"BANKING ON TECHNOLOGY – NEW PARADIGM IN INDIAN BANKING''

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Abstract: *Technology has helped in improving the efficiency of the financial system and is being viewed as an excellent tool for providing a fairly exhaustive range of electronic products and extending banking facilities to the vast multitude of population. From cash to contactless payments to mobiles money in order to bring in transparency and efficiency in the Payment system, it is journey every government in the world undertakes. Payment systems in India till recently have been the domain of banks. With the legislation of Payment and Settlement System Act, 2007 (PSS Act) the arena has been opened up for entry of non-bank entities. Currently 31 non-bank entities have been permitted to operate payment systems such as issuance of pre-paid payment instruments, providing cross-border in-bound money transfer, cards payment network and ATM networks. Money transfers using mobile banking and immediate payment system (IMPS)–wherein money is transferred instantly using text messaging or online banking–showed the highest increase in over 12 months ending October 2016. Mobile banking transactions grew 175%, while money transacted using mobile banking grew 369%which reflects increasing usage of electronic payment systems.*

This Paper examines how technology has played an important role in opening the new banking paradigms - The development of efficient and secure Payment System and continuous evolving till it creates checkless, cashless society with wireless technology as a last mile and reaching to the unbanked people and areas. Payment System is a backbone of any financial economy. The spectacular growth in financial transaction has necessitated certain radical changes in the payment and settlement systems around the globe.

Keywords: Digital Banking, Payment System, IMPS , Financial Inclusion , PMJDY

Introduction

Electronic Banking and Payment System has become an important practice among commercial banks in India and worldwide. It is recognized worldwide that an efficient payment system is enabler of economic activity and technology has played an important role in the evolution of new age payment systems. The introduction of this electronic banking has improved banking efficiency in rendering services to the customer. It was in line with this study that aims at examining the impact of electronic banking system. The design of payment system has important implications for the conduct of monetary policy, the soundness of financial firms and the functioning of economy as a whole. Technology has helped in improving the efficiency of the financial system and is being viewed as an excellent tool for providing a fairly exhaustive range of electronic products and extending banking facilities to the vast multitude of population. From cash to contactless payments to mobiles money in order to bring in transparency and efficiency in the Payment system, it is journey every government in the world undertakes.

Reflecting the need for technologically advanced, secure, efficient, accessible payment and settlement systems, the Reserve Bank persisted in its endeavor to incentives electronic modes of payment. Enhanced use of prepaid payment instruments and mobile phone based payment services have been promoted with adequate security measures in place. Driven by the objective of reinforcing RBI as a knowledge hub, the bank has striven towards strategic use of IT and its applications.

In a system of inter-woven financial and international economic linkages, an efficient payment and settlement system is paramount. In the Indian set-up with an enormous spread of banking and non-banking financial institutions and other financial organizations, ensuring adequate payment and settlement structures with strong security measures to harness efficacy assumes critical significance and hence is yet another unique responsibility of the Reserve Bank.

The positive impact of technology in the transformation of banking across the globe has enabled banks to take on the challenges unleashed by various external forces such as competition, globalization, shrinking margins, and internal forces such as relating to human resources and need for changes in the procedures. The term Payment systems refers to the instruments, organizations, operating procedures, participants, standards, rules and guidelines, information and communications and technological support, used to initiate and transmit payment information from payor to payee and settle payments – i.e. transfers of money between.

The banking industry of the 21st century operates in a complex and competitive environment characterized by these changing conditions and highly unpredictable economic climate.

Technology has 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. All the stakeholder have benefited from the expansion of delivery channels, product innovation, and efficiency enhancement which have been facilitated by technology adoption.

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The changing role of technology from supporting business to a major driver is creating a sustainable differential advantage as the customer`s expectation is also rising. The combined power of these three drivers of industry change – technology, customers and regulation – is increased by the fact that they are often closely interwoven. For example, technological change creates new categories of customer utility, which in turn fuel further technological investment.

Banks, however, need to guard against losing personal touch with their customers in such technology driven environment as this would result in their losing valuable information needed for their business. Overall, technology that began its journey in Indian banking as an enabler, has now become a business driver, and is poised to be an inseparable part of the banking business process. This journey has come to the present stage by virtue of the push given by the Reserve Bank of India and the whole hearted co-operation by Industry participants.

This paper examines how technology has played an important role in opening the new banking paradigms. The development of efficient and secure Payment System is continuous evolving till it create checkless, cashless society with wireless technology as a last mile and reaching to the unbanked people and. Payment System is a backbone of any financial economy. The spectacular growth in financial transaction has necessitated certain radical changes in the payment and settlement systems around the globe.

Growth Story And Developments of Payment Systems In India

- Some of the important developments that have taken place in the area of payment system in India under the guidance and oversight of Reserve Bank of India.
- Introduction of MICR clearing to mechanise the cheque clearing system in early 1980s.
- Setting up of the Institute for Development and Research in Banking Technology (IDRBT) in 1996 with an aim of technological upgradation and development of a reliable communication network.
- Introduction of Electronic Clearing Service and Electronic Funds Transfer in the 1990s.
- Permitting issuance of Credit and Debit cards by the banks in 1990s.
- Interconnectivity of ATMs across the country by introducing the National Financial Switch in 2003.
- Following the improvement in the Information Technology and Introduction of CBS by banks, RTGS and NEFT introduced by RBI in 2004
- Introduction of Cheque Truncation System (February 2008) and new RTGS with enhanced features (October 2013).
- The second factor authentication for the 'card not present' transaction, the first of its kind in the world, introduced by RBI (February 2009.)
- Launch of RuPay – a domestic card payment network (March 2012)

Customers don't use channel or products in isolation of one another. Everyday customers would interact with banks in various ways. They might wire money to a third party, visit ATM to withdraw cash, go online to check salary credit, pay an utility bill, use their credit card to purchase some goods from a retailer , fill out a personal loan application online, ring up the call centre to see what their credit card balance is or report a lost card. More sophisticated they are, they may also trade some stocks, transfer some cash from their Euro A/c to USD a/c put up a lump sum in a Mutual Fund or sign up a home insurance policy online".

