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Mobile Payments in India

New frontiers of growth



India is pre-dominantly a cash economy with greater than 65% of all retail transactions being conducted in cash. With the growing middle-class and their increasing disposable incomes, this presents a huge opportunity for non-cash methods of payment. All the current non-cash payment modes viz. credit cards, debit cards, multiple mobile payment solutions, appeal to only a small section of the ecosystem. While the ubiquitous mobile is surely the most promising channel, the need of the hour is to develop an innovative mobile payment system which is customized to the Indian ecosystem requirements and has a mass appeal.

Contents

Message from ASSOCHAM	4
Message from Deloitte	5
Message from Businessworld	6
About ASSOCHAM and INFOCOM	7
Introduction	8
Non-Cash Retail Payments: Current Scenario	10
Non-Cash Retail Payments: Time for Innovation	13
The Road Ahead	18
Acknowledgements	20
Notes	21

Message from ASSOCHAM

ASSOCHAM also known as the country's "Knowledge Chamber" has always been at the forefront for promotion of new technologies for benefit of the industry yet remaining technology neutral.

ASSOCHAM is committed to moving forward with such rapid changes in technology and its uses, consistent with our goal of "Making Inclusive Transformation Happen". ASSOCHAM firmly believes that digital inclusion could take the path of high growth to all sections of the society and it is the mobile that will empower the common man in the hinterland and far flung areas in the country.

Mobile phones are certainly the solution for bridging the digital divide and therefore, are the perfect medium for delivering a variety of services to the common man.

The Indian economy has been on a fast track of growth. This rapid growth, besides the 8.5% GDP has seen other interesting numbers as well. India has been the fastest growing mobile market with more than 720 million subscribers. There is a rat race among the operators to retain customers with innovative applications and Value Added Services. The telecom players desperately want to own the 'mobile wallet' of the 300 million + middle class who have the purchasing power.

Mobile money provides an opportunity for financial inclusion to the unbanked section which lies closer to the base of the pyramid. Majority of the rural population and a part of even the urban class who live in the informal financial sector relies on cash to conduct all financial transactions. This ratio of cash transactions is as high as 65% of total transactions. As such they lack access to credit, insurance and savings. On the other hand, cash

In this regard, ASSOCHAM has partnered with Deloitte in bringing out a report on 'Mobile Payments in India' with an objective of identifying key elements and parameters that could facilitate an optimum ecosystem to support entrepreneurship.

I am also pleased to inform you that ASSOCHAM along with Deloitte has brought out a comprehensive study on "Mobile Value Added Services (MVAS) - A Vehicle to Usher in Inclusive Growth and Bridge the Digital Divide" for Telecom Regulatory Authority of India along with inputs from various concerned Ministries, Department and the Industry, which was well received.

I would like to acknowledge the efforts made by ASSOCHAM and the Deloitte team in making this report more meaningful.

transactions are untraceable, unrecorded and lead to parallel economy. Annually, Gol loses a lot of revenue due to non tax payment. Mobile money is a transparent mode of money transfer and will help in reducing parallel economy to a great extent, giving additional revenue to the Gol.

This wave of mobile money momentum, if facilitated by regulation and right business model, will revolutionize the payment system, from coke to railway tickets. Japan has proved that smart phones are not necessarily the only devices needed for mobile payment. Kenya's mobile money system is another good case study. More so because Kenya's 61% population is unbanked.

Mobile payment is a must for India to retain its growth, where most do not have a bank account but have a mobile phone.



D. S. Rawat,
Secretary General,
ASSOCHAM



Sujata Dev,
Co-Chairperson (M&E),
ASSOCHAM

Message from Deloitte



Sachin Sondhi

Senior Director and Leader,
Strategy & Operations
Consulting, Deloitte

India, the second fastest growing economy in the world, has a large and growing middle class today. In spite of this growth, 'cash' continues to dominate our retail transactions. Both the penetration and usage of the non-cash modes viz. credit cards, debit cards, the multiple mobile payment solutions, have been well short of the potential posed by 'cash' transactions in India.

India is vastly different from the West in terms of our demographics, our retail industry (very distributed, large % of unorganized retail, significant presence in rural India), our shopping / paying culture (low ticket, high volume transactions), etc. We believe that the products (credit cards, debit cards, etc.) which have done well in the developed countries, appeal to a small section of the ecosystem in India, hence may not be the complete solution for a country like ours.



Sandip Biswas

Director, Technology,
Media and
Telecommunications
Practice, Strategy &
Operations Consulting,
Deloitte

The growth seen by the Indian mobile telephony sector over the last decade has been truly phenomenal. Mobile, as a device, has become pervasive in all the dimensions of our day-to-day life, even surpassing television that so far has been the king in terms of its reach and influence on the masses.

In a cash economy like India, where over 65% of all retail transactions are conducted in cash, there is a huge potential for transitioning towards effective non-cash payment instruments. The future of non-cash payments in India is closely linked to the evolving regulatory framework and innovative payment solutions that would come to the forefront. In a recent amendment

The mobile is arguably an ideal mode for capturing this significant gap. An innovative solution, which meets the requirements of the ecosystem players - consumers, merchants, banks, and has a mass appeal, has the capability to capture the large USD 410 billion retail market in India.

