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M-BANKING IN INDIA: A STRATEGIC ANALYSIS OF ISSUES AND CHALLENGES

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ABSTRACT

Technology has, for better or worse, undeniably brought about a change, hitherto unimagined, in our life styles. The transformation brought about by technology in the area of delivery of financial services has, thankfully, only been for the better. Internet Banking complemented by core banking solutions implemented by banks, mobile banking, card based electronic transactions at any bank ATM and merchants locations (both physical and through e-commerce sites) have offered a variety of channels to bank customers to conduct their payment transactions. During the last one decade, things have changed and changed at a rapid pace and all because of technology. The initial steps of tapping technology came in the form of adoption of the Core Banking Systems (CBS) which led to near collapse of geographical location of parent branch. Most of the customers would be tapping the technology led internet banking and interconnected ATM network. The desktop PCs became our anytime bank branches. Then came the next revolution – mobile banking which added anywhere to the truly anytime banking. Weaning the customer from physical banking and building customer awareness and confidence in these non face-to-face modes of banking has been a herculean task for the banking industry. In this exciting and challenging journey, the Reserve Bank, as a pro-active regulator, has defined enabling policies and, at times, has goaded the industry in achieving the desired results. The Governments, both at the central and the state levels, have also been taking measures in encouraging electronic payments and receipts, such as, electronic benefit transfers and e-mode of transactions for their receipts and payments. This paper highlights the payment system industry to introspect the conceptual view, issues and challenges in confronting customization of mobile banking in India with all the stakeholders.

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INTRODUCTION

The technology adoption has changed the face of banking in India. What started as a mere automation of some routine work processes in banks in the mid 80's has moved on and resulted in business process re-engineering culminating in making banking services branchless, anytime and anywhere, facilitated new product development and enabled near real time service delivery. Technology helped banks to reach the doorsteps of the customer by overcoming the limitations on geographical/physical reach in branch banking and easing the resource and volume constraints posed by the brick and mortar model. For the banks the question is no longer limited to whether mobile banking will be an important part of their business but how best to approach a rapidly evolving channel to deliver better customer service, expand product range, retain market-share,

enhance revenue, drastically reduce operating expenses and above all remain socially relevant without sacrificing sustainability in ICT based financial inclusion plans. Mobile banking has come to occupy an important place in banking in a very short time and is expected to provide much needed platform for taking banking to the unbanked masses. Mobile banking certainly seems to be one of the biggest innovations along with CBS and ATMs in the field of banking and this will have a long lasting effect on how banking business is conducted. CBS and ATMs provided banks the much needed technological fillip to break the shackles of branch banking architecture. CBS and ATMs have enabled banks to provide banking services 24x7x365 but have not really helped in expanding their reach to the unbanked or reach to the customer wherever s/he is. One tends to concur with the view of many academicians and practitioners that this limitation can be overcome to a large extent by leveraging the mobile phone enabled banking or mobile banking. We must see it as the giant leap of the banking industry – leveraging technology to

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promote anytime and anywhere banking and more deeper and sustainable financial inclusion.

Mobile banking

Mobile banking is a system that allows customers of a financial institution to conduct a number of financial transactions through a mobile device such as a mobile phone or personal digital assistant. Mobile Banking refers to provision and avancement of banking- and financial services with the help of mobile telecommunication devices. The scope of offered services may include facilities to conduct bank and stock market transactions, to administer accounts and to access customised information. Mobile banking has until recently (2010) most often been performed via SMS or the mobile web. Apple's initial success with iPhone and the rapid growth of phones based on Google's Android (operating system) have led to increasing use of special client programs, called apps, downloaded to the mobile device. With that said, advancements in web technologies such as HTML5, CSS3 and JavaScript have seen more banks launching mobile web based services to complement native applications. A recent study (May 2012) by Mapa Research suggests that over a third of banks have mobile device detection upon visiting the banks' main website. A number of things can happen on mobile detection such as redirecting to an app store, redirection to a mobile banking specific website or providing a menu of mobile banking options for the user to choose from.

