment transaction with a merchant, the amount from the bank account of the customer is debited and the value is credited to the merchant account.

➤ Credit Card based M-Payment

2.4 In the credit card based model, the credit card number is linked to the mobile phone number of the customer. When the customer makes an m-payment transaction with a merchant, the credit card is charged and the value is credited to the merchant account. Credit card based

solutions have the limitation that it is heavily dependent on the level of penetration of credit cards in the country.

➤ **Telecommunication Company Billing of M-Payments**

2.5 Customers make payment to merchants using his or her mobile phone and this may be charged to the mobile phone bills of the customer. The customer then settles the bill with the telecommunication company. This model is not available at present in India.

Technologies for Mobile Payments

2.6 The mobile technology landscape provides various possibilities for implementing m-payments. Mobile phone may send or receive information through channels like– SMS, USSD or WAP/GPRS. The choice of the channel influences the way m-payment schemes are implemented. Secondly, the m-payment client application may reside on the phone or else it may reside in the subscriber identity module (SIM). The detail about customer’s bank account/credit/debit card is stored inside the phone/SIM. When customer wants to transfer the money to a merchant he accesses the application and enters phone/account number. The application running on his mobile encrypts the details of account-number/credit/debit-card including the amount to be transferred to the merchant. The customer enters MPIN (Mobile PIN) number. The merchant is alerted for confirmation. Once the confirmation is received, the amount is transferred from the customer account to the merchant account. There are other methods like near field communication technique, which is a contactless application. Some of these techniques are described briefly as below:-

➤ **Short Message Service (SMS)**

2.7 This is a text message service that enables short messages that can be transmitted from a mobile phone. Short messages are stored and forwarded by SMS centers. SMS messages have a separate transmission channel than the voice channel. SMS can be used to provide information about the status of one's account with the bank or can be used to transmit payment instructions from the phone.

➤ **Unstructured Supplementary Services Delivery (USSD)**

2.8 USSD is a technology unique to GSM. It is a capability built into the GSM standard for support of transmitting information over the signaling channels of the GSM network. USSD provides session-based communication, enabling a variety of applications. USSD is session oriented transaction-oriented technology while SMS is a store-and-forward technology. Turnaround response times for interactive applications are shorter for USSD than SMS.

➤ **Wireless Application Protocol(WAP)/ General Packet Radio Service (GPRS)**

2.9 GPRS is a packet-switched data service available to GSM users. GPRS enables services such as WAP access, Multimedia Messaging Service (MMS), and Internet communication services such as email and World Wide Web access in mobile phones. With the help of WAP/Internet one can use m-payment from his mobile device.

➤ **Phone-based Application (J2ME/BREW)**

2.10 The client m-payment application resides on the mobile phone of the customer. This application can be developed in Java (J2ME) for GSM phones and in **B**inary **R**untime **E**nvironment for **W**ireless (BREW) for

CDMA phones. Personalization of the phones can be done over the air (OTA).

Near Field Communication (NFC)

2.11 NFC is the fusion of contactless smartcard (RFID) and a mobile phone. The mobile phone can be used as a contactless card. NFC enabled phones can act as Radio-Frequency Identifier (RFID) tags or readers. This creates opportunity to make innovative applications especially in ticketing and couponing. This technology is becoming increasingly popular and is being used in the developed countries being comparatively safe and secure method of mobile payment.

Dual Chip

2.12 Normally, SIM cards are purchased in bulk by telecom service provider and then they customised the SIMs for use before sale. For m-payment application in SIM the application provider writes m-payment application in collaboration with the telecommunications service provider. To avoid this, dual chip phones have two slots one for a SIM card for the purpose of telephony and another for a payment chip card. Financial institutions may prefer this approach as they can exercise full control over the chip and the mobile payment process. But, customers would have to invest in dual chip mobile devices.