While it would be exciting to witness the changing modes of payment in retail transactions in India in future, there is little doubt that the current payment modes in our market-place leave a large void. Players, who work towards filling this gap, keeping in mind the peculiarities of the Indian market, could carve out a high-value proposition for themselves and the ecosystem.

announced in November 2010, the Reserve Bank of India allowed usage of semi-closed instruments for bill payments, ticketing requirements as well as issuance of semi-closed instruments by banks through key agents. The real potential of non-cash transactions can be unleashed only when key stakeholders involved in the development of the mobile payments ecosystem together take concerted steps in this direction. This report presents our view on the current scenario of non-cash payments in India and showcases how India is a fundamentally different market from most other developed and developing countries. Hence, the solution needed for a unique nation such as ours also needs to be one that is innovative, yet simple, safe and scalable.

Message From Businessworld

One of the biggest problems faced by the poor people of India is that they have to do all their transactions in cash. Most of them do not have any other options. A large number of them do not have bank accounts. This is partly because of choice – some of them do not trust banks. But many of them also do not have access to banks because they are migrant workers and often cannot meet the know your customer norms of banks. Even if they have a banking account, they are mostly ineligible for credit or debit cards because of their low incomes. And because cheques are not accepted for most retail transactions, even the poor who have bank accounts invariably have to do all their dealings in cash. Is there any viable alternative to cash for the poor in India? The mobile phone as a means for carrying out transactions has often been touted as the best option. The reason is that mobile phone usage has really taken off. Mobile pen-

etration far surpasses those of almost any other media. Even people in low-income professions – drivers, maids, plumbers, electricians etc – invariably have a personal mobile phone. The combination of ultra low calling charges and basic and inexpensive mobile handsets has seen mobile phone ownership and usage become ubiquitous.

The problem is that while a lot of different companies have tried out different mobile transaction systems and models, none of them have taken off in a big way. There are many hurdles that need to be surmounted before mobile phones as a means of monetary transactions can become widespread. Regulations, technology and standardisation of systems are just some of these hurdles.

It is in this context that this report by Deloitte becomes so important. This report looks into all the issues that are blocking the usage of mobile phones as a means of monetary transactions in detail. And it looks at what needs to be done.



Prosenjit Datta
Editor,
Businessworld

About ASSOCHAM

The Associated Chambers of Commerce and Industry of India (ASSOCHAM), India's premier apex chamber covers a membership of over 300,000 companies and professionals across the country. It was established in 1920 by promoter chambers (Bombay Chamber of Commerce & Industry, Cochin Chamber of Commerce & Industry, India, Merchants Chamber, Mumbai, The Madras Chamber of Commerce & Industry, PHD Chamber of Commerce & Industry) representing all regions of India. As an apex industry body, ASSOCHAM represents the interests of industry and trade, interfaces with Government on policy issues and interacts with counterpart international organizations to promote bilateral economic issues. ASSOCHAM is represented on all national & local bodies and is, thus, able to pro-actively convey industry viewpoints, as also communicate and debate issues relating to public private partnerships for economic development.

ASSOCHAM members represent the following sectors:

- Trade (National and International)
- Industry (Domestic and Industrial)
- Professionals (e.g. CAs, lawyers, consultants)
- Trade and Industry Associations and other Chambers of Commerce

ASSOCHAM operates through 90 Expert Committees that provide an interactive platform to Members for interaction and id formulating Policy recommendations so as to facilitate Economic, Industrial and Social Growth.

These encompass areas such as: Domestic & International Trade, Commerce, Industry, Services, Agriculture, Education, Food Processing, IT & BPO, Economic Affairs, TQM, Energy, Environment, Capital Market, Banking & Finance, Direct & Indirect Taxation, WTO & IPR, Infrastructure, Pharma, Health, Biotechnology & Nanotechnology, Tourism and Telecom.

Leading Corporates like Aditya Birla Management Corporation Ltd., Boeing, DLF, IBM, Reliance Communications, Reliance Industries, TATA, Northrop Grumman, Cable & Wireless, Warbusrg Pincus, SREI Infocom, Ernst & Young, Huawei telecommunications, ZTE telecom, Qualcomm, Centurion Bank of Punjab Limited, Diageo India Pvt. Ltd., DSP Merrill Lynch, Geojit Financial Services Ltd., GMR Infrastructure Ltd., ITC Limited, Jet Airways (India) Private Limited, Kotak Mahindra Asset Management Co. Ltd, Microsoft, Spice Communications Pvt. Ltd., Videocon Ltd., Vodafone are some of the Esteemed Members of ASSOCHAM.

About ASSOCHAM please log on www.assochem.org

About INFOCOM

INFOCOM, a Businessworld initiative from the house of ABP was initiated in 2002 as a forum that would demonstrate India's quest to be the IT superpower, and has today turned into a forceful and dynamic event that sets the pace for development in the Information and Communication Technology (ICT) sector, bringing potential partners together and helping the industry connect with associates and customers. INFOCOM is the largest congregation of ICT professionals, buyers-sellers, corporate leaders, academics, visionaries, and policymakers in India.

INFOCOM runs on the format of a Conference and Exhibition and closely works with all stakeholders to create a powerful platform that endeavours to synergize and aid this process of change and transformation in India and abroad. It brings together some of the best global minds in hardware, software, telecom together with the experts on the business side from

various industry verticals and policy makers to brainstorm, showcase, network, build brands and prepare for the best that is yet to come. At INFOCOM it has been our constant endeavour to provide various platforms in the form of conferences, exhibitions, roundtable discussions, leadership awards, knowledge workshops etc in order to project the potential of the Indian ICT industry as an engine of economic growth to the nation and beyond.

