

Financial Inclusion Through Mobile Phone Banking: Issues and Challenges

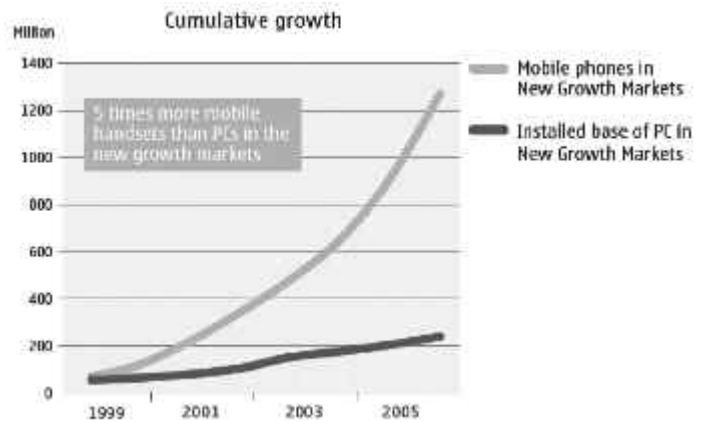


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Introduction

The past two months have seen some pretty exciting times in the world of telecommunications. In August 2007, the world saw its 3 billionth mobile phone connection and in September 2007, India had crossed 200 million mark for its wireless subscribers. Teledensity in India stands at 21.2 per cent which translates to the fact that 1 in every 5 person has a phone. This also implies that 200 million people have their mobile phone close to them almost 24x7 which makes it a very lucrative device to deliver services to a large segment.

On the other hand, PCs have been fairly beaten by the growing mobile phone market, primarily because of the fact that a mobile phone being handy, does not require permanent power and is usable by even people who do not know how to read and write. On top of that, the convergence of technologies has enabled the mobile to render much more.



Strictly from rural India perspective, the mobile penetration has been 4.92 per cent and has been growing very steadily. The following table describes the penetration of services in these rural areas.

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Rural Mobility Numbers			
<i>Top 15 states in terms of rural mobility</i>	<i>Rural mobile connections (million)</i>	<i>Total rural population (million)</i>	<i>Penetration as % of rural population</i>
Punjab	2.240	10.830	20.69
Himachal Pradesh	1.000	5.850	17.09
Kerala	2.660	25.030	10.63
Haryana	1.660	16.270	10.20
Gujarat	3.207	34.420	9.31
Tamil Nadu	2.802	32.860	8.52
Andaman & Nicobar	0.023	0.278	8.27
Rajasthan	3.274	48.660	6.72
Maharashtra	3.790	59.670	6.35
Karnataka	2.250	36.560	6.15
Andhra Pradesh	3.276	59.270	5.52
Jammu & Kashmir	0.430	8.240	5.21
West Bengal	3.010	62.480	4.81
Orissa	1.280	33.060	3.88
Uttar Pradesh	4.608	147.000	3.13
Total (1-15)	35.510	580.478	6.12
All India (total)	39.460	802.000	4.92

Source: TRAI, mobile connections data up to June 2007, All figures rounded off

This rapid growing mobile market has enabled a variety of services for the rural markets. Nokia along with Center for Knowledge Studies conducted a study highlighting following uses of the mobile device : (i) transport (ii) micro commerce (iii) finance (iv) healthcare (v) governance (vi) education and (vii) infotainment. The growing list of usages of this device has made this an important instrument for organizations to connect with the rural masses and bring more and more services. This article shall delve more into the usage of the phone as a financial device.

Mobile Banking

Mobile Banking (or Mobile payment) is a term used for

performing balance checks, account transactions, payments, etc. via a mobile device such as a mobile phone, PDA or other such device. These services are primarily gaining popularity for micro payment scenarios. Mobile banking today (2007) is most often performed via SMS or the Mobile Internet but can also use special programs downloaded to the mobile device.

According to a study by financial consultancy Celent, 35 per cent of online banking households will be using mobile banking by 2010, up from less than 1 per cent today. Upwards of 70 per cent of bank call center volume is projected to come from mobile phones. Mobile banking will eventually allow users to make payments at the physical point of sale. "Mobile contactless payments" will

make up 10 per cent of the contactless market by 2010.