New banking paradigm – merging role of payment systems

The RBI`s Payment System Vision Document 2015 has a swot Analysis. Safe, secure and efficient payment systems are vital for the working of financial markets and more generally for the economy itself. Any disruption to the payment system has the potential to disrupt the functioning of the financial markets and lead to systemic instability. Such large scale disruption probably we have in mind the bigger and systemically important payment infrastructure and larger payment system members, viz. Financial Institutions, Exchange Settlement System, Central Counter Parties and so on. At the other end of the spectrum, the payment system has to also serve the retail customers. In that sense, the payment systems also have an inclusion mandate so that the day to day needs of the people like remittance of funds and small value payments are met. It is also important to emphasize here that the Central Bank and the Government are also interested in weaning people away from cash and induce them to use cashless mode of payments like card, mobile, direct debit etc.

<u>Entry of non-banks in payment systems</u>:

Payment systems in India till recently have been the domain of banks. With the legislation of Payment and Settlement System Act, 2007 (PSS Act) the arena has been opened up for entry of non-bank entities. Currently 31 non-bank entities have been permitted to operate payment systems such as issuance of pre-paid payment instruments, providing cross-border in-bound money transfer, cards payment network and ATM networks. The entry of non-bank entities has the potential to change the payment system landscape as these entities can leverage on their product offerings with latest technological features to cater to wide segment of the market. Of course the Reserve Bank has laid down appropriate guidelines and safeguards to protect the customers' financial and other interest and promote orderly growth in the markets. Entry of non-bank entities will promote competition and thereby provide more choice to the customers.

Important Role of Payment Systems In Promoting Financial Inclusion

The role of payment system in promoting financial inclusion. There is a strong linkage between financial inclusion and the payment systems. The financial inclusion in its simplest form refers to banking inclusion where the endeavor is to link the unbanked population with the formal banking system by opening their bank accounts. To inculcate the banking and savings habit amongst the people, it is important that all individuals have bank accounts where funds could be held - which initially could be through remittances in form of direct benefit transfers under the Central /State Government schemes. Ernst and Young had come out with a report which lists 6 key elements that make up the financial inclusion agenda of the country.
The PMJDY scheme launched by the Government of India has achieved stupendous success in linking the unbanked with the banking system. Bank accounts have been opened for nearly 99.99 per cent of the households in India which has brought in 16.43 crores new customers coming into the banking system fold while nearly 14.67 crores RuPay debit cards have also been issued as on 24.06.2015. These are huge numbers on a standalone basis and the payment system must be geared to handle this multi-fold increase in transaction volume. The payment system would need to be robust enough to process, settle and reconcile millions of new transactions day in and day out

Aadhar Enabled Payment System

The unique identity number (Aadhar) has become an important driver of financial inclusion initiatives. Aadhaar provides a unique identification valid through the country when integrated with payment system application has the potential to shape the payment system future in the country.

NPCI and UIDAI in partnership are ushering in the Aadhar enabled payment system (AEPS). AEPS is a bank led model which allows online financial inclusion transaction at PoS (MicroATM using handheld device) through the business correspondent of a bank using the Aadhaar authentication. At present AEPS service can be availed by customers at their respective bank business correspondent outlets. AEPS will support four types of banking services viz. balance enquiry, cash withdrawal, cash deposit and Aadhaar to Aadhaar funds transfers. UIDAI along with NPCI has piloted Aadhaar enabled Payment System in Jharkhand.

Basic transactions permissible over these accounts include cash deposit, cash withdrawal, balance enquiry, and inter-bank money transfer. This system also envisages the creation of an Aadhaar Enabled Payment Bridge which would facilitate direct disbursement of government benefits to the beneficiary by credit to their bank accounts using Aadhaar.

RRBs in the payment system fold

The Report of the Working Group on technology up gradation of Regional Rural Banks, set up by RBI in 2008, recommended that as a matter of policy, all RRBs should begin moving towards CBS and achieve 100% coverage by September 2011. Currently, 45 out of 82 RRBs have achieved 100% CBS status, and the remaining are in various stages of implementation.

CBS enabled RRB opens up immense possibilities in terms of products and services. As a first step, the sponsor banks would need to integrate the CBS of RRBs with their own Core Banking. This would enable the customers of RRBs to enjoy the same benefits of anywhere and anytime banking and the use of multiple payment delivery channels such as RTGS, NEFT, ECS, ATMs, internet, telebanking, mobile and SMS banking etc. On 5th May, 2015, Parliament passed two bills which seek to help regional rural banks raise their authorized capital and bring India's banking payment system in sync with international practices.

