Transforming Banking through Telecom - An Approach

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Abstract

India presently faces the challenge of achieving financial inclusion, with the banking system estimated to be covering only 400 million of India's population of 1.2 billion. As per Reserve Bank of India (RBI) data, current users of the banking system are largely in urban areas. An important aspect of achieving financial inclusion is also to provide a means for cash management in a safe, effective and low-cost manner. The well-documented telecom boom in India with an estimated 900 million individual users provides a potential framework that could transform the banking system in India. This paper proposes a framework for mobile phone companies to offer payment services to start with, called "payment banks". New technologies can reform the banking sector apart from giving a much needed impetus for the cause of financial inclusion and will be a large step forward in spreading banking services to millions of new clients in the under-banked regions of India. The need for a "Payment Bank" has been discussed in the NachiketMor Committee Report of the RBI. Our paper formulates a theoretical model for achieving financial Inclusion by leveraging advantages in technology in India and enabling select Telecom operators to offer rudimentary cash management services to start with before offering a bouquet of financial services products to the vast majority of India's population who do not avail of the existing network of Banks. The paper suggests possible basic changes to enable this process apart from using existing infrastructure to enable wider dissemination of financial products. An impact analysis of these suggested changes are also discussed along with remedial measures.

Keywords: Financial Inclusion, Payment Systems, Remittances, Rural Banking, Telecom

1. Introduction and Motivation

The challenges of banking sector are to make banking viable for the poor who cannot afford to open an account and to cut the fees for the remittance of money from one person to the other. As per the document on financial inclusion prepared by the Ministry of Finance (Financial inclusion overview 2013)1, the objective of financial inclusion is "to extend financial services to the large hitherto un-served population of our country to unlock its growth potential". As per the Census of India 2011, 58.7% of households in India availed of banking services compared to 35.5% in the 2001 Census. Also, out

of a total of 102,343 functioning branches of Scheduled Commercial Banks (SCB) roughly 60% are in rural and semi-urban areas. The growth in the branches of SCB's from 2009 to now, of about 20,000 additional branches has come about uniformly of about 5,000 additional branches in Urban, Semi-Urban, Urban and Metropolitan areas. What is striking though is in the growth of ATM (automated teller machines) which is related to the theme of this paper, namely Payment Systems. As of March 31, 2013, of the 114,014 ATM's all over India, only 11,564 were in Rural Areas thus highlighting the lag of payment mechanisms of SCB's in large parts of India.

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Again, to quote from the above document, with the objective of ensuring greater financial inclusion and increasing the outreach of the banking sector, banks were permitted by RBI in 2006 to use the services of intermediaries in providing financial and banking services through the use of Business Facilitators (BFs) and Business Correspondents (BCs). Business Correspondents are retail agents engaged by banks for providing banking services at locations other than a bank branch/ATM. BCs and the BC Agents (BCAs) represent the bank concerned and enable a bank to expand its outreach and offer limited range of banking services at low cost, particularly where setting up a brick and mortar branch is not viable. BCs as agents of the banks, thus, are an integral part of the business strategy for achieving greater financial inclusion". The theme of our paper is in proposing a business model with the scheme of a telecom provider in the role of a BC as set out above. As can be seen from the above mentioned data, over the years, the reach of banking in India has widened significantly to include relatively under-banked regions, particularly in rural areas. Commercial bank credit as percent of GDP picked up steadily from 5.8 percent in 1951 to 56.5 percent by 2012. The population per bank branch came down from 64,000 in 1969 to 12,300 in 2012 (RBI data, 2013). Notwithstanding the development of various types of banks, Indian banking sector is yet to meet the desired banking penetration and inclusion as witnessed in most advanced and some of the emerging economies. Based on data given in Basic Statistical Returns2, a publication of RBI, it is estimated that rural India had only 7 branches per 1,00,000 adults in 2011 in sharp contrast with most of the developed and even BRICS economies having over 40 branches. Regionally, northeastern, eastern and central regions are more excluded in terms of banking penetration. India presently faces the challenge of achieving financial inclusion, with the banking system estimated to be covering only 400 million of India's population of 1.2 billion. As per RBI data, current users of the banking system are largely in urban areas. An important aspect of achieving financial inclusion is also to provide a means for cash management in a safe, effective and low-cost manner. The well-documented telecom boom in India with an estimated 900 million individual users provides a potential framework that could transform the banking system in India. Comparing and contrasting Figure 1 and Figure 2, it can be suggested that the linkage between mobile operators

and SCBs can lead to larger coverage in the payment mechanisms in India, hitherto not covered by ATMs. For India, it seems like a natural fit to evolve a system that can use the telecom infrastructure and the mobile telephone network to create an effective cash-management or remittance business that will allow users to store money, transfer it to relatives, friends and business associates as well as pay for goods and services in shops. This mode of transmission of money will also be helpful for the thousands of migrant workers from urban areas that need to send money back to their homes in rural India. In India, mobile banking has been labeled a banking product (and not a telecom product) thus inviting strict rules and supervision.