Many believe that mobile users have just started to fully utilize the data capabilities in their mobile phones. In Asian countries like India, China, Indonesia and Philippines, where mobile infrastructure is comparatively better than the fixed-line infrastructure, and in European countries, where mobile phone penetration is very high (at least 80 per cent of consumers use a mobile phone), mobile banking is likely to appeal even more.

This opens up huge markets for financial institutions interested in offering value added services. With mobile technology, banks can offer a wide range of services to their customers such as doing funds transfer while traveling, receiving online updates of stock price or even performing stock trading while being stuck in traffic. According to the German mobile operator Mobilcom, mobile banking will be the "killer application" for the next generation of mobile technology.

Applications

Most of the mobile payment platforms fall into four categories:-

- Mobile Banking: Enabling users to perform banking transactions using mobile phone like, balance checks, fund transfers, bill payments, etc.
- Remote Purchase: Using the mobile phone to purchase goods over the internet or for home delivery. For e.g. paying for a dominos pizza from home
- Person to Person Transfers: Using mobile phones for remittance transfers.
- Point of Sale: Using phones to pay for goods at merchant location

Connectivity

SMS: Most of the popular services are currently based on SMS. These services use the following process flow:

1. Customer sends an SMS initiating payment. As part of the SMS customer enters the pin number, amount and recipient's unique identification number (can be mobile

number of account number)

2. There is a acknowledge cycle for every SMS and transactions can span over multiple SMSs

USSD (Unstructured Supplementary Service Data): Some services have been built utilizing USSD technologies. USSD messages are initiated by dialing short codes. For e.g. *#111#123456#. Process flow followed is similar to above.

GPRS / CDMA: GPRS / CDMA describe services based on mobile internet. These are more advanced services and can allow users with variety of features to conduct transactions. Typical usage scenario is described below:

1. Customer visits a website using his phone and initiative transaction using pin number and phone number as a combination
2. Alternatively the customer can open an application residing on this phone and initiative payment by selecting merchant / product.
3. All data communication is over the internet protocol and following normal e-commerce based practices

Handset Technologies

SIM Toolkit: Using a SIM Toolkit, mobile operators can load m-banking applications into the customer's mobile SIM card.

Mobile Application Development Platforms : These technologies describe various programming languages using which applications can be developed for mobile phones. These applications along with customer's data reside on the mobile phone.

Emerging Technologies

NFC: Near Field Communication (NFC) is a technology which is in its early stages. NFC describes a short range wireless technology which enables communication between devices over a short range. Multiple phone manufactures are currently designing and manufacturing phones with built in NFC circuits. In this case, there is a

Pros and Cons of Various Technologies

	<i>Pros</i>	<i>Cons</i>
Connectivity		
SMS	<ol style="list-style-type: none"> 1. Easier to build applications 2. Already a popular medium to communicate 2. Billing activities can be automated by tight integration with operator's systems 	<ol style="list-style-type: none"> 1. Still unreliable. Delivery of message is not guaranteed. 2. Requires user to remember codes / keywords 3. Data size per message is restricted to 160 characters Multiple SMS based transactions can cause user resistance
GPRS / CDMA	<ol style="list-style-type: none"> 1. Provides ability to build advanced features 2. User interacts with a well designed UI and does not require training 3. Can integrate seamlessly with ecommerce scenarios 4. Development skillset for GPRS are widely available 	<ol style="list-style-type: none"> 1. GPRS/CDMA still not popular 2. GPRS in particular requires separate hardware and is not present wherever GSM connectivity is available. Both in turn do not have a pan India presence 3. CDMA requires specialized skillset which is not widely available
Handset Technologies		
SIM Toolkit	<ol style="list-style-type: none"> 1. Ensure availability of application as and when customer buys a new SIM card 2. Operator is closely associated with the mobile banking project and hence the task of delivery of service is easy 	<ol style="list-style-type: none"> 1. Requires operator's assistance in replacing existing SIM cards 2. Operator lock-in for banks 3. Technology may not be interoperable in multiple operator scenarios
Mobile Application Development	<ol style="list-style-type: none"> 1. Operator independent. 2. Development skillset is widely present for GPRS 3. Ability to design and deliver better features and User Interface 	<ol style="list-style-type: none"> 1. Development skillset is rare for CDMA 2. Data security is a concern
Emerging Technology		
NFC	<ol style="list-style-type: none"> 1. Ease of use 2. Experience similar to credit card usage 	<ol style="list-style-type: none"> 1. Still in nascent stages, various pilots being conducted across the world 2. Mobile phones still costly
Mobile Phone as a device	<ol style="list-style-type: none"> 1. Availability with customer 24x7 2. Always on and always connected 3. More handsets than bank accounts 4. Telecom operators already have sophisticated billing systems and can deliver banking services independent of banks. 	<ol style="list-style-type: none"> 1. Not built for mobile transactions. Compared to POS / ATM devices which are built and certified for banking activities 2. Primarily PIN based authentication, concerns on ability to remember pin numbers. (Efforts are on to integrate biometric scanners with phones)