Mobile as a Medium

In this context, the question that often gets debated is: how and why is a mobile device the most appropriate delivery channel of financial services? Besides the technology capability to transmit financial information in an efficient, secure and cost-effective manner enabled by development of mobile based applications for banking, the most significant fact about this idea is the ubiquity of the mobile phones. The number of mobile phones in the country are said to be nearing a billion phones. Hence, banking and financial services, which have already come a long way from the branch level services to the customer's home desktop and laptop, can now be reached to a much larger section of the society, including the financially excluded, through the medium of the mobile phones. Besides the reach of mobile, there is another reason why mobiles are the most appropriate medium. What is after all a banking transaction? What purpose does the traditional cheque serve? In India, if you forget to carry your cheque book for withdrawal of funds, they provide you with what is called a withdrawal slip. A cheque or a withdrawal slip is a personalized direction to your banker to put through banking transactions on your behalf. The authentication is achieved through your signature. But this traditional method is expensive. A mobile phone achieves the same purpose and enables you to send personalized secure instructions to your banker to undertake transactions on your behalf. If your bank has achieved seamless integration with the CBS, then the transaction gets automatically registered. But these transactions using mobile are far less expensive than its traditional alternatives. More importantly, you hold the key since mobile is in your pocket and you need not depend on bank timings or the rush there to undertake banking transactions. This is perhaps the most important advantage of the mobile over other alternate payment methods. The mobile

phone can, therefore, empower the common man to conduct his payment transactions any time and from anywhere. It is, therefore, no wonder that mobile payments and mobile banking are being hotly debated in various forums, in India and abroad.

Origin and potential of mobile banking in India

Recognizing the potential of mobile banking, Reserve Bank of India issued the first set of guidelines in October 2008. The guidelines defined mobile banking as undertaking banking transactions using mobile phones by bank customers that would involve credit/debits to their accounts. This definition in a sense provided larger canvas to mobile payments which in a narrow sense involved only payment made for a product or service using the mobile phone either remotely or at the Point Of Sale (POS). These guidelines, which were very broad-based, laid down the technology and security standards pertaining to safety, confidentiality, integrity, authenticity and non-reputability. As this was a nascent technology and, to build up customer confidence in terms of minimizing frauds, the Reserve Bank mandated that all transactions should be encrypted irrespective of the value. The Reserve Bank also made inter-operability a cornerstone of its policy. After the initial set of guidelines, several policy relaxations have been made to further encourage the use of mobile banking taking into account changing economic environment and feedback of the industry and customers (Box 1). The growth in mobile banking that has taken place in the country till date, though has been rapid, is yet to reach the critical mass that will enable it to deliver on its promise of reaching banking including payment services at a cheaper, secure and seamless manner to the existing and potential customers. It has the potential to be the next wave of financial and technological innovation in banking by universalizing access to banking service without jeopardizing prudential and regulatory framework of the financial sector.

Need for Mobile Banking

"The account that travels with you". This is needed in today's fast business environment with unending deadlines for fulfillment and loads of appointments to meet and meetings to attend. With mobile banking facilities, one can bank from anywhere, at anytime and in any condition or anyhow. The system is either through SMS or through WAP. (Check out for SMS Banking under different head). Mobile Banking is the hottest area of development in the banking sector and is expected to replace the credit/debit card system in future. In past two years, mobile banking users have increased three times if we compare the use of either debit card or credit card. Moreover 85-90% mobile users do not own credit cards. Mobile banking uses the same infrastructure like the ATM solution. But it is extremely easy and inexpensive to implement. It reduces the cost of operation for bankers in comparison to the use of ATMs. Using compact HTML and WAP technologies, the following operations can be conducted through advanced mobile phones which can be further viewed on channels such as the Internet via the Channel Manager.

- Bill payments
- Fund transfers
- Check balances
- Any many more which is also available in SMS Banking

These are the factors which paved way for mobile banking.

- For Financial inclusion. Almost 60% of the population does not have a bank account.
- Take banking to the masses - there are only 90,000 bank branches in India and covering the whole population with physical bank branches will take more than 20 years.
- Mobile banking costs make for a compelling business case - according to Citibank the bank branch is 10 times more expensive than doing a transaction on a mobile phone.
- Large part of the population has a mobile phone, but no bank account - making the case of using mobile phones for financial services (like payments) compelling.
- Leveraging the mobility of mobile phones for anywhere banking

Any technology that is well-accepted and widely available at affordable costs and suitable for banking and payment services provides an immense opportunity to extend these services to all areas and all sections of the society – banked and unbanked. Mobile technology scores on all these parameters and can act as a catalyst to usher in the universal goal of financial inclusion shared by all the stakeholders. In a large country like ours where a majority of population still lives in rural areas that do not have presence of formal banking providing banking facility has been a major challenge. Of the 0.6 million villages in India, the total number of villages with banking services through brick and mortar branches and alternate banking channels stands at approximately 0.14 million villages as at end March 2012. India has the highest number of households (approximately 145 million) who are excluded from banking. However, with the growing reach of the mobile in hinterland, it has now become possible to provide the banking facilities to people who were not able to enjoy this facility so far. At the end of January 2012, the total wireless subscriber base was 936 million out of which, 313 million subscribers were from rural areas. Use of mobile banking services among this huge base of subscribers is, however, very low.