Mobile Wallet

2.13 An m-payment application software that resides on the mobile phone with details of the customer (and his or her bank account details or credit card information) which allows the customer to make payments using the mobile phone is called as a mobile wallet. Customers can multi-home with several debit or credit payment instruments in a single wallet. Several implementations of wallets that are company-specific are in use globally.

Comparison of medium of communication in m-Commerce:

2.14 The table below compares SMS, GPRS and USSD that can be used in making transaction, communication or payment advice in m-Commerce.

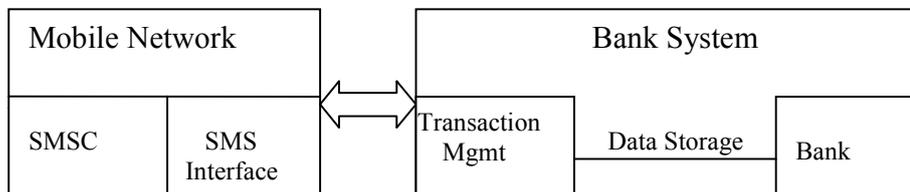
Comparison of medium of communication in m-Commerce Technology					
Sl No	Elements	SMS Based		GPRS based	USSD based
		SIM based SMS	Phone based SMS		
1	Data carrier	SMS	SMS	GPRS	USSD
2	Data storage	SIM memory	Phone memory	Not stored	Not stored
3	Card present/ card not present TXN	Card present	Card present	Card not present	Card not present
4	User interface	Menu based	Menu based	Interactive	Interactive

Network Architecture, and Models m-Commerce

2.15 The m-Commerce implementations models are primarily of two types:-

(a)The Access Model – In this model, the mobile operator is restricted to just the access portion of the service. Here mobile network establishes

relationship with a normal bank with both parties marketing the service. The network provides a 'front-end' to the SMS system that is linked to the bank's system. This interface system is designed to take care of security, transaction routing and the management of the SMS responses back to the customer, based on information supplied by the banking system. This covers the automatic account update whenever a transaction is initiated. The architecture can be simply represented by the following diagram:-



In this model, the banking system comprise of three elements. The transaction module maps the actual transactions, determining the settlements that must be made and generating the transaction confirmation messages that must be sent to the users. The data storage module holds the account balances for all the users including the retailers and other service providers, while the bank module represents the physical cash storage facility and the holder of the banking license.

The Access Model is employed by SMART Money in the Philippines, MTN Bank in South Africa, Safari.com in Kenya and Tanzania as well as Celpay in Zambia and the Democratic Republic of Congo.

(b) The Hybrid Model- This model is the more complex arrangement whereby the network operator has a greater role in the provision of the service. In this model network operator also perform the activities of a banker after taking necessary approval from the Central Bank. His activities can range from including just the transaction management

aspect, right through to the stage where the network operator also holds a banking licence and provides all aspects of the service.

2.16 Of the two approaches, the Hybrid model is more complex as the network operator is required to follow rigorous rules covering issues of liquidity, banking security and anti money laundering. The implementation of the Hybrid model will necessarily involve extensive negotiations with the banking regulator. This model is adopted by GLOBE Telecom in the Philippines. In India presently access model as described above is employed.

Chapter-3

Present scenario in the Developed/Developing world

3.1 M-Commerce applications like m-payment are becoming popular in developed and developing countries due to different reasons. In the developed countries the mobile payment is complementary to the traditional payment systems and is popular due to flexibility, ubiquitous nature and convenience in conducting transactions. It is driven by the industry and is an enabler for wide range of m-Commerce Services viz. m-ticketing, m-retail, m-banking etc. In many developing countries, on the other hand, due to lack of banking facilities in the rural area, lack of alternative solutions, accessibility& affordability issues and limited micro payments, the use of mobile payment is becoming popular due to the reach of mobile phones and their ability to offer m-Commerce services. Mobile money applications are emerging as potent financial tools in rural and remote areas of the globe, allowing people with no bank accounts to get paid, send remittances or settle their bills. Mobile phones are also being used to transfer funds between people. These applications are working in countries like Philippines, Kenya, South Africa, Tanzania etc. M-Commerce experience in some of the developed and developing countries are given below:-

3.2 In Kenya a popular mobile payment service is called **M-Pesa**, which is designed specifically to provide financial Services to people without access to the conventional banking. To avail this service one does not need any bank account, there is no joining fee, no monthly charges and no minimum balance to be maintained. The service provider has the Trust Account which owns the bank account with the real money. In this system the e-money is transferred from one person to other by SMS. M-Pesa is a fast, safe and easy of use mechanism.