Present RBI regulations prescribe that an existing telecom operator tie up with a bank to provide a payment service. For instance, Vodafone and Airtel have tied up with HDFC Bank and ICICI bank respectively for such an arrangement. Apart from being a restriction on the system, insisting on such a tie-up can cause a contagion risk, which is of one of the partner's risk being passed on to the other. This happened in the case of the M-Pesa mobile payment system in Kenya, which grew bigger than its partner banks (please refer appendix) and where 70% of the population is covered by the payments scheme via the mobile phone network. Also, another impediment for the adoption of such technologies in India is the regulatory restriction of dis-allowing any "cash-outs"-allowing customers gaining access to balances of money stored on their phones.

2. Potential growth in the mobile payments market

Intuitively, it seems the growth potential is directly linked to the penetration of the Internet in India coupled with the falling prices of data services, spread of 4G systems and the fall in prices of smartphones making access to the internet and mobile services accessible to most of the population with particular emphasis on its impact on the rural population. As per a research report by International Data Corporation (IDC)(July 2014)4 roughly 650m Indians already own mobiles, making the country the world's second-largest market by sales. But in 2013, only about 40m bought smartphones.India became Asia's fastest-growing smartphone market during the first quarter of 2014, with sales rising nearly four-fold year-on-year. **Figure 1.** Estimated % of population with bank accounts in urban and rural areas for various districts of India. Figure 1(a). Urban. Figure 1(b). Rural.



Source: Economic survey of India, 2014.



Source: Economic survey of India, 2014.

Figure 2. Coverage areas of major telecom operators in India for the year 2014.



Figure 3. India's internet user base estimate.

Source: IDC, 2014.





The next five years will each see growth of at least 40 percent; the IDC group predicts (Figure 3). Ultimately it is falling prices, not faster connections that will further spur India's smartphone growth Google's Android One – which is poised to be used as a base for handsets made by. Micromax, Karbonn, and other Indian manufacturers – will be notably inexpensive,

notably inexpensive, retailing for as low as \$100. Finally, the following chart (Figure 4) by the Technology Consultancy Counterpoint (August 2014) reveals the trend in growth of SmartPhones with their enhanced security and encryption features provides an ideal platform for the growth of Mobile Payments mechanisms in India. This paper formulates a theoretical model for achieving financial Inclusion by leveraging advantages in technology in India and enabling select telecom operators to offer rudimentary cash management services to start with before offering a bouquet of financial services products to the vast majority of India's population who do not avail of the existing network of banks. One such model in existence is M-pesa, the details of which are provided in the appendix. We look at the structure of the existing models and propose an improvement over them. The paper suggests possible basic changes to enable this process apart from using existing infrastructure to enable wider dissemination of financial products. This would help policy makers reach a wider section of the society and hence help in financial inclusion.

3. Literature Review

The Mor⁵ report highlights the fact that Indian performance on financial inclusion is poor and uneven across the country. The report states that 90 percent of small business does not have links with formal financial institutions and 60 percent of the population does not have operational bank accounts. Hence there is a need to find ways to reach the unbanked sector of the Indian economy. The report also identifies that the large growth of mobile subscriber base in the rural areas of the countries provides an opportunity to leap frog over the rest of the world in achieving financial inclusion. Counties such as Kenya, Brazil and Africa have been able to transform their payments systems with the use of mobile payment networks providing an example for India to emulate.

Kpodar and Andrianaivo6 study the impact of mobile phone roll out on economic growth in a sample of African countries from 1988 to 2007. Their results indicate a positive relation between mobile phone penetration on economic growth and a stronger impact on economic growth in countries that have adopted mobile financial services. In a similar study Aker and Mbiti7 explore the impact of mobile money systems on economic development. They comment that mobile money systems have provided a gateway for formal financial services and have expanded the breadth and reach of money transfer systems. The Consultative Group to Assist the Poor (CGAP)8 report describes how the use of information and communication technology has been transformational in reducing the cost of providing financial services to the unbanked sector.