Even amongst the existing bank customers less than one percent of them are covered under the mobile banking services. Notwithstanding the existing low base of customers, the growth in mobile banking transactions has shown increasing trend. For example, in the month of June 2012, 3.43 million transactions amounting to `3067.10 million were processed as compared to 1.41 million transactions amounting to `984.66 million processed in June 2011 - an increase of about 143 per cent in volume and approximately 211 per cent in value terms. It is, however, evident that the potential of mobile banking technology is yet to be fully exploited. Another potential factor that has attracted all the stakeholders including policy-makers to this innovative technology is the lower cost associated with this model in providing banking services both amongst existing customers and in taking banking to the hinterland as well. According to a study, mobile banking based transaction costs about two per cent of the branch banking cost, 10 per cent of the ATM based transaction cost and 50 per cent of the internet banking cost. The main reason for non-availability of banking to a large part of our population is the limited economic viability of the brick and mortar model of branch banking. Even ATMs and internet banking have their limitations when it comes to penetration in

rural areas. Notwithstanding this, the Reserve Bank, given its constant endeavour to link every citizen of the country with the formal financial system, is keen to expand mobile banking penetration. With the availability of the mobile with almost every household, it has now become possible to make the giant leap to a reality by providing everybody with banking services including payment services. The potential of mobile banking is also underscored by the fact that the consumers are conveniently placed in terms of using the product anytime anywhere and could develop ease of using the product once they are made aware of the same.

Customized mobile banking products in India

The generic definition of mobile banking involving credit/debit to the account of the customer using mobile has been customized in India to provide two rather unique services. These are the Inter-bank Mobile Payment System (IMPS) and the Mobile linked Kisan Credit Card (m-KCC).

IMPS - mobile based remittance system

The IMPS is a mobile based remittance system which is inter-bank in nature and is owned and operated by the National Payment Corporation of India (NPCI). The IMPS facilitates access to banks accounts and transfer of funds through mobile phones. The system, launched in November 2010, provides real time transfer of funds between the customers of different banks on 24x7 basis. In other words, funds can be transferred any time to the beneficiary who receives the funds instantaneously and both the sender and receiver get the confirmation of debit and credit. 50 banks have started providing IMPS services to their customers so far and as at the end of July 2012, banks have issued 36.32 million Mobile Money Identifiers (MMIDs) to their customers.

Mobile linked Kisan Credit Card (m-KCC)

Mobile linked Kisan Credit Card (m-KCC) launched by NABARD on a pilot basis on October 2, 2011 in Villupuram district of Tamil Nadu for the farmers having KCC accounts with the Pallavan Grama Bank (an RRB sponsored by the Indian Bank). The m-KCC using mobile technology enables farmers to carry out purchase of agricultural inputs in a cashless manner. All transactions are carried out through mobile phones of farmers and vendors registered with the bank and the Technical Service Provider (TSP). The transaction is performed through a combination of a secured SIM card and a PIN using an interactive voice recording/SMS system. This enables the farmers to buy agriculture inputs by putting through the transactions through a mobile phone enabled system linked to the banks CBS. NABARD is now encouraging banks, in particular the RRBs, to use this pilot for extending mobile based KCCs to the farmers.

Mobile banking services

Typical mobile banking services are outlined in Table 1.

Current issues in the mobile banking landscape

Why a bank led model?

Mobile as a technology, which is low-cost, ubiquitous and efficient with a potential to enable achievement the goal of deeper financial inclusion, has been recognized across the