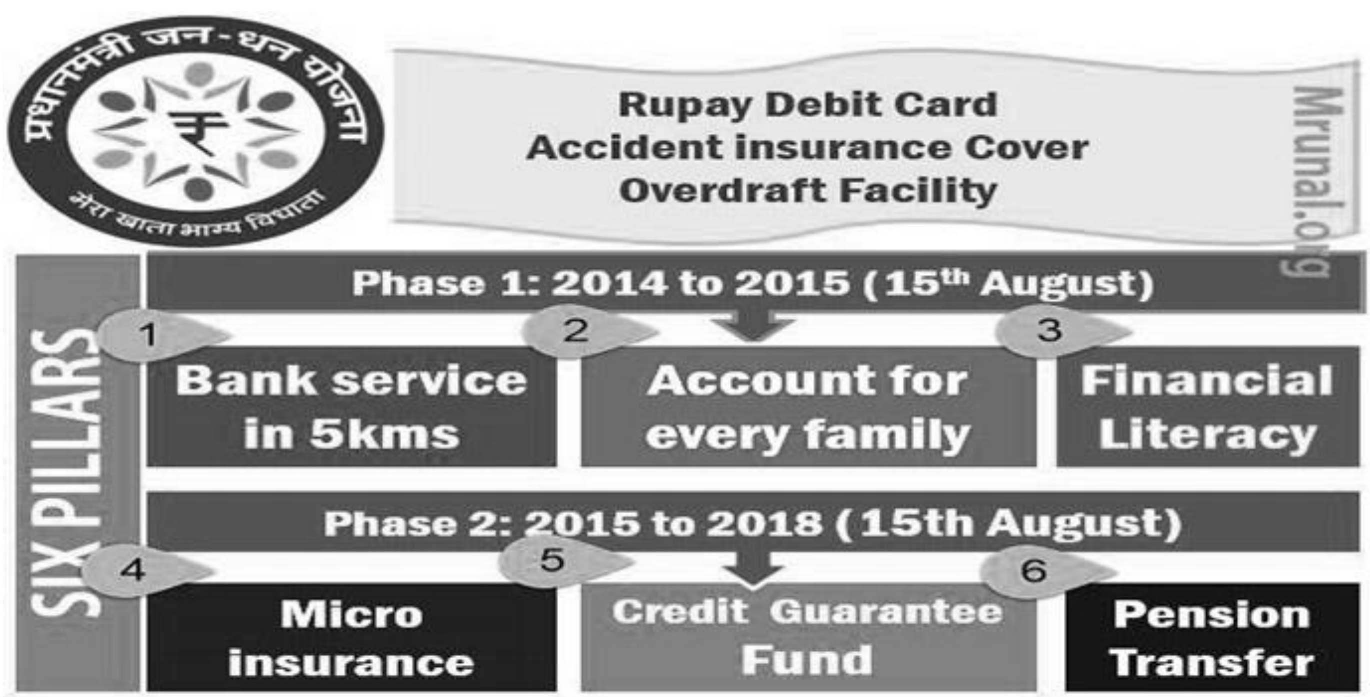
The Payment and Settlement Systems (Amendment) Bill, and the Regional Rural Banks (Amendment) Bill were passed by the Lok Sabha last year and the Rajya Sabha a few days ago since the two bills were moved last year; the Rajya Sabha amended them by changing their year from 2014 to 2015.

Liberalized business correspondent (bc) guidelines

BC guidelines have been significantly liberalized with corporate including MNOs having been allowed to come in as BCs. The banks are also now permitted to pay a reasonable commission/ fee to the BC. It is hoped that these liberalized guidelines would result in expansion of the banking coverage and along with technology provide a sustainable ecosystem for the unbanked and financially excluded segments of the population to be part of formal banking network.

Financial Inclusion- Untapped market

The financial inclusion should be seen not only as a social responsibility but also as a potential business model because of the huge untapped market that it seeks to bring into the fold of banking services. In India almost half the country is unbanked. Of the 6 lakh villages in India, the total number of villages with banking services stands at less than 1 lakh villages as at end March 2011. India has a highest number of households (approximately 145 million) who are excluded from banking. Thus this 'bottom of the pyramid' which comprises a huge section of the Indian population presents a large untapped market with a tremendous business potential. Therefore, the banks in India need to devise appropriate strategies for tapping the banking value that is represented by these large number of households at the bottom of the pyramid.



Pradhan Mantri Jan - Dhan Yojana (Accounts Opened As on 24.06.2015)

Disclaimer: Information is based upon the data as submitted by different banks/SLBCs

(All Figures in Crores)

S.No		No Of Accounts			No Of Rupay Debit Cards	Balance In Accounts	% of Zero Balance Accounts
		Rural	Urban	Total			
1	**Public Sector Bank**	**7**	**5.82**	**12.82**	**11.95**	**14640.22**	**52.03**
2	**Rural Regional Bank**	**2.5**	**0.43**	**2.93**	**2.11**	**3315.65**	**51.88**
3	**Private Banks**	**0.4**	**0.28**	**0.68**	**0.6**	**1059.56**	**48.53**
	Total	**9.9**	**6.53**	**16.43**	**14.67**	**19015.42**	**51.86**

PMJDY Phase-I Data (as on 31-Jan-2015)

Figure 1: Source www.pmjdy.org.in – Progress Report

*Sources: * Census 2011; ** RBI Basic Statistical Returns 2012; ^in metropolitan cities*

Increasing trends -volume and value of payment system transactions

Figures have gone up in recent years. In volume terms, the no. of transactions handled in the RTGS has gone up to 92.78 mn as at the end of March 2015 from 68.51 mn as at the end of March 2013. During the same period, in value terms, these transactions have gone up from Rs.677 tn to Rs.754 tn. Under the retail payments (including paper clearing and retail electronic clearing), the volume handled more than doubled from 694 mn as at the end of March 2013 to 1687 mn as at the end of March 2015. Similarly, in value terms also, this has more than doubled to Rs.65 tn from about Rs.32 tn. Further, the volume and value of card payments have also more than doubled in both volume and value terms during this period. The volume handled as at the end of March 2015 was 1737 mn transactions with a value of Rs.3.3 tn. These numbers are mighty impressive considering the level of economic development in the country but as I mentioned earlier, there is much more work needed to be done going forward. We need to develop the capabilities to handle more and more number of transactions in a safe, secure and efficient manner, if our objective of weaning consumers away from cash has to be achieved.