3.3 In Philippines, **SMART Money** is the Mobile Banking product offered by SMART Communications which allows customers to transfer funds from their bank accounts to their SMART mobile service account including prepaid recharging. Facilities exist for the customer to deposit cash, withdraw cash, top up the mobile phone prepaid credit levels from that account or other bank accounts, without going near a bank or a SMART office. The service is menu-driven and the customer can perform all necessary actions using the phone alone.

3.4 In Afghanistan, national police is testing a service from the mobile operator to pay for its officers. In this case an Afghan police officer gets his salary in a text message on his mobile phone.

3.5 In South Africa, companies like Wizzit, Fundamo, and MTN Banking are using M-Commerce Services. Wizzit has positioned itself as a virtual bank and has no branches of its own mobile phone subscription. Customers can use their phone to make person to person payments, transfer money, purchase prepaid electricity and buy airtime for prepaid mobile phone.

3.6 In Europe, the European Commission has vision of a mobile Europe, where its citizens freely move among the EU countries, and seamlessly enjoy services coming from the communication, banking, government, and health domain considerable efforts are being made to promote the converged products and services that go beyond the national borders. Currently applications namely 'simpay', 'starmap', 'mobile alliance', 'Mobey Forum' etc are operating m-Commerce services in Europe.

3.7 With the help of European Commission a project called Secure Mobile Payment Service (SEMOPS¹) is developed for an open, cross-border based secure mobile payment service. SEMOPS takes into account the different requirements of the stakeholders and addresses them in innovative ways. Trust, security and privacy have been tackled in order to comply with visions of mobile Europe. The issues like open architecture, multilingualism, real-time interaction, multiple platform support, user-friendliness, cross-border support, open business model etc have been addressed. It is commercially launched in Hungary, and pilots have been completed in Greece and Italy.

3.8 Mobile payment services have been fairly successful in Asia especially in South Korea, Japan, Philippines and other Asian countries (e.g., Mobile Suica, Edy, Moneta, Octopus, G-Cash). The M-payment in these countries has been penetrated in almost all sectors. South Korea is moving towards NFC based contactless technology.

3.9 In USA, mobile payments were slow to take off initially due to availability of other alternatives. However, it is also moving towards NFC based contactless mobile payments.

3.10 In India, though the M-Commerce is still in its nascent stage with about 5-10 million transactions per day, however, it is picking up fast. The main mobile payment platforms are mChek, ngpay, Obopay, PayMate, ATOM, Oxicash, etc. The Reserve bank of India (RBI) issued guidelines for mobile banking in October, 2008 with the limit on per day transaction as Rs10,000/. This has now increased to Rs 50,000/- per day. This will certainly push the demand of m-Commerce/M-banking. With the introduction of 3G/BWA service in the country many more mobile applications will develop and the eventual movement from

¹ http://www.semops.com/uploadfiles/SEMOPS_Symptotic2004.pdf

2G/2.5G to 3G/4G networks will provide the infrastructure for the companies to move forward with the wireless technology applications.

Chapter-4

Existing frame work for m-Commerce in India

4.1 In India, the M-Commerce is primarily of the nature of M-Banking. For making any transaction a customer has to have his bank account in a bank and he has to register himself with the bank for operating his m-Commerce services. Reserve bank of India(RBI) issued operative guidelines m-Commerce in Oct,2008.