Table 1. Mobile Banking Services

Services	
<i>Account information</i>	<ol style="list-style-type: none"> 1. Mini-statements and checking of account history 2. Alerts on account activity or passing of set thresholds 3. Monitoring of term deposits 4. Access to loan statements 5. Access to card statements 6. Mutual funds / equity statements 7. Insurance policy management
<i>Payments, deposits, withdrawals, and transfers</i>	<ol style="list-style-type: none"> 1. Cash-in, cash-out transactions on an ATM 2. Domestic and international fund transfers 3. Micro-payment handling 4. Mobile & Direct to Home package recharging 5. Purchasing tickets for travel and entertainment 6. Commercial payment processing 7. Bill payment processing 8. Peer to Peer payments (e.g., Popmoney, Isis) 9. Withdrawal at banking agent 10. Deposit at banking agent
<i>Investments</i>	<ol style="list-style-type: none"> 1. Real-time stock quotes 2. Personalized alerts and notifications on security prices
<i>Support</i>	<ol style="list-style-type: none"> 1. Check (cheque) book and card requests 2. Exchange of data messages and email, including complaint submission and tracking 3. ATM Location
<i>Content services</i>	<ol style="list-style-type: none"> 1. General information such as weather updates, news 2. Loyalty-related offers 3. Location-based services
<i>Future functionalities in mobile banking</i>	<ol style="list-style-type: none"> 1. Communication enrichment: - Video Interaction with agents, advisors. 2. Pervasive Transactions capabilities: - Comprehensive "Mobile wallet" 3. Customer Education: - "Test drive" for demos of banking services 4. Connect with new customer segment: - Connect with Gen Y – Gen Z using games and social network ambushed to surrogate bank's offerings 5. Content monetization: - Micro level revenue themes such as music, e-book download 6. Vertical positioning: - Positioning offerings over mobile banking specific industries 7. Horizontal positioning: - Positioning offerings over mobile banking across all the industries 8. Personalization of corporate banking services: - Personalization experience for multiple roles and hierarchies in corporate banking as against the vanilla based segment based enhancements in the current context. 9. Build Brand: - Built the bank's brand while enhancing the "Mobile real estate".

world. Different countries are following different mobile banking models depending upon their requirements and availability of infrastructure. In our larger vision of financial inclusion, provision of payment services is one amongst the four services that we have clubbed under financial inclusion viz., a deposit product, a credit product, a micro-insurance product and a remittance product. Accordingly, the Reserve Bank of India has consciously adopted the bank-led mobile banking model. The bank led model has also been endorsed by the Inter-Ministerial Group of the Government of India constituted in November, 2009. There are, however, counter-views within the country and internationally as well suggesting that the non-bank led mobile banking model that have been found to be very successful elsewhere should be tried out here. It is often not appreciated when citing these success stories that only one service, i.e., a remittance product, is being offered and not the complete bouquet of financial services envisaged by us. The other three products identified under financial inclusion can obviously not be offered by a non-bank. Moreover, particular environments in a few countries enabled the non-bank led model to be successful viz. presence of a monopoly operator, very poor banking infrastructure and availability of a national identification number. Is it not surprising that the same success story has not been repeated by the same service operator in a neighbouring country?

Bank-led vs Non-bank led model of mobile banking

Protagonists of the non-bank led model referred to the success of such models in a few countries like Kenya and Philippines. While acknowledging that the mobile banking models in these countries were perhaps the appropriate solution in the respective jurisdictions, we, in India, came to the conclusion that absence of a bank presence in large parts of the country cannot be solved by non-bank players alone. Having said that, after a careful evaluation of the existing banking infrastructure in place, it is our own perception of the scope of financial inclusion and the relative merits and demerits associated with the two models that India opted for the Bank-led model. It is perhaps this model which has the capability to deliver the minimum of four basic products and services, viz. a savings account with overdraft facility, a remittance product, a pure savings product, preferably, variable recurring deposit, and an entrepreneurial credit product which in our perception are minimum qualifying products that any financial inclusion model should contain. Further, the bank led model provides regulatory comfort as the banks have been in the business of banking including money transfer; systems to adhere to KYC/AML norms and customer grievance redressal are in place and are under the direct regulation and supervision by the Reserve Bank of India. At the same time, we did recognize the important role which the Mobile Service Providers (MSPs)

could and should play in this payment space given their vast agent network across the country touching the remotest areas where banks did not have a physical presence. It's, therefore, enabled these MSPs to be appointed by banks as their Business Correspondents of banks to foster a healthy partnership between the two which could gainfully utilize the expertise of banks and the reach of the MSPs. The new partnerships are beginning to happen and the full impact of this liberalisation is unfolding still.

Bank-led Technology-Neutral Approach

The Reserve Bank recognized the potential of the mobile phone as a channel to conduct financial services quite some time back and the first set of guidelines were taken way back in October, 2008. But the Reserve Bank consciously opted for a bank-led model although our approach remains technology neutral. Mobile phones as a delivery channel have a great potential if the security and cost aspects are addressed for it has to serve a large number of transactions that are small in size. It has to be remembered that use of mobile for banking in financial inclusion cannot become a viable proposition on a standalone basis if the purpose is to achieve meaningful financial inclusion. To make it viable and attract volumes, it has to be provided as a package along with other products and services. This can be achieved only by entities that can provide add-on services like emergency and entrepreneurial credit, saving facilities, other products and services such as insurance, besides remittances. This is where a mainstream regulated entity like a bank fits in. True, some of these alternatives are being provided by a few NBFCs but their scale and reach are not comparable with banks. They can serve niche markets but are not viable in the long run. But, they indeed will facilitate financial inclusion. So, the Indian model will remain a bank-led model with banks partnering MSPs (mobile service providers) and other entities to achieve the national goal of inclusive growth. In our endeavour to enable enhancements in mobile banking both in terms of the nature of services offered and the value of transactions to be permitted under mobile banking, we have been in constant dialogue with the stakeholders and intervened to liberalise the mobile banking guidelines in a phased manner