The report differentiates between the traditional bank based model wherein customers have a direct contractual relationship with a financial institution with the branchless banking model, where in customers do not have a direct contractual relationship with a financial institution but exchange cash with a retail agent in return for a electronic record of value either on mobile phones or plastic cards. Mobile phones banking based models have been at the forefront of branchless banking. Chibba9 discusses how mobile payment systems have been adopted in countries such as Guatemala, Philippines, Brazil, Nigeria, Maldives, Ghana, Mangolia etc, that have allowed the use of technological based solutions to bank the unbanked segment of these countries. Yaron 10 while reviewing the success of rural financial institutions in Thailand, Indonesia and Bangladesh observes that the use of mobile banking has enhanced accessibility and also reduced transaction costs for creditors, bankers and savers in a most dramatic and efficient manner. Reporting on the phenomenal success of mobile payment system M-PESA in Africa. Mas and Radcliffe11 claim that the three important lessons emerge from M-PESA's success - the first being the ability to leverage technology to make financial services available to the unbanked poor, second being the use of a revenue model that is usage based rather than the float based model used in traditional banking and lastly making available a platform that empowers the end customer to meet a broad range of payment requirements. In an annual survey on the state of mobile payments industry at the end of 2013, Penicaud and Katakam 12 find that there were 219 mobile payment services in 84 countries, with mobile money available in most emerging and developing markets. There has also been a substantial growth of mobile money services outside sub Saharan Africa with a major thrust in Latin American countries.

Hence the review of literature finds that there is sufficient evidence that the use of mobile payment system has been successful in improving financial inclusion (see e.g. CGAP, 2008; Kpodar and Andrianaivo)6,8 and also has been successfully adopted in a number of emerging market countries (Chibba; Mas and Radcliffe; Pénicaud and Katakam; Yaron)9–12. We next look at the different models that have been used for mobile payments. The different models for mobile payments adopted by developing markets have been described by Flood, West, and Wheadon13. The model used in Africa (M-PESA and Safari) is based on stored value funds and a network of agents; in South Africa (Wizzit) which is based on branchless banking service that customers access through their mobile phone; in Philippines (Smart Money) which is a stored value funds under the customer's name in a bank; Samoa, Fiji and Tonga (Digicel Mobile Money) based on funds held in trust accounts operated by a network of agents; Papua New Guinea (MiCash) is based on bank accounts operated through mobile phones.

Carr14 lists three basic models for mobile payments - the bank account based models, credit card based model and the telecommunication company billing based mode. In the bank based model the customer's bank account is linked to the mobile phone number and is the customer account is debited at the time of payment. In the credit card based model, the credit card is linked to the mobile phone and the credit card is charged for payments made by the customer on the mobile phone. In the telecommunication company based model payments are charged to the customer account either against pre paid amounts or on the basis of a post paid subscription. In this study the existing models of payment have been explored using secondary data to arrive at a proposed model for the Indian mobile payments market.

4. Objectives and Methodology

After the review of literature the following objectives were formulated for the study:

• To evaluate the existing model of mobile payments in India. This would help us understand the gaps in the existing model and also the structural organization of the service in India. As mentioned in the literature review section, there are a lot of variations available in the world for mobile payments. To know which one is being adopted in India would provide the basis for proposing a new model.

• To propose a possible model as an improvement over the existing models and perform an impact analysis of the new model. The impact analysis would have implications for regulators in India. It would bring out the challenges which the proposed model will have to face and possible recommendations to meet the challenges.

To meet these objectives, the data was largely collected from secondary sources like RBI reports, IDC research reports etc. The methodology adopted for the research involved a theoretical framework of model building. The first step was to assess the growth potential of the payment mechanism, the next step was to understand the current model and finally propose a new model for payment banks with the impact analysis. Impact analysis was done by identifying the challenges for the regulators due to the improvements proposed in the new model. It incorporates the impact which the new model will have once introduced in India.

5. Existing Model in India -Challenges and Opportunities

Thus, presently a customer x of a mobile service provider funds her wallet via the existing payment mechanisms, like net banking/debit or credit cards. The wallet is essentially a storage device for money that provides convenience to x to pay for services like utilities, transport companies, entertainment outlets like cinemas and restaurants. Thus x pays for these services simply by using his mobile phone and obviates the use of his credit/debit card or for her to remember the internet password. Thus the existing system is an add-on convenience for existing customers such as x.

6. Proposed Model for Mobile Phone Companies to Offer Payment Services

It has been exactly 20 years since Bill Gates sent shockwaves through the banking world by declaring that banks be dinosaurs that can be bypassed. In the 20 years since then, the internet has disrupted many industries profoundly but not so much banks. The banking market is still dominated by the banks that were in control of it 20 years ago, issuing the same credit and debit cards. How did they do it?