RBI Guidelines on M-Banking

4.2 In the beginning, with the proliferation of mobile phones in various states, some banks started offering information based services like balance enquiry, stop payment instruction of cheques, transactions enquiry, and 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 had also commenced in a few banks. Later Reserve Bank of India(RBI) had set up the 'Mobile Payments Forum Of India' (MPFI), a 'Working Group on Mobile Banking' to examine different aspects of M-Banking. The Group had focused on three major areas of M-banking, i.e. (i) technology and security issues, (ii) business issues and (iii) regulatory and supervisory issues. In October,2008 RBI brought out a set of operating guidelines for adoption by banks. These guidelines are under various heading like Regulatory & Supervisory issues, Technical issues, Interoperability etc. Main points in the guidelines are:-

- Only licenses Indian banks having core banking facility were permitted to offer M-banking services, within the country, in Indian Rupees only.

- The M-banking has been restricted only to customers of banks and/or holders of debit/credit cards. The customer has to physically present in the bank and registered himself for M-banking.
- From the security transaction point of view it is mandatory for the banks to follow the guidelines issued by Reserve Bank on “Know Your Customer (KYC)”, “Anti Money Laundering (AML)” and Combating the Financing of Terrorism (CFT). Banks have also been mandated to have secure M-banking transactions and they have to ensure confidentiality, integrity, authenticity and non-repudiability of the transaction.
- To ensure inter-operability between banks, and between their mobile banking service providers, banks have been asked to adopt the message formats like ISO 8583, with suitable modification to address specific needs.
- From security point of view, banks are required to ensure proper level of encryption and security at all stages of the transaction processing and to ensure end-to-end encryption of the mobile banking transaction. Validation of transaction should be through a two factor authentication with provision that the mPIN (M-Personal Identification Number) shall be stored in a secure environment.
- To guard against the use of mobile banking in money laundering, frauds etc. The guidelines with respect to network and system security have also been issued for the banks.

M-Commerce Processes

4.3 On implementation of above guidelines following are the M-Commerce Processes:

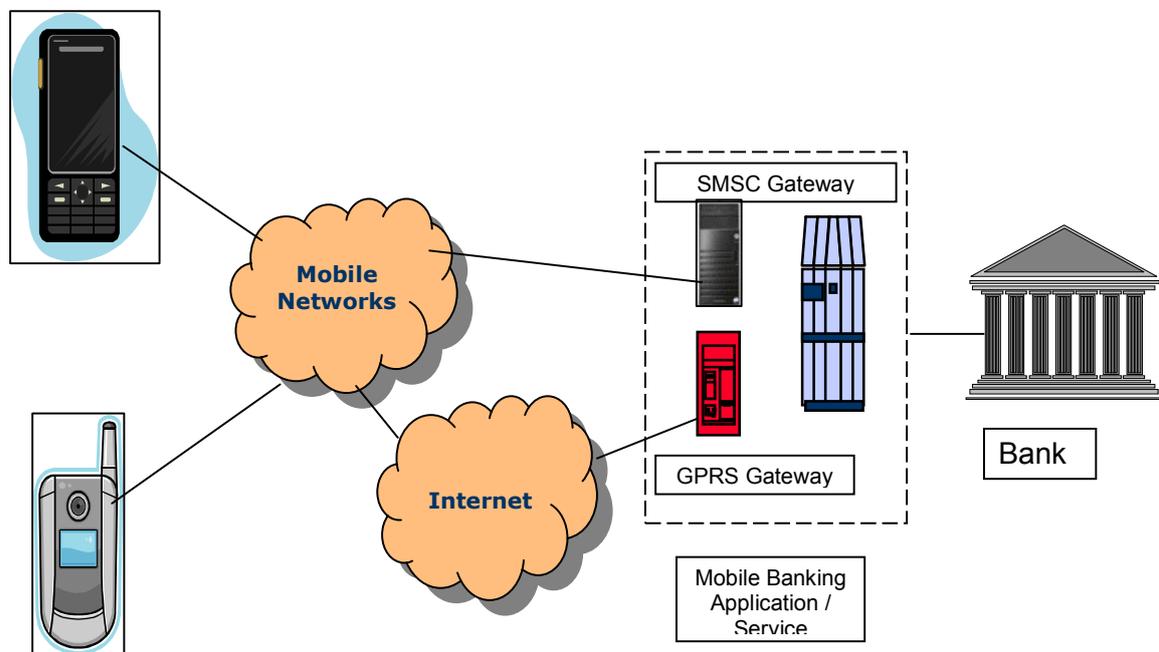
- Customer desiring m-Commerce services registers himself with his bank.
- The application for M-banking is downloaded, wherever required, via either Over the Air (OTA) or from internet on the mobile phone having required features (Java/GPRS).
- M-Commerce application is initiated by password / MPIN generated after downloading the software from the Mobile banking Application Service (MBAS) provider