Several initiatives for infrastructure enhancements are currently on which include implementation of Trade Receivables and Discounting System and the Bharat Bill Payment System. RBI had come out with a Vision Document for 2012-15 earlier and most of the objectives set out therein have been accomplished. The vision of RBI is to ensure that all 'Payments and Settlement Systems in the country are safe, efficient, interoperable, authorised, accessible, inclusive and compliant with international standards". RBI has also initiated the process of setting up of Payment Banks to further financial inclusion.

New game , new rules – evolving prepaid instruments landscape in India : Although prepaid market represented only 3.62% of the Indian card market , this will increase dramatically over the right decade. Increasing trends of volume and values of Payment systems in 2014-2015 is reflected in the following figures.

Payment System Volumes 2014-2015 in Million (Rupees)	
RTGS	**92.78**
CCIL Operated System	**3.03**
Paper Clearing	**1196.51**
Retail Electronic Clearing	**1687.44**
Cards	**8423.99**
Prepaid Instruments	**314.66**
Mobile Banking	**171.92**

Cards Outstandings	**574.56**

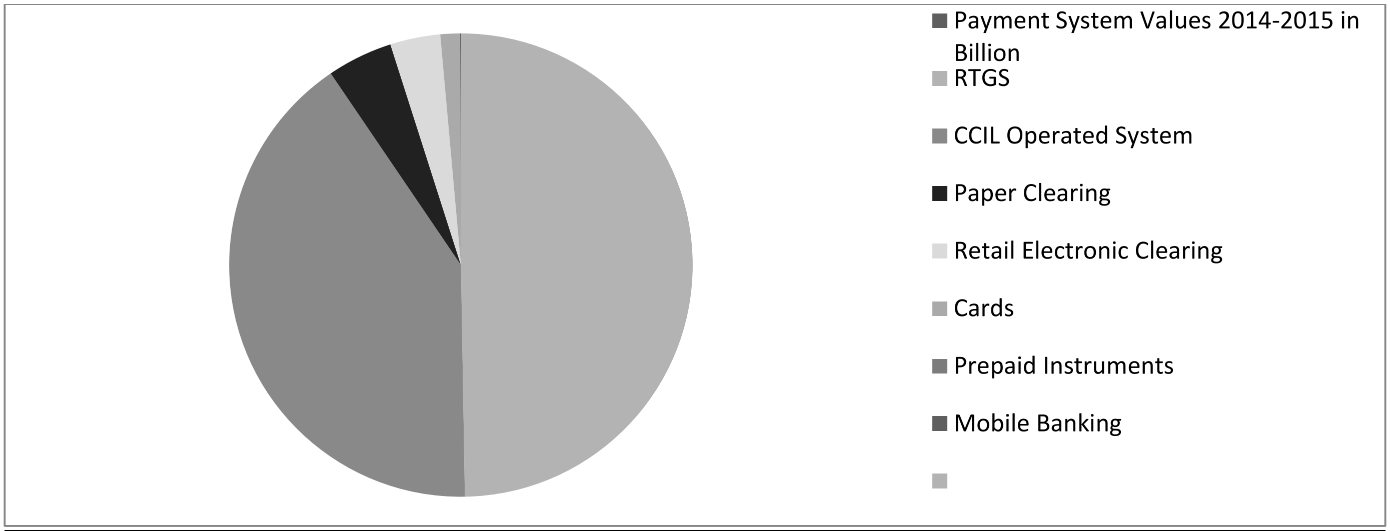


Figure 2 : RBI Journal June 2015 Payment System Volumes in Million (Rupees)

Payment System Values 2014-2015 in Billion (Rupees)	
RTGS	**929332**
CCIL Operated System	**762000**
Paper Clearing	**85434.14**
Retail Electronic Clearing	**65365.51**
Cards	**25415.27**
Prepaid Instruments	**213.42**
Mobile Banking	**1035.3**