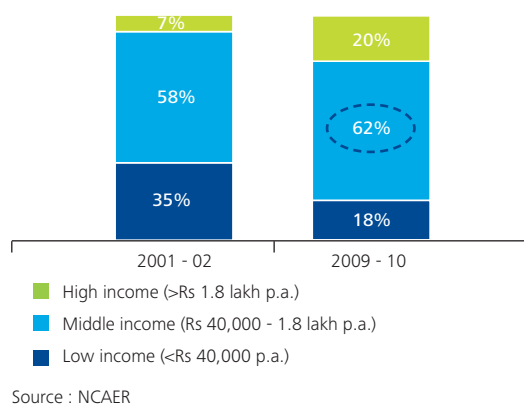
About INFOCOM log on www.indiainfocom.com

Introduction

India: A growing, but cash economy; holds a significant opportunity

The Indian economy has shown strong growth in recent years, making it a USD 1.3 Trillion economy. It is expected to grow at a rate of 8.9% in future¹, making it the second fastest growing economy in the world, after China. This growth has enabled India to create a large middle class consisting about 62% of its total households (Refer Figure 1). The large middle class base in India is driving consumption, fueled by their increasing disposable incomes.

Figure 1: Distribution of Indian households (based on annual household incomes)



However, India remains predominantly a cash economy due to high prevalence of cash in day-to-day transactions. The retail industry, which has transactions up to USD 410 billion per year² is predominantly cash based. Cash continues to be the only mode of transactions for the 40% unbanked population in the country. Overall, 67% of transactions are carried out in cash, while only 33% are done through electronic means (Refer Figure 2).

Within electronic payments, while credit and debit cards form 57% of transactions by number, they transact only 13% by value (Refer Figures 3 and 4). The largest electronic payments by value are through electronic funds transfers (NEFT or RTGS) which are predominantly peer-to-peer (P2P) transactions. These would not be used for retail payments, and the same can be said for Electronic Clearing System (ECS) payments. Hence, the usage of electronic payments in retail transactions (payments to retail outlets) is even lower, presenting a huge opportunity for players providing non-cash payment alternatives for retail payments.

Figure 2: Percentage of transactions in India by volume (2009-10)

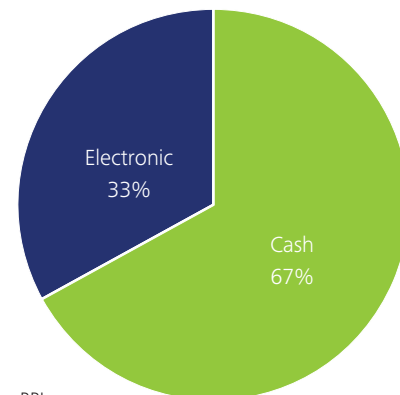


Figure 3: Distribution of electronic payments by volume in India (2009-10)

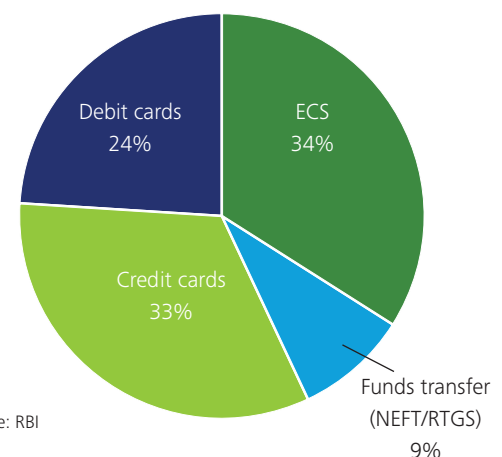
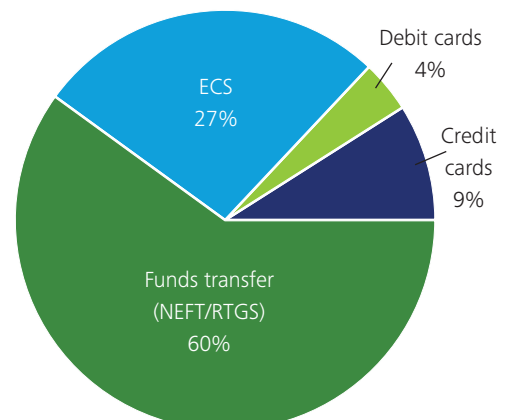


Figure 4: Distribution of electronic payments by value in India (2009-10)



¹ According to Q32010 estimates

² ATK Global Retail study, 2010

India's 'cash economy' presents significant problems, such as:

- Fraud – The number of counterfeit notes found in India are around 3 to 6 per million³. The actual number of fake notes could be much higher in the country. Such counterfeit currency is used to fund illegal activities, and adds to the 'black' money circulating in the economy
- Cost to the economy – The number of notes in circulation in the Indian economy is about 49 billion, increasing at a rate of about 10% per year³. Printing notes, distributing notes, destruction of old notes and replacing them with new notes, carries a huge cost to the economy
- Inconvenience of carrying cash – Carrying large amounts of cash is inconvenient and carries the risk of being stolen

- Tendering exact amount of cash – Providing the exact amount of change in any transaction is inconvenient for the consumer and the merchant

Thus, increasing the percentage of non-cash mode of payment, not only provides a significant opportunity from a business perspective, but also holds significant benefits to the country from economic and social perspectives.

In this paper, we attempt to explore the ways in which this large opportunity can be tapped. In the following sections we identify the current non-cash retail payment methods, identify the associated key challenges, and define potential ways to overcome these challenges.