separate tamper proof memory (separate SIM card) which stores the customer's details. Typical usage scenarios are described below:

1. Customer visits a merchant and swipes his/her phone over a NFC transaction terminal
2. The terminal and the phone interact to debit money from the customer's account
3. The transaction is conducted over the counter and data is transmitted from the POS following standard credit/debit card norms

Business Models

There are broadly three different models being pursued for enabling mobile banking:

1. Bank led models
 - Focus on Banking: The banks are utilizing mobile phones as an alternate channel for users to access their bank accounts. These typically are replicating their online banking services on the mobile phone platform
 - Focus on Transactions: The banks are using mobile phone as an additional channel for the customer to conduct transactions. Most popular applications are to buy goods using the mobile phone and payments are debited from the customer's phone
2. Operator led models
 - Operators are enabling customer to purchase goods through their mobile phone. The payments are either debited from their pre paid cards or charged to the customer in their post paid bills.
 - Usage of talk time as currency: Presently used only in Uganda (Sente), whereby users can transfer talk time to their relatives. The relatives in turn can visit nearby operator's outlets and encash talk time for money.
3. Hybrid models
 - Currently mobile banking is very popular in Japan, South Korea, Philippines and Kenya. All these countries have one thing in common, the largest operator (>60 per

cent market share) has in some form tied up with a large national bank to offer mobile banking services. This kind of a relationship provides sufficient leverage in creation, distribution and maintenance of services.

Services offered through Mobile banking

Account Information: (i) Mini-statements and checking of account history, (ii) Alerts on account activity or passing of set thresholds, (iii) Monitoring of term deposits, (iv) Access to loan statements, (v) Access to card statements, (vi) Mutual funds / equity statements, (vii) Insurance policy management, (viii) Pension plan management, (ix) Status on cheque, stop payment on cheque, etc.

Payments & Transfers: (i) Domestic and international fund transfers, (ii) Micro-payment handling, (iii) Mobile recharging, (iv) Commercial payment processing, (v) Bill payment processing, (vi) Peer to Peer payments, etc.

Investments: (i) Portfolio management services, (ii) Real-time stock quotes, (iii) Personalized alerts and notifications on security prices, (iv) Support, (v) Status of requests for credit, including mortgage approval and insurance coverage, (vi) Cheque book and card requests, (vii) Exchange of data messages and email including complaint submission and tracking, (viii) ATM location, etc.

Content Services: (i) General information such as, weather updates, news, etc. (ii) Loyalty-related offers, (iii) Location-based services, etc.

Based on a survey conducted by Forrester, mobile banking will be attractive mainly to the younger, more "tech-savvy" customer segment. A third of mobile phone users say that they may consider performing some kind of financial transaction through their mobile phone. But most of the users are interested in performing basic transactions such as, querying for account balance and making bill payment.

Issues and Challenges

Key challenge in developing a mobile banking ecosystem

is the lack of standardization. (http://en.wikipedia.org/wiki/Mobile_Banking). Lack of standards for mobile banking and adoption of various technologies have led to isolated projects spread across the globe. For example, imagine a scenario where a Vodafone user is unable to transfer money to an Airtel user or a Hutch user is unable to pay on an Airtel Merchant. There is a strong requirement for standards similar to what VISA and MasterCard have done for the card payment industry. Standardization will bring in:

Interoperability

There is a lack of common technology standards for mobile banking. Many protocols are being used for mobile banking HTML, WAP, SOAP, XML to name a few. It would be a wise idea for the vendor to develop a mobile banking application that can connect multiple banks. It would require either the application to support multiple protocols or use of a common and widely acceptable set of protocols for data exchange. There are a large number of different mobile phone devices and it is a big challenge for banks to offer mobile banking solution on any type of device. Some of these devices support J2ME and others support WAP browser or only SMS.