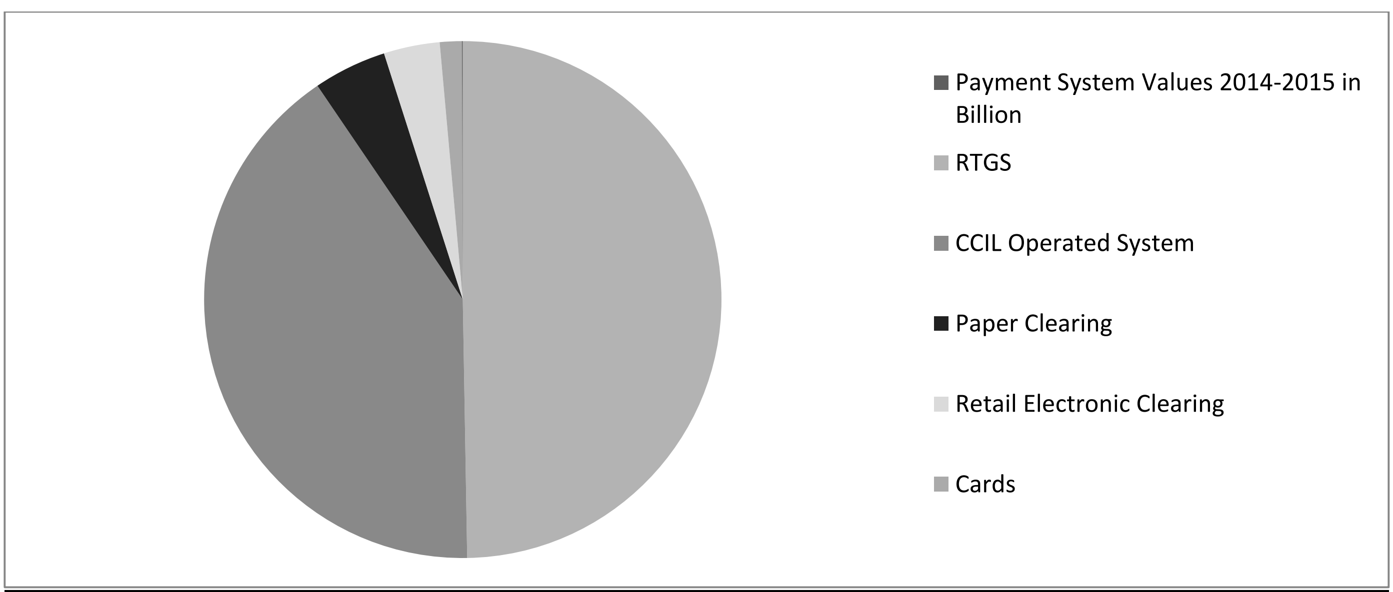


Figure 3 : RBI Journal June 2015 – Payment System Values in Billion (Rupees)

PAYMENT & SETTLEMEENT SYSTEM VOLUMES FEB - MARCH 2015 (Rupees)			
	JAN	**FEB**	**MARCH**
RTGS	**7.69**	**9.67**	**7.9**
CCIL Operated System	**0.23**	**0.27**	**0.23**
Paper Clearing	**93.66**	**102.8**	**94.37**
Retail Electronic Clearing	**208.98**	**242.07**	**211.4**
Cards	**688.21**	**757.66**	**753.85**
Prepaid Instruments	**30.31**	**54.1**	**74,36**
Mobile Banking	**18.53**	**19.67**	**19.75**

Figure 4: RBI Journal June 2015 – Payment Systems volume Feb –March 2015

Setting up of national payment corporation of india

- NPCI was set up with an objective of ensuring pan-India payment systems with uniform business processes and standards and has already created an enabling eco system necessary for handling this huge task. Some of the achievements of NPCI which have significantly altered the retail payments landscape in the country are as under:
- The National Financial Switch (NFS), a vast network of ATMs, has enhanced accessibility to cash withdrawal and other basic banking facilities for customers, besides facilitating value added services such as bill payments.
- Cheque Truncation System (CTS) - It has been rolled out successfully in three grid locations across the country covering over 85% of cheque volume processed. NPCI has now begun to facilitate the repository of images of cheques processed in CTS.
- Immediate Payment Service (IMPS) which started in October 2010 as an inter-bank mobile payment system has, over the years, transformed into a multi-channel 24x7 remittance platform in the country, accessible through net banking, mobile banking, at BC point, at branches as well as at ATMs.
- RuPay - the domestic card system which was launched in 2011 has slowly gained popularity and with its linkage under the Jan DhanYojana has become a household name.
- Aadhaar based payments, through linkage of biometric identifier with bank accounts, is facilitating the benefit payments to bank accounts of millions of beneficiaries, and will have significant on financial inclusion efforts in the country.
- National Unified USSD Platform (NUUP) – The setting up of National Unified USSD Platform for providing an interoperable USSD based mobile banking system is an unparalled feat in itself as it links all telcos and all major banks, and offers services in over 11 languages. It has a lot of expectations as well as its potential for enabling financial inclusion is enormous.

The above are some of the milestones in the journey of NPCI thus far. NPCI is geared up to handle the huge volume of payments arising out of recent initiatives of the Government to distribute social benefits to the citizens in the electronic mode.

PMJDY Uniform Card Design

h	Transactions Presented		Transactions Returned		Final Credit	
	Volume (Nos.)	**Value (Rs.)**	**Volume (Nos.)**	**Value (Rs.)**	**Volume (Nos.)**	**Value (Rs.)**
April, 2014	618,566	759,580,562.30	110,219	74,000,328.89	508,347	685,580,233.41
May, 2014	690,511	479,020,991	49,669	36,794,558	640,842	442,226,433
June, 2014	157,041	383,867,099	22,229	15,828,840	134,812	368,038,259
July, 2014	524,787	708,710,624	39,544	29,853,835	485,243	678,856,790
August, 2014	375,963	344,050,966	36,454	25,205,006	339,509	318,845,960
September, 2014	401,969	323,883,584	16,224	11,707,591	385,745	312,175,993
October, 2014	343,341	642,236,963	27,056	21,486,388	316,285	620,750,575
November, 2014	3,551,546	1,793,041,644	30,633	18,233,806	3,520,913	1,774,807,838
December, 2014	10,744,284	4,625,059,807	37,767	18,409,434	10,706,517	4,606,650,373
January, 2015	48,815,570	20,754,559,798	659,274	287,816,834	48,156,296	20,466,742,964
February, 2015	50,969,339	15,789,597,095	231,444	77,304,593	50,737,895	15,712,292,502
March,2015	52,661,418	15,495,029,564	160,165	51,160,982	52,501,253	15,443,868,582
Total	**169,854,335**	**62,098,638,698**	**1,420,678**	**667,802,196**	**168,433,657**	**61,430,836,502**

Figure 5: Source www.npci.org.in-Aadhar Payment Bridge Systems Anaytics 2014-2015

Global success stories and its replication in india

There are many success stories within different geographies across the globe in the arena of payment systems. To mention a few – the m-pesa system of Kenya, the 'tap and go' card scheme at Singapore, the union pay card scheme of China. If these models have worked so well and have been so successful in their respective countries, India needs simply to replicate the model in our jurisdictions.

India is diverse - in the sense of social customs, culture, religious beliefs. The diversity and multitude of population and geographic spread of the country are some factors which make our task extremely complex. The ease with which people can handle technology also differs across people of different age groups, income levels, literacy levels etc. Hence, it is difficult to design product which can work seamlessly across all sections of the society. Thus, while it is true that no scheme or model can work seamlessly across all economies; what might indeed be best is learn from the other successful delivery models and customise the product and service offerings to suit the DNA of the respective economy and society.