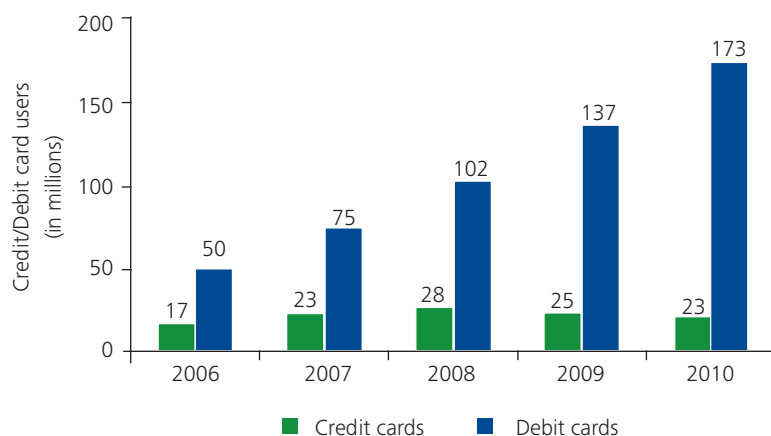
Non-Cash Retail Payments: Current Scenario

With increasing adoption of technology by Indian banks, electronic payment modes have started gaining importance. Credit cards, debit cards and multiple mobile payment products are the various modes of non-cash retail payment system that exists today.

Credit and Debit Cards

Number of credit cards in circulation in India has started to decline since 2008, while the number of debit cards continues to rise. Though the usage of credit as well as debit cards have increased in the past decade, card penetration remains low, with debit cards at 13% (about 173 million) and credit cards at 2% (about 23 million) (Refer Figure 5). Despite the presence of non-cash payment modes, it is noteworthy that cash still remains the king.

Figure 5: Credit and Debit Card Users in India



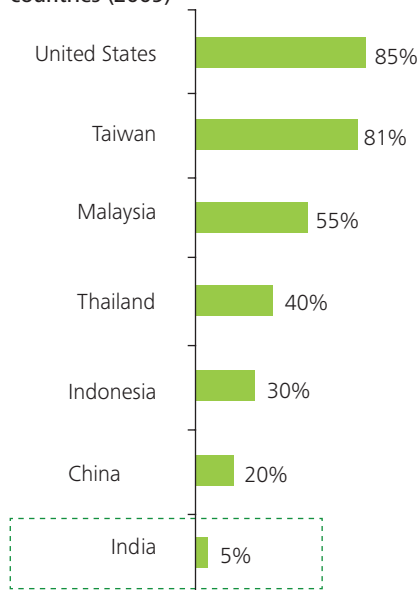
Source : Reserve Bank of India, IAMAI, Cellent

India's efforts to move away from cash-based transactions have been greatly influenced from some developed nations. For instance, the use of credit card as a payment instrument originated and is very popular in the United States. Use of a smart card that corroborates the user's identity for each transaction began in France. Globally, cards remain the preferred non-cash payment medium by volume; with over 40% payments in most markets and close to 60% globally being made by cards. India adopted these payment methods from such countries over the last three decades. India, however, has seen extremely low debit and credit card penetration.

We believe that India is fundamentally a very different market from the other countries where payment by cards has been successful:

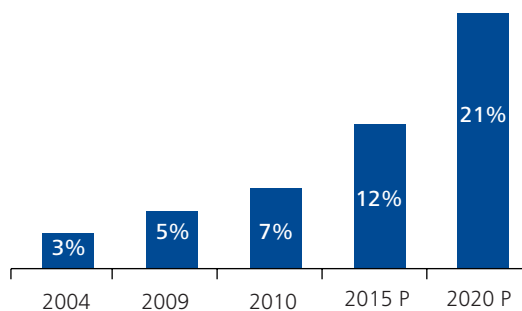
- **Our retail industry is widely distributed:** Organized retail penetration in India at about 5% in 2009 (Refer Figure 6), is significantly low as compared to other developed and developing markets. While it is expected to grow with increasing urbanisation and incomes, it would continue to be on the lower side (Refer Figure 7)

Figure 6: Organized retail penetration across select countries (2009)



Source: Technopak, PL research

Figure 7: Organized retail penetration in India



Source: PL research

- **Ticket size of our transactions is low:** Due to the widely distributed, pre-dominantly unorganized retail industry, ticket size of the transactions in India continues to be low
- **Pre-dominantly rural populace:** About 70% of the Indian populace continues to live in rural India

In the rural parts of the country, the distribution of retail outlets is even wider, with the ticket size for the transactions being even lower

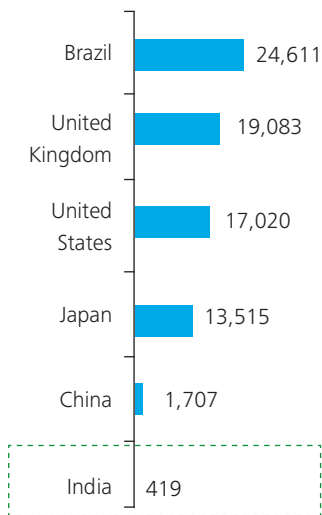
The above characteristics of the Indian marketplace make the card business for the ecosystem very costly and difficult to sustain in India.

Comparison of the returns per PoS Terminal (Refer Figures 9 and 10), both by volume and value, show how cumbersome it is for the Indian ecosystem to meet the associated costs: cost of the PoS terminal, cost of issuing the cards, etc. Value of payment transactions at PoS terminals remains extremely low in India at INR

71 thousand crores as compared to INR 848 thousand crores in Brazil and INR 4,522 thousand crores in China. On an average, the debit and credit cards together account for only two card transactions per day per PoS terminal in India, which is close to half as compared to China and one-eighth as compared to UK.