4.4 Once application is downloaded the following are possible transaction flows in m-Commerce.

Transaction flows in case of m-Commerce

4.5 Possible overall transaction flows for intra-bank and inter-bank transactions are:-

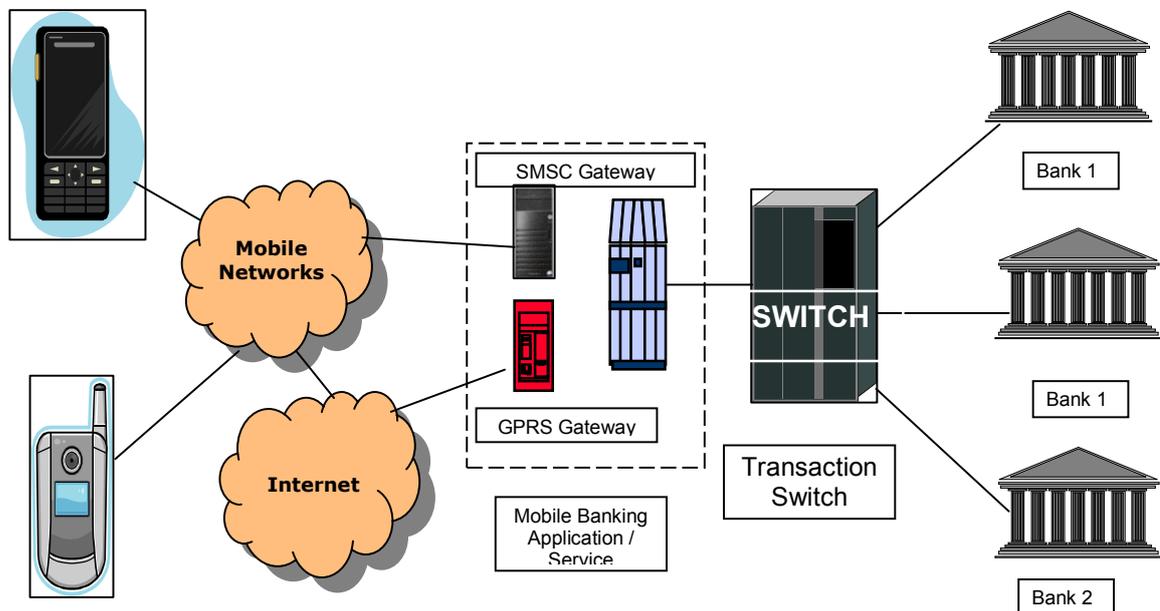
Intra-bank transaction flows²:-



² Source:-www.mpf.org.in

- Bank connects to Mobile networks via MBAS Provider.
- Sender and Receiver perform a registration at Bank
- MBAS stores card number, or account number and Bank ID
- Sender specifies a recipient Mobile number / account number and initiates a transfer request
- MBAS performs checks and forwards the request to the Bank
- Bank validates the From/ To accounts, performs a fund transfer; responds to the sender and the receiver via MBAS.
- In the intra-bank transaction case service offerings is for bank's customers only and Banks can offer cutomised services. Transaction processing and settlement transactions can be settled by the bank itself.