Impact of technology onpayment systems

Growing mobile and internet penetration has opened new avenues for the payment systems services. This is reflected in the way the new age customer transacts her business. To quote Brett King, the author of 'Bank 3.0':

"Customers don't use channel or products in isolation of one another. Everyday customers would interact with banks in various ways. They might wire money to a third party, visit ATM to withdraw cash, go online to check salary credit, pay an utility bill , use their credit card to purchase some goods from a retailer , fill out a personal loan application online, ring up the call centre to see what their credit card balance is or report a lost card. More sophisticated they are, they may also trade some stocks, transfer some cash from their Euro A/c to USD a/c put up a lump sum in a Mutual Fund or sign up a home insurance policy online".

The above statement denotes the diverse set of banking applications which technology can support. In fact, there is a need of a single channel solution to multiple product offerings. It must, however, be remembered that technology is just an enabler. Almost all banks in India have invested heavily in web-based and mobile-based delivery banking and payment solutions. Very often, these channels are supported by different vendors and also one use different technology which increases complexity and involves cost. Technology is ever evolving and adoption of new technology for staying contemporaneous is a costly proposition. It is pertinent, therefore, that all the capabilities of the technology enabled delivery solutions are optimally exploited, so that we are not saddled with unproductive investments.

While there is a lot of euphoria around the adoption of mobile banking and mobile payments, the model has been relatively less successful barring a few countries where the right environmental factors existed. The delivery of financial and payment services by using the mobile device rather than its use as an access channel for internet banking etc. In the Indian context, an objective analysis would reveal various reasons for slow adoption. There are technical issues like type of handsets, variety of operating systems, encryption requirements, inter-operable platforms or the lack of it, absence of standardised communication structures, difficulty in downloading application, time lag in activation etc. These get accentuated by the operational difficulties in on-boarding merchants and customers and customer ownership issues. The interplay of these factors has stymied the deployment and adoption of mobile banking as an effective and widely accepted delivery channel. Issues of coordination and cooperation between banks and telecoms, is another aspect which acts as either a driver or a barrier to the adoption of mobile banking. These issues need to be quickly resolved if the mobile payments have succeed in our country

Banks are on a spree to introduce and upgrade technology to cater to the increasing customer base and needs. However, the issue the technology adoption and absorption in banks need a closure look whether it is holistic in nature or it is in disjointed and disarray mode. I have already drawn your reference to the need for payment system convergence in banks.

Technology trends- The new technology trends such as cloud computing, mobile telephony and Service Oriented Architecture (SoA) etc are likely to bring about significant changes in the way payments would be processed in the future.

The Mobile telephony is pervasive and ubiquitous with close to 850 million[6] subscribers (as on June 30, 2011) and is expected to have 97% tele-density by 2015 (TRAI source). With high tele-density, introduction of smart phones, new technology such as 3G, innovative mobile payment solution providers mobile telephony is well poised to emerge as retail payment instrument of the future in terms of costs, convenience, speed and reach. The ASSOCHEM and Deloitte report 'Mobile Payments in India New frontiers of growth' April 2011 identifies the critical factors viz. mass reach (across small distributors, traders and delivery agents), security, service provider agnostic, ease and convenience of operation, leverage on existing infrastructure and competitive pricing as critical factors for the success of mobile payments in India. The future of mobile payments in India will to a large extend depend on convergence of business models of banks, telecom operators and other stake holders.

Another technology which in conjunction with mobile phone is likely to drive the future payment mode is NFC. NFC, or near field communication, enables the exchange of data between devices in close proximity to each other. Use of NFC as a future payment technology is gaining attention worldwide with many technology providers notably among them Google are experimenting with this technology. NFC is quite successful in countries like Japan. In India there have been a few test runs with NFC payments but products are yet to be rolled out. Challenge with NFC is finding an ideal solution to host multiple cards in the same NFC handset. Further, use of NFC would require changes in payment processing, upgrading the PoS terminals at the merchant ends.

Month	Presentment Cheque Volume (in Lakh)	Presentment Cheque Value (INR Lakh)	Return Cheque Volume (in Lakh)	Return Cheque Value (INR Lakh)	Return Cheques as % of Total Presentment Cheque Volume
Apirl 2015	201.53	17,250,236.09	9.43	921,031.49	4.68%
May 2015	195.02	16,329,561.48	8.77	884,908.68	4.50%
Total	**396.55**	**33,579,797.57**	**18.21**	**1,805,940.16**	**4.59%**

Figure 5: Source www.npci.org.in – Northern Grid Cheque Truncation System –Value and Volume Report

Immediate Payment Services (IMPS)

Currently majority of interbank mobile fund transfer transactions are channelised through NEFT mechanism. Under NEFT, the transactions are processed and settled in batches, hence are not real time. Also, the transactions can be done only during the working hours of the RTGS systemWith the above context in mind, NPCI conducted a pilot study on the mobile payment system with the banks like SBI, BOI, UBI and ICICI in August 2010. Also the banks like Yes bank, Axis and HDFC bank joined this league in the month of September, October and November 2010 respectively. Immediate Payment Service (IMPS) public launch happened on 22nd November 2010 by Smt. Shyamala Gopinath, DG RBI at Mumbai and this service is now available to the Indian public. IMPS offers an instant, 24X7, interbank electronic fund transfer service through mobile phones. IMPS is an emphatic tool to transfer money instantly within banks across India through mobile, internet and atm which is not only safe but also economical both in financial and non-financial perspectives.