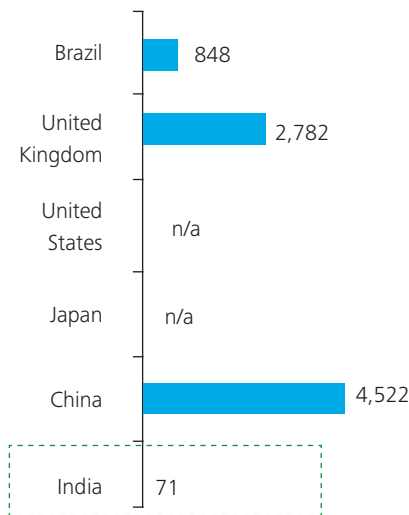
This 'low feasibility' of the PoS terminals in India, explains the abysmally low penetration of PoS terminals (Refer Figure 8). The penetration of PoS terminals in India remains low at 419 terminals per million inhabitants in 2009, as compared to about 1,700 in China, over 17,000 in United States and United Kingdom and about 25,000 in Brazil.

Figure 8: Number of PoS terminals per million inhabitants, 2009



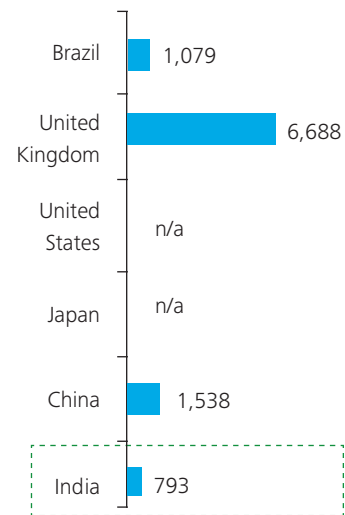
Source: Bank for International Settlements

Figure 9: Value of payment transactions at PoS terminals located in the country in 2009 (INR thousand crores)



Source: Bank for International Settlements

Figure 10: Number of PoS transactions per terminal located in the country in 2009



Source: Bank for International Settlements

In addition, certain key concerns of the ecosystem with respect to usage of cards, further inhibit rate of adoption of credit /debit cards in India (Refer Table 1).

Table 1: Concerns in using Credit and Debit Cards

Concern	Merchant	Customer
Hidden costs	<ul style="list-style-type: none"> Processing fee per transaction charged by credit card companies, eroding merchant's profit margin Some credit card processing firms also charge application fee, startup fee, activation fee, statement fee, monthly minimum fee, payment gateway fee, charge back fee and termination fee from the merchant 	Late fee payment charges and high interest rates levied by credit card companies
Limited usage	Unreasonable pricing of cards acts as disincentive for small and medium merchants with lesser pricing power due to low volumes, to transition to card based payment	Usage limited primarily to large vendors / merchants that have PoS terminals installed and accept debit and credit cards
Privacy and Security concerns	Not applicable	<ul style="list-style-type: none"> Need to reveal personal information at multiple sites while using debit or credit cards for online transactions Loss of cards that are not encrypted with a pin, leads to insecurity about card usage, bringing down the adoption rate of credit and debit cards by conservative users

National Payments Corporation of India (NPCI) has introduced Rupay, India's first indigenous payment gateway. While introduction of the state-backed Rupay may take care of some of the concerns listed above, the cost of the PoS terminal, the cost of issuing the cards, consumer security concerns, etc. may continue to be the road-blocks for mass penetration and usage.

Mobile payment instruments

Another mode of non-cash payments in India are the mobile payment instruments. Various modes of mobile wallets such as prepaid, direct debit, as well as postpaid exist in the market today. Recent amendments to RBI guidelines have allowed non-banks to issue mobile based semi-closed instruments, while also extending their usage to bill payments and ticketing. Most of these mobile payments instruments have been trying to find traction, but concerns exist, inhibiting their widespread adoption. Some key concerns are:

- Privacy: Most of the solutions require phone number, credit card or other personal information to be

shared. Some of them expose bank accounts as well

- Limited Penetration: The penetration of existing pre-paid solutions is by and large restricted to few major cities – the semi urban and rural market remains primarily untapped
- Closed Ecosystems: Most of the solutions require purchase of pre-paid vouchers necessitating a distribution network for loading the mobile wallet. Also, in most solutions, the wallet can be used for only specific type of payments

The non-cash retail payment modes in India face significant challenges and do not have a mass appeal. Therefore, to reap the untapped potential of non-cash payments ecosystem that exists today, India needs a unique and innovative payment solution – one that is simple to adopt and is capable of significantly bringing down the barriers for uptake of non-cash retail payment in India.

Non-Cash Retail Payments: Time for Innovation

Mobile: The Right Vehicle

In a country of over one billion people, there is no doubt that the mobile phone has touched the highest number of lives in India to date. Within a few years, mobile phones have grown from a very small base to overtake even TV viewership in India (Refer Figure 11). Even the penetration of PCs has been mainly restricted to urban India, making the installed base very miniscule at 95 million (Refer Figure 12). Currently the number of mobile phones subscribers stands at 600 million+, growing at a CAGR of 60% (Refer Figure 13). The mobile phone penetration stands to touch 100% by the year 2015 (Refer Figure 14).