Basically due to the fact that entry barriers to banking are high, governments issue banking licenses and banks are subject to audit and compliance regulations and government that are huge entry barriers for many new entrants. Quite a few banks are many years old, some even as old as 200 years!

Some of the innovators may underestimate the need for some of the existing banking customers to need someone else to look after their money or indeed transfer it to beneficiaries. Most customers rank trust as the highest priority in choosing banks for their needs and the fact that established banks do have a repository of trust going many years is a huge advantage for them when it comes to banking relationships and in catering to customers for new products and services.

The challenge for banks therefore is to use emerging technologies to further enhance their relationships with their existing and potential customers by positioning themselves as utilities. There is a lot of interest of late in mobile payments wherein customers use their mobile phones to make payments. some of the recent developments in this area are in the development of apps which are not developed by banks viz apple pay, google wallet, pay pal (shortly to be spun off from ebay), m-pesa which is offered by a mobile phone company that allows a user to transfer money only through the mobile company and not through any bank and finally, bit coin. m-pesa in Kenya and Tanzania use a push mechanism that transfers money from the sender to the receiver without the receiver not even knowing about the details of the sender (refer to appendix). It is interesting but the other mobile payment systems listed above do ultimately use the payment mechanisms of Banks to settle the transactions and deliver money to the recipient.

Technology is already making a huge change to banks as most of them are moving their services to digital forms. Most banks are re-engineering themselves internally to offer services to clients on the internet. These are huge changes and the disruptive tendency of the internet in other industries in the case of banking is from the inside of the banks.

At best some of the new players can emerge as custodians but ultimately the payment mechanisms will be those of established banks.

It is indeed very easy to be wrong about the future of mobile payments. In 1997 leading banks in the USA (Citi mobile wallet) issued mobile wallets that were essentially stored value cards. But these schemes did not succeed and closed in a year's time, as customers did not want to carry this extra card in addition to those they already had in their wallets.

Figure 6 provides the framework of the proposed model. Thus, given the experience in more mature banking markets as detailed above it does seem prudent for mobile telecom companies to enter into strategic tie-ups with existing commercial banks (CBs) of repute and offer payment gateway services to their mobile clients whilst using the banks existing payment mechanisms to deliver and receive the proceeds of remittances. This assumes that the present branch licensing policy of the RBI gains

traction and more rural and un-banked areas of India are covered by a bank branch. it is also suggested that those areas where the CBs are not represented, they enter into "correspondent payout points" tie-ups with other bank branches in that area ideally and to take the coverage further, with outlets of FMCG, automotive companies (whose coverage of unbanked areas is complementary to that of the banking system)/mobile company customer service centers (with suitable safeguards, escrow account mechanism) to deliver such end-use services to existing mobile customers. As an illustration, we consider the same customer x as the earlier example. As per our model, x now has the flexibility to pay out in cash at any of the outlets discussed above, thus offering a transformation of existing services. Also x can pay out cash to any beneficiary without the use of a bank branch to fulfill the payment. Assuming x suddenly requires cash to be paid out to his near and dear ones who are travelling and need money for payment for some service, the money can be readily be made available. As an extension, it would also be feasible to transfer money between the wallets thus also enabling settlements of a retail basis. For example, x goes to an event for which expenses are to be divided between the participants, such a mechanism will simply enable x to transfer her dues simply to the wallet of another beneficiary without the use of actual cash for settlement. Hitherto such exchanges between two individuals could only occur by cash settlement. The proposed wallet-towallet exchange will be a digital leap forward in such settlements. The essential breakthrough of this model is to allow two people to exchange money DIRECTLY with each other, without the need for an INTERMEDIARY and to do this wholly DIGITALLY.

7. Implications of the Model

With a nomenclature of "Payment Banks", such a development will be transformational in our country and go a long way in bringing financial services to the vast population who live in rural areas and are poor. This would also help in bringing in wider competition in the banking sector (which is the stated policy of the RBI Governor Dr. R. Rajan). New technologies such as the one under discussion can reform the banking sector apart from giving a much needed impetus for the cause of Financial Inclusion and will be a large step forward in spreading banking services to millions of new clients in the under-banked regions of India.



Figure 5. Payment banks' and mobile operators' existing model in India.





As well as being convenient, the payment banks can also impact in many ways. Increased remittances with lower transaction costs for individual customers and small businesses and a push to other banking products will contribute to economic growth. Possible benefits could be a move away from gold and cash into bankable assets that are productive both to the investor and the economy. It can aid in reducing corruption by direct payments by the customer and delivery can be effective.