Cross border remittance through mobile banking

An issue that has been often raised is that if mobile banking has the potential of reaching anywhere, why cross-border remittance through mobile banking is not permitted liberally or why it is not taking off? One of the regulatory challenges in encouraging inward remittance from abroad is to maintain a balance between regulatory-compliant flow of funds (for example, whether they are bona-fide current/capital account flows) and ease of transfer of funds to the beneficiary. Given the higher level of anonymity in cross-border transactions, concerns on the associated AML/CFT related risks and the fact, as has been acknowledged in a World Bank report, that with a very few exceptions, supervision of m-money has really not been implemented effectively, Reserve Bank has allowed only banks and authorized entities to undertake such cross-border transactions. To obviate any operational difficulty in remitting and receiving funds, bank account-to-bank account cross-border remittance has been permitted under the Money Transfer Service Scheme (MTSS). Realizing the need for facilitating hassle-free withdrawal of funds at the beneficiary

end, Reserve Bank has also permitted transfer of funds to the beneficiary's account or to a pre-paid instrument (PPI) issued by banks which could be m-wallet also. The underlying rationale is to ensure flow of cross border funds through the banking channel only irrespective of the media, (which could also be mobile sets) opted for undertaking the transactions.

Customer ownership and grievance redressal

The most often faced problem in mobile banking is as to who owns the customer – the Mobile Network Operator (MNO) or the bank? Whom shall the customer contact in case of any service related grievance? Who is required to resolve the issue? Since India has accepted the bank-led mobile banking model, the customers of the banks get full protection for effecting transactions through this delivery channel as in the case of any other banking transaction. Reserve Bank lays particular emphasis on its continuing pursuit of customer satisfaction and protection and timely resolution of complaints. Accordingly, the customers using mobile banking have recourse to the Banking Ombudsman's customer complaint redressal machinery.

Role of MNOs as Technology Service Provider (TSP)

The Reserve Bank recognises the role of another important stakeholder - the Mobile Network Operator (MNO) in the process of encouraging mobile banking in India. Reserve Bank has advocated a collaborative and co-operative model between the banks and the MNOs. The MNOs are expected to play the role of a technology service provider while banks are expected to provide banking services. With these clear role definitions, both the stakeholders should work together to take banking through the medium of the mobile to the masses. The customer vetting including compliance with KYC norms, customer protection, etc. should remain within the domain of the banking sector. It is heartening to note that this unique approach is taking roots with a couple of successful collaborations between banks and MNOs. While there may be some headwinds in taking this experiment forward, it should be recognised that these are not serious in nature and can be overcome. Issues related to customer ownership, revenue sharing and other such related matters which, it can be resolved through meaningful dialogue in the mutual interest of banks and the MNOs, particularly when both of them need to explore additional source of revenue as they face severe margin pressures.

Role of MNOs as TSP-cum-BC

The 'for-profit' companies can now be engaged as BCs by banks. This provides another avenue to the MNOs for tapping their reach in taking banking to the masses. MNOs are particularly well placed to make use of this opportunity to become the BCs of banks keeping in view the fact that mobile phones have become ubiquitous. A few MNOs have indeed become BCs of some banks and that the nascent strides being taken in this regard are likely to fructify into major achievements soon. Such collaborations between the banks and the MNOs enables each of them to exclusively perform their respective designated roles – as bankers and service providers. Reserve Bank expects that these experiments get up scaled and across the spectrum and result in a win-win partnership for both the parties, leveraging their respective capabilities and reach.