Inter-Bank transaction flows³:-



³Source:- www.mpf.org.in

- MBAS connects to the mobile networks, and connects to a Transaction Switch, which in turn connects to Banks
- Same Sender / Receiver Registration process as intra-bank transfer case
- Sender (of Bank 1) specifies a recipient Mobile / account number of other bank (Bank 2) and initiates a transfer request
- Bank 1 validates the 'From' account, performs a debit and returns status to Switch
- Switch sends the credit leg to Bank 2
- Bank 2 validates the credit account, and responds to Switch
- If invalid 'To' account, sends a failure message to Switch
- Bank 1 reverses the debit, sends out a failure message to Sender.
- Service offerings in case of inter-bank transaction case are:-Transfer of funds across banks account and Purchase / payments. In this case Transaction processing and settlement for Intra bank transaction settlement by each bank and in case of Inter bank the settlement reports are generated by the Switch for settlement, by the Settlement Bank / or settlement Agency.

M-banking platforms/services agencies in India

4.6 In India, the M-Commerce/M-banking services are run by many Mobile banking application service providers with their tie-ups with banks and the telecom service providers. Different technologies and types of applications are available from them on the mobile platform; each offering a matrix of advantages and disadvantages, especially when the needs of the disadvantaged segments are taken into consideration. Some of the names of M-Commerce platforms/services in India are mChek, ngpay, PayMate, ITZCash card, Green Money Transfer, ATOM, Obopay, OxiCash etc. From these platforms like m-check, ngpay, ATOM require

Java enabled handsets & GPRS facility to operate m-Commerce, while platform like PayMate does not require these. Most of the M-banking transactions are between the bank accounts of the customers. Some of the platform like 'Green Money transfer' allows person to person transfer through their bank accounts. Bharat Sanchar Nigam Limited (BSNL) has also plans⁴ to launch a mobile banking platform with the help of Department of Post wherein a mobile subscriber will be able to send money orders electronically through SMSs which will be encashable at all post offices in the country.

⁴ Business standard, Delhi 21st Feb,2010

Chapter-5

Issues in M-Commerce

5.1 As mentioned in earlier chapters, the present system of Mobile payment in India is through the banks. The main problem is that a large number of people do not have bank accounts particularly in rural and far-flung areas. It may be due to less accessibility and reach of the banks and due to lack of mass awareness for making people to avail banking services.

5.2 Even in the existing framework of m-payment and M-banking, there are technical, regulatory and legal issues which need to be tackled for enabling the adoption of m-Commerce by the masses. There are financial aspects related to payments and micro payments; security aspects related to payment, information transfer within and beyond the access network; privacy aspects related to data security, email, virus, location based privacy, transaction details privacy; consumer protection related to cost control, information disclosure on tariffs and services, protection of minors, appeal for grievances; and others aspects like taxation policies , e-money policies etc.

5.3 The issues in M-Commerce have been categorized in the following broad categories:-

Regulatory Issues:

5.4 There are many regulatory issues as far as banks, telcos and third party processors are concerned.

Issues for Banks :-

- Anti Money laundering and Know Your Customer(KYC) controls,
- Cash payment and cash handling infrastructure,

- Transaction capability,
- Bank account opening and maintenance,
- Tie-up with merchants etc.

Issues for Telecom companies:-

- Anti Money Laundering laws,
- KYC regulations,
- Acceptance of deposits by Telcos,
- Fraud management / reporting, etc.
- Telco Network for using domestic money remittances,
- Transaction monitoring

Issues for Third party payments processors

- Regulatory controls,
- Application hosting and Network infrastructure,
- Transaction capability and monitoring,
- Centralized cross bank settlement mechanism etc.