Figure 11: Number of TV Viewers in India

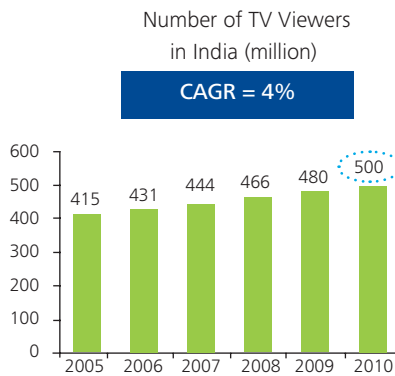


Figure 12: Number of PC users in India

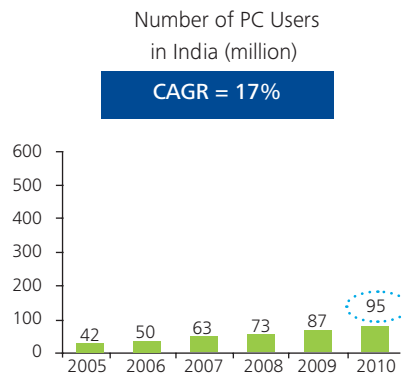
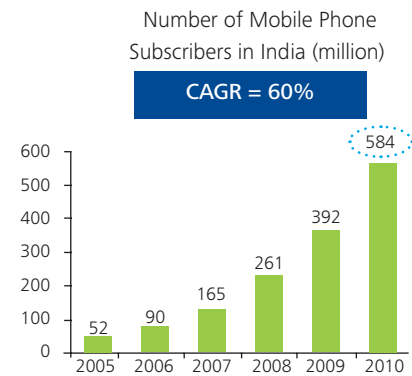
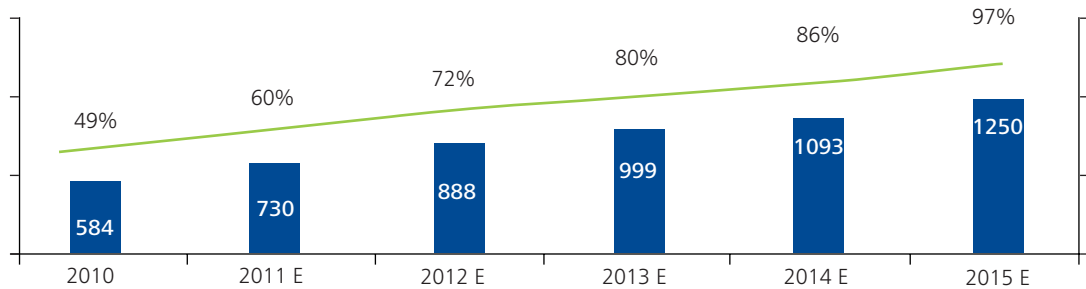


Figure 13: Number of mobile phone subscribers in India



Note: India had approximately 670 million mobile phone subscribers in August '10
Source: TAM, IAMA Report, Economic Times, TRAI, IAMA-IMRB Survey

Figure 14: Mobile phone penetration in India



Source: TRAI

A combination of nearly 100% mobile penetration in India and spiralling mobile customer base makes mobile phones the perfect medium to enable non-cash retail transactions in India.

Critical Success Factors

Any mobile phone solution for non-cash retail transactions needs to have certain basic characteristics to succeed, such as:

- Mass Reach: The solution must be adopted by small traders, delivery agents etc. for whom transaction volumes or values are low for supporting credit card and similar non-cash payment mechanisms

- Secure: Must be compliant with RBI guidelines for end-to-end encryption, fraud protection, etc.
- Service Provider Agnostic: Solution must not be linked to a particular service provider
- Convenient/Easy: Payment through mobile phones must be convenient, easy, and faster compared to cash and other non-cash payment mechanisms
- Low set-up costs & time: Effort required and the cost of set-up has to be much lower compared to traditional PoS
- No/little requirement of additional infrastructure: Ecosystem required should be primarily set-up based on the existing wireless telecom infrastructure and

the current mobile phones used by customers and merchants

- Competitive pricing with existing methods: Pricing needs to be competitive with other non-cash payment mechanisms

Given the specific conditions and critical success factors required for the success of mobile payments in India, there is a need for a customized mobile payment solution which does not just ape the West or is extremely influenced from any other country based on its initial success outside India.

Multiple models of mobile payments that can be adopted are prepaid instruments where the balance is

credited before the purchase by a top-up transaction, direct debit where the bank account is directly debited for the purchase, and the post-paid wallet where it is either linked to a credit card or a mobile account and the customer has to pay for the purchase at the time of settlement with the credit provider.

A comparison of these three mobile payment modes indicates that the prepaid option is the best suited for Indian conditions (Refer Table 2)

A solution which meets the above critical success factors has the potential for succeeding as an effective mobile payment instrument in India.

Table 2: Comparison of different modes of mobile payments

	Prepaid	Direct Debit	Postpaid
Description	Pre-loaded with desired amount	Linked to bank a/c for real-time debit	Linked to credit card or mobile a/c
Benefits	+ Avoids exposure of bank a/c or credit card information + Credit check etc not required	+ No recharge activity required	+ No recharge activity required
Drawbacks	- Recharge activity required	- Exposure of full bank a/c	- Credit risk borne by bank/operator