Tapping USSD to expand access to mobile banking services

The Unstructured Supplementary Service Data (USSD) platform offers a common gateway to customers of all banks to easily access and use mobile banking services. The major advantage of USSD is that the IMPS could become accessible even through low-end hand-sets. If USSD enabled mobile remittance system offers such a potential what is holding up this unique product from taking-off? This is of particular relevance for the IMPS system of NPCI. MNOs have expressed concerns on revenue sharing and are keen on negotiating the rates with individual banks rather than provide the same through NPCI. While these concerns may be justified, the payments play in India is a volume game and all stakeholders including the MNOs need to dovetail the same in their business plans. If the common USSD platform is offered by all MNOs, the same is expected to lead to an exponential growth of transactions in the IMPS. Simultaneously, the IMPS platform for person-to-business (P2B) transactions (i.e. in the merchant transactions) has now been enabled. Along with it, Person-to-Person (P2P) remittances can now be made to beneficiaries based on their bank account number or Aadhaar number which is mapped to the mobile number of the beneficiary. The requirement of MMID at the beneficiary end, therefore, becomes optional. Further, the non-bank entities like the Pre-Paid Instruments (PPI) issuers have been permitted to join the IMPS network through a sponsor bank for facilitating domestic money transfers. All these measures should lead to an increase in transactions and should significantly contribute to the revenue streams of the MNOs also. With this enabling technology within reach of the stakeholders, they need to work together in a co-operative and collaborative manner to promote and popularize this unique product.

Permitting cash-out in mobile wallets

The mobile wallet is a Pre-Paid Instrument (PPI) issued in electronic form which resides on the mobile phone. Seeing the potential of PPIs including mobile wallets, Reserve Bank of India has laid down an enabling regulatory framework for such instruments. Simply put, the mobile wallets being issued in India are e-money products and can be used for purchase of goods & services. Mobile wallets can also be used for funds transfers where the holder has been subjected to a fully compliant KYC. The only difference in mobile wallets issued by non-banks in India and other countries is that cash-out is not permitted in India as it is akin to acceptance of demand deposit. The rationale behind the decision is based on the fact that non-banks are not permitted to accept deposits for maturity less than one year. While this being so, the mobile wallet has a great potential to grow as it can be used for payments of goods & services without the customers having to carry any additional card. Ten entities have been authorized to issue mobile wallets; of them, one is a subsidiary of a leading telecom player. Several others are in the pipeline with three to four of them being leading telecom players.

Security and acceptability issues

Any system has to have certain minimum features to attract customers and keep them engaged in the long run; such features are: ease of use, safety and security, accessibility and affordability. Mobile banking meets all these requirements but

still the usage is nowhere near its potential. In the case of mobile banking, which is a novel product, the customer needs to be assured that it would provide her with the same kind of comfort levels that any other payment mechanism currently makes available. Comfort can be derived by the customers when they are able to put through transactions with ease with a zero-fail rate and not have any concerns regarding security issues. Customers should also be made aware as to whom they should approach in case of a failed transaction and how speedily their grievances are redressed. This is where a lot of work needs to be done to make the public aware of customer friendly as also safety features of mobile banking and engage the customers for a long term relationship. The Institute for Development & Research in Banking Technology (IDRBT), established by the Reserve Bank of India launched the Mobile Banking Security Lab (MBSL). The Lab aims at exploring and providing solutions to the much needed safety, security, reliability and inter-operability, for both on low end and high-end mobile sets. The Lab will also provide the benefit of a common technical centre for all banks and financial institutions. The testing platform of the Lab would help the banks to test their security applications in mobile banking. The Lab will also help in providing education services on security related matters in all Indian language enabling awareness creation amongst the users.

Quality of service – issue of sustainable excellence

TRAI has come out with the “Mobile Banking (Quality of Service) Regulations 2012” (Box 2) specifying the standards for MNOs while facilitating mobile banking which will go a long way in further improving the mobile banking services in the country. The MNOs should strive towards meeting these service standards to the banks to enable the customers to enjoy customer friendly banking services.

Engaged employees

Role of employees in driving any business to reach a critical mass is the most important but the least understood issue. The role of BCs or agents, who are being deployed by banks to expand their reach, is, equally important as they represent the banks to the common man and are going to lay down the foundation of bank-customer relationship. It is being assumed that technology will take care of every aspect of banking as most of the processes are being automated. While this is true to a certain extent, it is the combination of frontline human-resources and front-end of technology which acts as the catalyst for service delivery in a nation like India. Employees are expected to help customers to move from being ‘assisted’ initially to becoming ‘self-reliant’ in use of banking related technologies including mobile banking. For the employees to hand-hold the customers, they themselves should be fully conversant with the product. Thus, for mobile banking to grow, the employees would have to strive towards improving customer service, enhancing customer satisfaction and removing any apprehensions regarding the safety and security of mobile banking transactions.