Technical Issues:-

Lack of Standards:

5.5 With a host of device operating systems and platforms, middleware solutions and networks, make application development for the wireless Internet a formidable task. While WAP has been a very important in the evolution of the wireless Internet and in turn m-Commerce, there are problems/difficulties with the standard, such as the lack of WAP-enabled devices and security issues. The lack of standards gives rise to lot of local and fragmented versions of m-payments offered by different stakeholders. Standards need to address security and privacy concerns of customers as well as interoperability between various

implementations. Standards formation is a process of negotiation between various stakeholders. There is a need to have consensus among the players in terms of m-payments standards setting.

Device constraints

5.6 There are technical issues related to the mobile devices particularly mobile phones. As compared to e-commerce where computers are themselves quite powerful, the mobile phones suffers from some of the following constrains:-

- Less processing power and memory
- Constraint bandwidth
- Short battery life.
- Frequent disconnections
- Tiny screens, poor resolutions
- Privacy Issues like unauthorised access to stored data, especially personal information and transaction history and Locational information that may target direct advertising and could also encroach on privacy rights of people

Security Issues

5.7 Securing m-Commerce is even more difficult than wired transaction. As mentioned above, the device constraints raise the questions as to whether there will be adequate security for users without compromising the ease of use and speed. There are issues in the m-Commerce technologies discussed in chapter-2 like SMSs are prone to spoofing and there are issues related to SMS encryption. However technology manufacturers are developing improved security for applications with authentication and encryption technologies and many claim that the transaction using mobile device is fully secure. But then there are tradeoffs for increased security, namely price and style.

6 There is also an issue related to protection of the infrastructure supporting m-Commerce from the attacks. Protecting of customer's data and financial transactions and ensuring the integrity of billing mechanisms are also some of the important issues.

Content related issues:-

6.1 M-Commerce, like the Internet, is largely a 'pull' mechanism than 'push', therefore a question as to who would be responsible for the transmission of illegal contents may arise. Other related issues in this category can be copyright, trade mark and patent infringement, data protection compliance issues.

6.2 Due to device constraints it may be difficult for customers to retain messages or content that has been sent to them on their phones for a period long enough to have complaints about the deficiency of service/ transaction.

6.3 Another major issue is the revenue sharing agreements between mobile service providers, banks, content providers, aggregators and other service providers like utilities, travel agencies, hotel industry, retailers etc.

Other Issues:-

Payment settlement related issues can be arised in case of following types of settlement:-

- Card based settlement
- Bilateral settlement between Banks
- Settlement with Multilateral Settlement Agency
- Settlement with Multilateral Settlement Agency acting as Central User Registry

Ability to suspend, cancel or block transaction – consumer’s right to suspend or cancel ongoing transactions like subscriptions to stock quotes. Merchant’s right to suspend transactions, if there is breach.

Inclusion of telecom service providers as Business Correspondence(BCs):- Presently telecom service providers are acting as conduit between customers, mobile application service providers and banks. As per the present RBI Guidelines, banks can make Business Correspondence from the entities including from those Section-25 companies that are stand-alone entities or in which NBFCs, banks, telecom companies and other corporate entities or their holding companies do not have equity holdings in excess of 10%. This clause may have preventive effect in active participation of the telecom companies in promotion of m-Commerce in India.

Chapter-6

Way Forward

6.1 For any service to be successful, the customer acceptance is a necessary pre-condition. Customers look for easy to use, secured, ubiquitous and cost efficient m-Commerce services. Trust in the m-Commerce system is an important factor. The banks, application providers and telecom service providers need to work towards building trust amongst the customers. If the most trusted brands in the business can come together to offer m-Commerce services it will have positive impact. A transaction log, including the offer of sale, order for goods, confirmation and payment authorisation etc, can be created and deposited in an unalterable format at a trusted repository from where it can be retrieved, in event of a dispute. This will help developing trust amongst the users.

6.2 The ecosystem in m-Commerce include the customer acquisition setup, distribution and retailer network, application service providers, technology provider and the banks. Major steps can be taken by banks and the mobile service providers to proactively promote the new payment schemes. The telecom service providers have to fulfill the expectations of customers are to have reliable and ubiquitous connectivity on their mobile phones and banks have to seek an easy and simplified m-Commerce experience.