Overcoming interoperability issues, however, have been localized, with countries like India using portals like R-World to enable the limitations of low end java based phones, whereas, South Africa have defaulted to the USSD as a basis of communication achievable with any phone. The desire for interoperability is largely dependent on the banks themselves, where java enabled applications are of better security, easier to use and offer development of more complex transactions similar to that of internet banking while SMS can provide the basics but becomes a hassle to operate with more difficult transactions.

Security

Security of financial transaction being executed from some remote location and transmission of financial information over the air, are the most complicated challenges that need to be addressed jointly by mobile

application developers, wireless network service providers and the bank's IT department.

The following aspects need to be addressed to offer a secure infrastructure for financial transaction over wireless network :

1. Physical security of the hand-held device. If the bank is offering smart-card based security, the physical security of the device is more important.
2. Security of the thick-client application running on the device. In case the device is stolen, the hacker should require ID/Password to access the application.
3. Authentication of the device with service provider before initiating a transaction. This would ensure that unauthorized devices are not connected to perform financial transactions.
4. User ID / password authentication of bank's customer.
5. Encryption of the data being transmitted over the air.
6. Encryption of the data that will be stored in device for later / off-line analysis by the customer.

Scalability & Reliability

Another challenge for the banks is to scale up the mobile banking infrastructure to handle exponential growth of the customer base. With mobile banking, the customer may be sitting in any part of the world (a true anytime, anywhere banking) and hence banks need to ensure that the systems are up and running in a true 24 x 7 fashion. As customers will find mobile banking more and more useful, their expectations from the solution will increase. Banks unable to meet the performance and reliability expectations may lose customer confidence.

Application distribution

Due to the nature of the connectivity between bank and its customers, it would be impractical to expect customers to regularly visit banks or connect to a web site for regular upgrade of their mobile banking application. It will be expected that the mobile application itself check the upgrades and updates and download necessary

patches. However, there could be many issues to implement this approach such as upgrade / synchronization of other dependent components.

Personalization

It would be expected from the mobile application to support personalization such as, preferred language, date / time format, amount format, default transactions, standard beneficiary list, alerts, etc.

Mobile Banking in Indian Context

Mobile banking has been gaining momentum in India where

- Banks are offering balance checks on mobile phones
- Pilots are being held as to how payments and transfers can be initiated through mobile phones.

But India's ecosystem has some typical features that can hamper the growth of mobile banking, namely:

- Reserve Bank of India is not open to issuance of e-money from operators
- Mobile sector is very fragmented with no clear leader
- With almost 41 per cent of unbanked population, it is safe to say that there is no clear leader in the banking sector as well.
- No clear guidelines / policies on mobile banking can lead to issues around interoperability

A mobile banking ecosystem can be successfully built if various entities (Banks, Operators, Service Providers, Phone manufacturers) can be brought together to a common forum and evolve a set of standards and guidelines for enabling mobile banking in India.

FINO and Mobile Banking

Financial Information Network & Operations (FINO) was founded with a vision to build the next generation of financial services delivery platform for delivery of services at lower transactional costs to the under-banked and unbanked segment. FINO has developed this platform with a smart card and POS terminal based front end. Alongside we have started to look at variety of other front end systems including mobile phones, ATMs and other devices. We are looking at mobile phones specifically in the following areas:

- Mobile phones as transaction devices whereby agents equipped with mobile phones can enable collection of loan repayments, premium collection, etc.
- Mobile phones as payment devices whereby users can use the mobile phone to pay for various activities and conduct normal banking transactions. For the same, we are looking at the following technologies
 - SMS / GPRS / CDMA based payment processing mechanisms
 - Near Field Communication based systems
 - Possibility of biometric scanners integrated with mobile phones to enable fingerprint authentication.