IMPS – A Public Sector Initiative

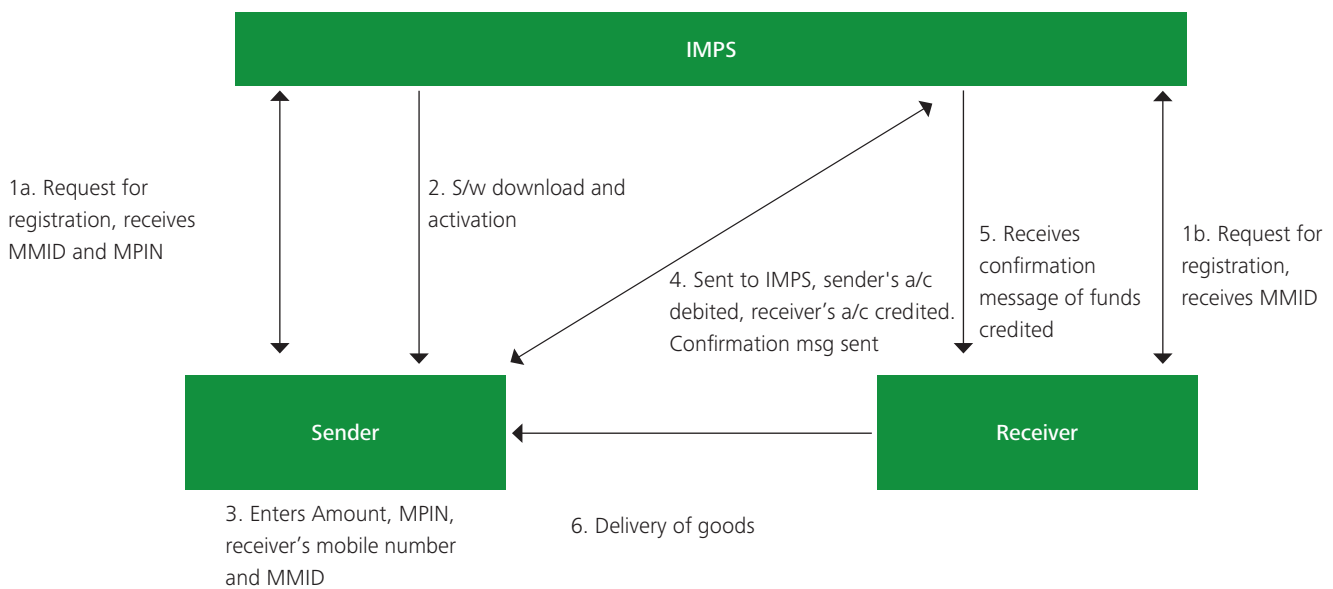
The Interbank Mobile Payment System (IMPS) has been developed by the National Payments Corporation of India (NPCI) to expand the scope of mobile payments to all sectors of the population. IMPS offers an instant, 24X7, interbank electronic fund transfer service through mobile phones.

To enable the transfer of money, both the sender and the receiver of payment have to link their bank accounts with their phone numbers through their respective banks. The sender has to register for mobile banking service with her/his bank. Upon registration, the bank will provide a link to the mobile banking software which needs to be installed in the mobile phone to enable

payments. Both the sender and the receiver will receive a Mobile Money Identifier (MMID) while the sender will also receive a Mobile PIN (MPIN) for authentication of transactions.

While transacting, the sender has to input the MPIN, receiver's mobile number and MMID, and the amount of funds to transfer. IMPS will authenticate the sender, check the receiver's mobile number and MMID, and transfer the funds to the receiver's account in real-time. Both the sender and the receiver receive messages notifying them about the success or failure of the transaction. Another mode of payment that can be used is via the SMS.

Figure 15: Steps of the IMPS solution



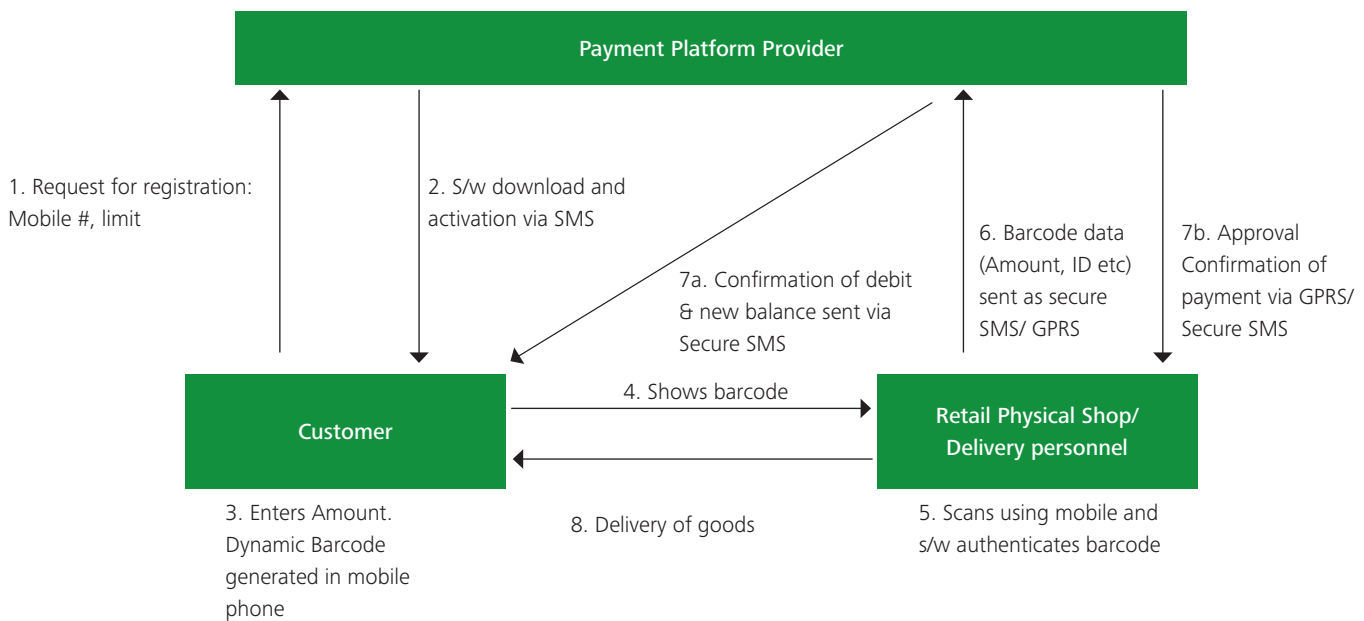
While IMPS is currently focused on Person-to-person payments and money transfer, it can be extended to retail payments.