Challenges for a mobile banking solution

Key challenges in developing a sophisticated mobile banking application are:

Handset operability

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 Java ME and others support SIM Application Toolkit, a WAP browser, or only SMS. Initial 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, while focus on areas such as 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 installed applications (Java based or native) provide better security, are easier to use and allow development of more complex capabilities similar to those of internet banking while SMS can provide the basics but becomes difficult to operate with more complex transactions. There is a myth that there is a challenge of interoperability between mobile banking applications due to perceived lack of common technology standards for mobile banking. In practice it is too early in the service lifecycle for interoperability to be addressed within an individual country, as very few countries have more than one mobile banking service provider. In practice, banking interfaces are well defined and money movements between banks follow the ISO-8583 standard. As mobile banking matures, money movements between service providers will naturally adopt the same standards as in the banking world. On January 2009, Mobile Marketing Association (MMA) Banking Sub-Committee, chaired by Cell Trust and VeriSign Inc., published the Mobile Banking Overview for financial institutions in which it discussed the advantages and disadvantages of Mobile Channel Platforms such as Short Message Services (SMS), Mobile Web, Mobile Client Applications, SMS with Mobile Web and Secure SMS.

Security

Security of financial transactions, 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 banks' IT departments. The following aspects need to be addressed to offer a secure infrastructure for financial transaction over wireless network:

1. Physical part 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 any thick-client application running on the device. In case the device is stolen, the hacker should require at least an 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.

One-Time Password (OTPs) are the latest tool used by financial and banking service providers in the fight against cyber fraud. Instead of relying on traditional memorized

passwords, OTPs are requested by consumers each time they want to perform transactions using the online or mobile banking interface. When the request is received the password is sent to the consumer's phone via SMS. The password is expired once it has been used or once its scheduled life-cycle has expired. Because of the concerns made explicit above, it is extremely important that SMS gateway providers can provide a decent quality of service for banks and financial institutions in regards to SMS services. Therefore, the provision of Service Level Agreements (SLAs) is a requirement for this industry; it is necessary to give the bank customer delivery guarantees of all messages, as well as measurements on the speed of delivery, throughput, etc. SLAs give the service parameters in which a messaging solution is guaranteed to perform.

Scalability and reliability

Another challenge for the CIOs and CTOs of 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 (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. There are systems such as Mobile Transaction Platform which allow quick and secure mobile enabling of various banking services. Recently in India there has been a phenomenal growth in the use of Mobile Banking applications, with leading banks adopting Mobile Transaction Platform and the Central Bank publishing guidelines for mobile banking operations.

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 (so called "Over The Air" updates). 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.

Customer focused 7 A framework

Having briefly discussed upon the various issues related to mobile banking, keeping in view the focus on customers/end-users, intend to provide a 7A framework for its evaluation using a framework comprising seven parameters - Availability, Accessibility, Acceptability, Affordability, Awareness, Assurance and Appropriateness.

- Availability implies the availability of technology solutions and wide range of products offering mobile banking services to the customers.

- Accessibility of technology is its spread across both rural and urban India irrespective of the mobile handset being used.
- Acceptability of the product is dependent on making it available in the local language with easy-to-use operational menu.
- Affordability is another benchmark which should guide the product offering as being value for money in providing cost effective and quality services.
- Creating Awareness about the availability of the product through financial literacy campaigns to increase the volumes in mobile banking business and generate necessary network effects.
- Assurance is an aspect which is related to trust in the products and processes and the security and authenticity relating to the transactions.
- Appropriateness is combined effect of all the above features. The mobile banking as a product and as a process scores well on all the above parameters and is, therefore, very appropriate for providing cost effective, easy to use product by both existing and prospective customers.

Accordingly, an appropriate business model taking into account all the above aspects should form part of the corporate plan of the banks as well as the MNOs. Thus, using the 7A framework, the stakeholders can provide mobile banking services which, as we have discussed, suits the needs of the customers leading to its widespread adoption and usage.

Regulatory initiatives taken to promote mobile banking

The first measure to regulate mobile banking in India were taken in October, 2008. Since then, we have progressively liberalized the manner and extent to which banks can conduct mobile banking; alive to the needs of the market, in particular, the unbanked population and the migrant labour force within the country. Today, banks in India are permitted to facilitate funds transfer between bank accounts through a mobile phone. To enable such transfers in a cost-effective manner particularly for the small ticket transactions, we have waived the need for end-to-end encryption for transactions of value up to Rs. 5000 (around USD100). We have also enabled money transfers from a bank account with cash pay-out to the receiver at an ATM or a Business Correspondent with a cap on the transaction value. To enhance the efficiency of the mobile banking system, we had approved a unique initiative, the Inter Bank Mobile Payment System (IMPS) which provides a centralized interoperable infrastructure and enables money transfers between customer accounts in different banks through mobile phones in real time. This service rides on the existing National Financial Switch (NFS) Interbank ATM transaction switching infrastructure and message format – and hence easy for banks to adopt.