This facility is provided by NPCI through its existing NFS switch. Increasing trends both in volumes and values are reflected in blow figures.

o. of Member Banks	No. of MMIDs Issued (in lacs)	Inter Bank Volume		Intra Bank Volume		Total No. Transaction	Total	
		No. of Transactions	Amount (₹) (in lacs)	No. of Transaction	Amount (₹) (in lacs)		Amount (₹) (in lacs)	
May, 2015	92	898.92	13,324,315	1067532.91	1,312,669	34109.05	14,636,984	1101641.96
April,2015	84	849.54	12,366,275	1008917.63	1,176,465	46044.98	13,542,740	1054962.61
March, 2015	81	800.13	12,019,719	941469.52	1,074,236	37594.16	13,093,955	979063.68
February, 2015	76	758.01	10,078,559	759081.97	984,606	37318.54	11,063,165	796400.51
January, 2015	74	743.16	9,325,235	697261.97	971,553	36485.51	10,296,788	733747.48

December, 2014	73	745.57	8,380,921	603655.48	1,121,502	30621.86	9502423.00	634277.34
November, 2014	71	704.99	7,090,697	525901.11	720,531	15659.04	7,811,228	541560.15
October, 2014	71	685.01	6,508,147	489880.15	327,618	20501.33	6,835,765	510381.48
September, 2014	69	670.25	5,862,292	429463.76	307,689	18503.53	6,169,981	447967.29
August, 2014	67	632.34	4,797,349	351974.01	259,487	15818.38	5,056,836	367792.39
July, 2014	65	629.71	4,260,701	301864.46	236,333	17775.67	4,497,034	319640.13
June, 2014	63	618.96	3,706,309	261005.6	195,556	13543.81	3,901,865	274549.41
May, 2014	62	606.28	3,296,212	241600.27	194,638	12130.89	3,490,850	253731.16
April, 2014	60	595.21	3,114,716	215724.49	163,242	10868.45	3,277,958	226592.94
March, 2014	60	584.88	2,998,331	205002.57	168,478	10420.54	3,166,809	215423.11
February, 2014	59	581.51	2,227,142	145560.13	132,932	7556.73	2,360,074	153116.86
January, 2014	59	568.43	2,030,898	132027.91	122,985	7460.71	2,153,883	139488.62
December,2013	59	557.62	1,837,216	117015.42	105,707	6505.07	1,942,923	123520.49
November, 2013	59	543.23	1,309,270	88159.88	85,580	5330.65	1,394,850	93490.53
October, 2013	59	537.55	1,223,796	73183.73	86,994	5288.45	1,310,790	78472.18
September, 2013	59	531.49	1,015,087	55274.81	86,334	4508.63	1,101,421	59783.44

Figure 6: Source www.npci.org.in – IMPS Volumes

Advent of Mobile

- What have incredibly influenced the payment system domain have been the advances in communications and the associated technology. The most remarkable of the developments is the mobile banking and payments .Banking experts cite several factors that contribute to the changing scenario:
- Cashless purchases are becoming norm not just in the developed countries but in Asia as well.
- Resistance among retailers to pay merchant fees to the credit card companies.
- Financial services institutions and credit card companies feel threatened by innovative payment technology start ups and they themselves forced to innovate.
- Near field communication (NFC) becoming a game changer in ushering in reliable cashless payment system.

MOBILE BANKING DATA	Volume	Value
2014 -2015	**171.92**	**1035.3**

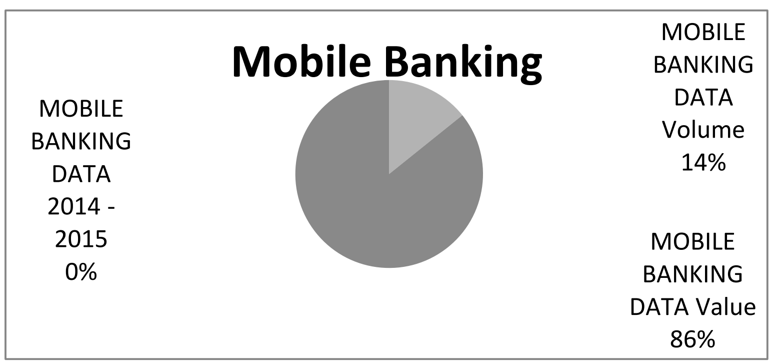


Figure 7: Source RBI Bulletin Mobile Banking Data

Global Recent developments in payment Services

- Barclays Pingit offers UK Account holders the ability to instantaneously transfer and rciv money for free using any Android or ios device .
- Moven and Ontrees are offering a combination of mobile banking and payment services via smartphone.
- Starbucks along with a number of other major retailers has introduced new payment options through mobile apps powered by near field communication.
- VocaLink is launching Zapp , which will allow retail customers to pay for purchases via smartphone.
- Ebay acquired payment services provider Braintree , whose

Venmo app supports payment by tablet and smartphone.

- HDFC Bank`s Chillr , a mobile app , allows to instantly transfer money to any contact in their phonebook.
- ICICI Bank facilitates voice authentication for funds transfer.

Emerging Scenario

- It would be interesting here to visualize few scenarios which may emerge in future:
- Simultaneous impact of playing out of Reed's law and Moore's law where both "the payment space" and "the pinpoints" within the space would grow exponentially.\
- Whether some of the technology companies and retail banks can undergo transformation to such an extent that the technology firm would appear more like a retail bank and vice-a-versa.ore and more collaboration between a bank and non-bank.
- The gradual shifting of micro payments to mobiles leading to reduction in requirements of physical currency notes and coins.
- Salaries and payments distributed directly on the mobile wallet akin to currency distribution.
- With the reduction in cash transaction, ATMs might have to offer other services rather than only dispensing cash in order to remain relevant.
- Ease of credit through KYC, Mass Market Credit Rating at the click of a button.
- Whether cross-border transactions can also happen on mobiles in future?
- The payment system players would have to gear up to accommodate and leverage upon such possibilities going ahead.