6.3 To make m-Commerce applications successful steps in the following areas may help:-

- A stable legal environment with availability and enforcement of contract laws will build faith in the system among the various players and foster the industry as a whole.

- Government by putting in place consumer protection laws and grievance redressal mechanism will foster consumer trust and faith in Mobile commerce.
- Mobile Terminal/Device Industry may develop and introduce advance functionalities in the device at affordable costs and compatibility in local languages. Content availability in vernacular/local languages will surely attract non-English speaking users thus increasing the number of m-Commerce users.
- The content production can be promoted through government policies in several ways. Reduced duties on electronic and audio video production equipments will bring down the costs of production. This will bring down the costs of content on mobile raising its demand and ultimately pushing up m-Commerce.
- The other way government can influence Content Industry is by ensuring enforceability of intellectual property rights (IPR) and digital rights management (DRM) laws. Content Piracy is a major problem in media, which brings down the profitability of the industry. A profitable industry would attract more developers and thus make more content available, which will bring in tougher competition resulting in a drop in rates.
- Banks can extend their services through aggregators or can enter into direct agreements with mobile companies to form joint ventures for micro credits and other services. Fair revenue sharing mechanisms. A fair revenue sharing mechanism and a viable & sound business model for all the stakeholders shall make m-Commerce attractive for all players.

- Telecom companies, if included, as Business Correspondence will involve them more actively in promotion of m-Commerce services in India. Though RBI has permitted non-bank entities⁵ including Mobile service providers(MSP) to issue mobile based prepaid instruments, but MSPs have not shown their interest in it.
- A proper grievance handling mechanism will help address the customer problems and will develop trust in them. Customers who believe the process has not worked fairly for them should be able to request clarification, complain, or otherwise seek redress. Claims could be made directly to the Bank rather than through the Agents, and claims should be dealt with through a well-defined process that specifies roles, responsibilities, and expected timelines.
- Security issues as mentioned in the earlier chapter need to be looked. It is also necessary that the infrastructure supporting m-Commerce is protected from the attacks. Technical protection and isolation of internal systems and of the network itself will be necessary in view of the greater exposure through public networks access. The issues of protecting customer's data and financial transactions and to ensure the integrity of billing mechanisms and certifications services must also be addressed. Firewalls, access control, monitoring and detection systems have little values unless they are configured, maintained and operated properly.

6.4 Presently m-Commerce in India is done through the banks only. For financial inclusion of the masses, which does not have bank accounts, it may be necessary that access to basic Banking services be give to the unbanked & rural population of this country by means of an

⁵ http://www.rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=10854

easy to access and an affordable delivery channel i.e. a mobile phone.

6.5 International success of as G-Cash (Globe Telecom) in Philippines and Mpesa (Safaricom) in Kenya proved that mobile phones successfully contributing to financial inclusion to the disadvantaged and weak section of the society which may not have bank account. These services in these countries have clear cut objectives in terms of what they want to offer to the masses.

Conclusion: - It is well recognized that mobile phones have immense potential of conducting financial transactions thus leading the financial growth with lot of convenience and much reduced cost. For inclusive growth, the benefits of m-Commerce should reach to the common man at the remotest locations in the country. For this all stakeholders like Regulators, Govt, MBAS, telecom service providers and mobile device manufactures need to make efforts so that penetration of m-Commerce reaches from high-end to low-end users and from metros to the middle towns and rural areas. Inclusion of non-banking population in financial main stream will benefit all. There is also need to generate awareness about the m-Commerce so that more and more people use it for their benefit.

With the advanced technologies like 3G and BWA expected to come soon, there will be a larger window to innovate service delivery. Performance(QoS) of mobile services with 3G will improve and accessible data plans will be available, it will have positive impact and will result in attracting more customers to the era of new world where cash/paper transaction is replaced by the m-Commerce.

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