Current Status of Mobile Banking in India

Presently, 65 banks have been approved for conduct of mobile banking out of which 47 banks have commenced offering these services. Transactions in mobile banking have been showing an uptrend. During February 2012, more than 2.8 million transactions for close to `1961.23 million were transacted; a 300 % increase in volume and more than 200% in value terms as compared to 0.7 million transactions for close to `616.19 million during February 2011. Banks are given one

time approval to commence mobile banking based on criteria set by RBI. 52 banks have been approved to commence mobile banking services. The volume of mobile banking transactions in July 2011 was 1.74 million with a value of Rs.1.51 billion, an increase of 223% over the position in July 2010. A little over 12.23 million bank customers have so far registered for mobile banking services. These numbers are not really heartening if we consider the following facts:

- At the end of January 2012, the total wireless subscriber base was 936 million, which included 313 million subscriptions in the rural areas.
- Only 55% of the people of India have deposit accounts.

It is evident that mobile phones have reached more households than basic banking services. Banks have not really made a significant penetration even among their existing customers to extend mobile banking services. However, for me, the most important concern is that there is a significant percentage of financially excluded population and the potential of the mobile phone to extend them financial services is still to be tapped. Reserve Bank has always been conscious of the need to bring every citizen of the country within the ambit of the banking system. Appreciating the difficulties of banks to viably operate bank branches in every village, we had permitted them to appoint Business Correspondents (BCs) to address this. On demand from the industry, we have also permitted "for profit" companies to be appointed as Business Correspondents, which would enable a healthy fusion of the expertise of banks and the communications and agency network of non-banks, specially the MSPs. Though partnerships between banks and MSPs are happening, the pace is far too slow and the process needs to be expedited.

Limitations and problems of Mobile Banking

- Despite a high base of mobile phone users, the smart phone penetration is limited, less than 20%. This restricts use of full scale mobile banking; users can't download banking app on basic phones. They have to depend on SMS, which is cumbersome.
- A user can have up to nine mobile phone numbers (allowed by TRAI) but only one mobile bank account (says RBI). And the limit of transactions for mobile payments is Rs 50,000 per month.
- The mobile payments model via telcos makes money on scale. According to Airtel it will take two years to be relevant and five years to make money. Mobile payments today are at the same stage as credit cards 20 years back and ATMs 15 years back.
- Despite being convenient, the cost of Know Your Customer (KYC) for mobile banking or mobile payments is huge - Rs 400 to Rs 500 per person. This is more than the average revenue per subscriber (ARPU) for telcos.
- Less than 10,000 outlets today accept Airtel Money or any other mobile payment. There's no incentive for merchants to accept mobile payments as they don't get any commission.

Future of Mobile Banking

Mobile banking is the future because of its cost effectiveness and ability to reach out to customers in remote areas. It will

take 5-6 years for the model to mature. In US, Europe, phones with NFC (near field communication) have entered the market. NFC is a chip embedded in a phone enabling the phone to interact with a point of sales terminal (with this, phone can act as a virtual credit card). Cheque truncation can be done via mobile phones. In US it is called 'Cheque 21' or 21 st century cheque payment. Not yet available in India. Banks will be able to approve and give loans via mobile banking within the next five years. This will further reduce the need to go to a branch.

Conclusion

The mobile banking is moving up on the adoption curve is evident in the number of implementations both on a pilot and real-time basis and also from the level of interest evinced in the discussions held among the various stakeholders. It is also evident in the number of TSPs emerging in the mobile banking space. Once awareness is created among the general public on its benefits and more banks offer this service to their customers there would be a further growth in transactions with both existing and new customers using the service. Banks need also have to be proactive in up scaling their mobile banking products and services if they have to safeguard their traditional advantage in the payment system terrain and leverage it to expand their customer base including the tech-savvy Gen Next. The IBA has the wherewithal to do a lot in the area of awareness creation by conducting mass-media campaigns, simulation/training camps, town-hall events and reaching out to schools and colleges across the nation to 'catch them young.' It is expected that these initiatives will bring awareness of the various technology payment products including the mobile banking and the ease with which they can be used to encourage the use of non-cash payment products. There are success stories of mobile banking in states like Bihar, thanks to the initiatives of the certain NGOs and banks, which has enabled not only financial inclusion but made less literate people mobile banking-savvy. This needs to be emulated through adequate publicity and education to achieve M-powerment in a significant way.

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