A Sample Solution from the Private Sector

eMudhra, a firm based out of Bangalore, has come up with one such solution, which meets the current challenges of the ecosystem, at least at a conceptual level. This prepaid solution is modelled on the credit card model, featuring the lead bank, the acquirer bank, and the issuer bank. The lead bank will be the entity running the payment eco-system and solution platform. The lead

bank also controls customers' and merchants' information; and manages the enrollment of other consortium members – issuer banks, and acquirer banks. The issuer bank will market the product to the customers and approve their enrollment. The acquirer bank will market the product to merchants and also enroll them, sign legal contracts, and provide current account facilities.

Figure 16: Steps of a model solution from the private sector



The three bank types are actually roles that any entity can play. For example, a lead bank can also take the role of an issuer bank which means it can also market the product to its customers. Or any single bank can take all the three roles, maintaining a tight control over the whole ecosystem.

This prepaid solution will enable customers to do top-ups, similar to mobile talk-time recharges and to credit money to their 'mobile wallets'. This amount can

be as high or as low as the customer desires, based on his or her purchasing behaviour, and risk perception in case of loss of the mobile phone. This solution helps avoid exposing the customer's entire bank account limiting the damage caused in case of theft of the mobile phone. Also it gives the customer full control over the balance in his mobile payment account, which can be kept zero if the account is not going to be used for long periods of time.

This mobile payment process is divided into three distinct modes which are outlined below:

Registration	Payment	Recharge
<p>This will be a one time activity and needs to be done by both the customer and the merchant. After presenting a registration request to their banks, and authenticating themselves, a link will be sent containing the mobile application to be installed on their devices. Once this is installed, a mobile account will be created, and they will be asked to choose a PIN to restrict access to the mobile application</p>	<p>When the user wants to pay, he or she will access the mobile payment application by entering the PIN and the required amount to be paid. The customer's device will then generate a unique bar-code which can be read by the merchant's mobile phone through its camera. The code will have details about the customer, the amount to be transferred, time of transfer, place, etc. These details will be sent by the merchant's mobile phone in an encrypted fashion to a central server from where the funds will be debited from the customer's prepaid account and credited to the merchant's account. Confirmation messages will be sent to both the customer and the merchant</p>	<p>Customers can credit their prepaid account by transferring funds from a bank account, or through their credit/ debit cards. This process can be done online from any internet enabled terminal, or by visiting any of the bank branches or ATMs</p>

We believe the above solutions overcome many of the inadequacies currently encountered in other non-cash payment systems. Such solutions need a tightly knit vast ecosystem to ensure large penetration and usage.

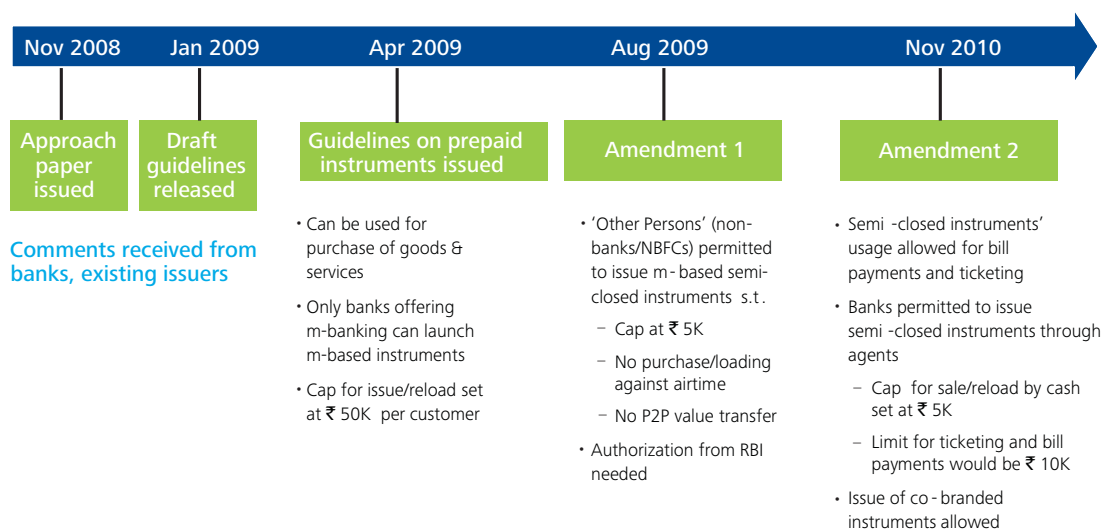


The Road Ahead

Given that mobile payments is the future of non-cash payment mechanisms in India, adequate steps need to be taken to tap this vast opportunity. This wave of mobile money momentum, if facilitated by regulation and right business model, has the potential to revolutionize the payment system. Stakeholders involved in the development of the mobile payments ecosystem are the regulatory authorities (RBI), network operators, financial institutions, and technology providers.

RBI has already taken multiple steps in this regard by issuing guidelines for pre-paid instruments in the country (Refer Figure 17). The regulator has allowed non-banks to issue mobile payment instruments to the end users. The daily limits set for mobile transactions have also been increased in the latest amendment to the guidelines.

Figure 17: RBI guidelines on pre-paid instruments



A plethora of technologies for mobile payments are available in the market from domestic and foreign players. With the growing support of the regulator and availability of technology, it is advisable for other stakeholders to focus on innovating mobile payment solutions, which are customized to the Indian market and have a mass appeal.

Players who identify this opportunity, and leverage available technologies and regulations to carve out mobile retail payment solutions that are suitable to the Indian marketplace are set to emerge leaders in this space, leaving others behind.

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