The model will pose certain challenges for the policy makers. These include:

1. Contagion risk (ring fencing the subsidiary of the telecom company).

2. Authentication of the customer (TRAI guidelines should suffice or Aadhar).

3. Impact on existing banks (seems minor considering more assets will move into the banking system via the transfer from gold and cash).

4. Protection for the customer (anti-money laundering provisions and basic products viz remittance only). If the challenges are met with proper policies, the proposed model might be beneficial for financial inclusion for a country like India and provide a higher level of financial deepening apart from the spread of banking services.

8. Conclusion

Mobile payment banks would be a boon for financial inclusion for India. Indian regulators have already taken the steps in this direction and have approved a structure of payment mechanism using mobile phones. Our paper examines this model and provides an improvement over the existing model by incorporating wallet -to-wallet exchange. We propose cash out option as an extension to the existing model which will enable two people to exchange money directly with each other, without the need for an intermediary and to be able to do this digitally. The paper also provides the impact this model might have once introduced in India. The model has implications for Indian policy makers and thus for the rural population as well. If implemented in its proper form and structure, the model will be helpful in meeting RBI's objective of financial inclusion.

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Appendix: M-Pesa Profile

No. of customers for Safaricom	6 mn, 70% customer base penetration
P2P transfers	USD 1.6 mn
No. of retail outlets	9000
Demand Driver	Rural to urban migration
Safaricom	Market Share-77 percent Customer base-13.3 millions
GOOD SERVICE FEATURES OF M-PESA'S MONEY- TRANSFER SERVICE	 Retail agents required to display corporate branding, Safaricom green Agents exclusive to Safaricom, greater control M-Pesa application on user's Mobile Phone Applicant can use security on user's mobile to encrypt message end to end
Frequent and consistent monitoring of retail agents	Safaricom manages agent training programs
Scalable agent distribution for liquidity management	 Safaricom needs to monitor agent's availability of working capital Liquidity management through: Safaricom's own airtime resellers (also known as master agents) Group 4 Securicor Branches of Equity Bank Large supermarket chains Working model for liquidity management: Master agents set up accounts in banks nearest to retail agents to facilitate cash withdrawal and deposit Money transfer between retail agents and the master agent's banks accounts are subsequently offset by opposite transfer of M-Pesa electronic values Safaricom require master agents to operate in at least 2 provinces to manage the net cash level for the master agent Master agent require at least 3 days to retrieve the value for the electronic value they sell to Safaricom Settlement Bank of Safaricom- Commercial Bank of Africa For liquidity management services, the commission breakdown for the different parties is given below:

The agent log	Turner stion via M Dass confirmed through SMS
The agent log	Iransaction via M-Pesa confirmed through SMS
	by Safaricom to both the parties
	• SMS contain electronic receipt, that can be
	applicable for dispute resolution
	• Receipt:
	Sender and recipient detail
	Unique transaction number and account
	balance of the customer's M-Pesa
	account
	Retail agents also have to maintain paper-based logbook,
	especially for cash transaction at the retail agents.
Agentlog	• M Dece Balance
Agent log	Data agent transaction ID
	• Date, agent, transaction 1D
	• Iransaction type
	• Customer details (Name, Phone Number,
	National ID)
	• Customer signature on log book
	• Log book maintained at three levels:
	Retail agent
	Master agent
	Safaricom
	• All transactions captured by Safaricom
	electronically to reflect in the Web Management
	System for the reference for master agents
	, , , , , , , , , , , , , , , , , , , ,
Customer Fee	• Subtracted from the customer's M-pesa account
	by Safaricom through their master agents
	• Chapter to cond money to a registered user
	• Cheaper to send money to a registered user
	Non registered user
	• Non-registered users get a code via SMS, which
	they convert into M-Pesa by presenting at the
	retail agents
Enabling ATM withdrawals	• M-pesa partnered with Pesa Point, largest ATM
	service provider in Kenya
	• Customers retrieve money from any of the
	PesaPoint ATMs by selecting "ATM withdrawal"
	from their M-PESA menu.
	• The customers then receive a one-time ATM
	authorization code, which they use to make the
	with-drawal
	 Bankcard not needed for this transaction
	- Dankeard not needed for this transaction.
Disadvantages as a savings product	M-Pesa does not pay interest
	It is not fully regulated by Central bank of Kenya
	it is not taily regulated by Central Bally of Kellya

Competitors (Kenya)	• Zap
Competitors (Kenya)	 Zap Advertised as "mobile wallet" Promoted by Zain Users of Zap can make their grocery payments at Nakumatt, the largest supermarket chain in Kenya Unlike M-Pesa, cash in/cash out fees are recommended rather than remaining fixed
	• This allows customer negotiation platform for customer fees with his retail agent