Challenges Ahead Regulatory Challenges

The innovations in the payment system space and introduction of new products are already posing challenges for the regulators and these challenges are likely to intensify going forward. Some of the possible dilemmas/challenges that the regulators would be faced with in future are:

- Whether payment and settlement would remain banks' preserve? If not, what would be regulatory stance?
- What would be the way forward in regulating virtual currencies?
- Cloud computing and Cyber Security
- Striking the right balance between ease of doing business and ensuring security
- Challenges from mobile transactions becoming more user centric than transaction centric
- Monitoring of cross-currency / cross-border mobile transactions, not if but when they happen.

  The most important challenge for the regulator would be to do a tight rope walk between providing the "Right Guidance but not at the cost of stifling innovation"

Industry level Challenges Convergence of products and channels- Competition, technology, increased customer demand for comfort and convenience and regulatory initiatives have resulted in introduction of several payment products and channels over the time. However, banks have built these products and channels into separate silos and vertical. The CII-PWC survey 'Payment Business in Indian Banks' brought out this issue of separate silos and lack of interoperability among these silos. For instance, in some banks the Core Banking System is usually different from the card processing system. The survey also highlights the issues that arise from disparate payment infrastructure for banks such as duplicity in work, lack of scalability, lack of STP, and increase in the cost of payment processing. So the moot point is whether banks have fathomed the benefits of convergence in payment systems? If analyzed from a customer's perspective, they maintain multiple payment instruments and multiple channels for different payment needs. Can we think of a regime where the all these payment instruments could be subsumed in a single instrument i.e. a single card acting as a debit card, credit card, pre-paid card and all purpose smart card? Can we think of convergence of channels- where mobile phones given their ubiquitous nature replace all payment channels and serve as portable device for all banking and financial service needs?

Strategic Partnership- The evolving payment systems scenario offers new challenges and opportunities to all segments of this industry. The new evolving landscape especially in the retail payments area which have been highlighted above provide interesting challenges in harnessing the potential of technology amongst different stakeholders such as banks, system providers and other technology partners. These challenges encompass the search for new business models, which are now cost effective and wider in their scope and reach in terms of both geographical and customer coverage. Therefore the evolving payment ecosystem not only would encompass banks and the technology in use but would also have as critical stakeholder's non-bank technology solution providers and system operators.

An example which readily comes into my mind is the need and relevance of crystallizing such a strategic partnership amongst banks, mobile payments service providers and mobile network operators (MNOs). This is very much required as RBI as well as Government of India have consciously adopted a bank-led model for mobile payments as opposed to a MNO-led model for achieving the financial inclusion objectives. As you are all aware financial inclusion in India consists of four set objectives which include (i) Savings cum Overdraft Account; (ii) A Remittance Product for Electronic Benefit Transfer and other Remittances; (iii) A Pure Savings Product ideally a recurring or variable recurring deposit and (iv) Entrepreneurial Credit such as General Credit Card (GCC), Kisan Credit Card (KCC). Moreover with the banks providing these products under the financial inclusion umbrella, it is but necessary that they also ensure compliance with KYC/AML norms, create adequate risk management framework and ensure prompt settlement of funds. Given this comprehensive focus it is therefore necessary that MNOs actively collaborate with the banks to achieve objectives for financial inclusion. Therefore, this facet of a strategic and collaborative partnership framework needs to be recognized and given due impetus as it would provide the basic banking services to the 'aam aadmi'.

The role of payment aggregators and payment gateways. These entities are essential specialized technology providers who have come to occupy a niche area in the payment industry. Banks find it convenient to make use of the services of these entities to help them in their payment processing activities. While these entities play a significant role, it should be taken into account by the banking industry that proper service level agreements need to be put in place for minimizing and mitigating risk including the safety of customer funds. I would draw your attention in this connection to the contents of the "Guidelines on Managing Risks and Code of Conduct in Outsourcing of Financial Services by banks" issued by Reserve Bank of India and the measures listed therein for managing and mitigating risks associated with outsourcing.

Outsourcing of Activities Outsourcing is a reality that all of us have to live with. President Obama is fond of saying that jobs in USA have been 'bangalored' drawing an obvious reference to the fact that outsourcing provide cost savings and efficiency in operation leading the business entities to focus on their core activities. We are also witnessing a similar phenomenon in the banking sector with various activities especially technology related being outsourced to specialized entities. Whilst this arrangement has served the industry well, it must be recognized that outsourcing does not result in abdication of providing efficient services to the customer nor should it result in dilution of risk management practices and standards including the concentration risk of relying on few specialized entities.

Another challenge for banks would be how to address the technology obsolescence through continuous technology up gradation. Apart from cost, up gradation poses significant challenges for banks in terms of replication across all technology assets and building awareness of end users and customers,

Creating and tapping the value chain

Government transactions- Transfer of benefit schemes: The largest chunk of government transactions with the citizens comprises revenue collection and transfer of benefits under various social programmes. McKinsey Report 2010 'Inclusive growth and financial security: The benfits of e-paymnets to Indian Society estimates that an electronic platform for government payments to and from individual households could save an estimated Rs.100, 000 crore a year – representing almost 10 percent of the total payment flows between the government and households. The report states that "delivering government payments electronically to the poor will not only pay for itself but will connect households to a formal and secure financial grid. The basic infrastructure and connectivity this provides will also create an attractive business proposition to encourage private players to enter this space and provide services to the poor". The Reserve Bank has recently issued "Operational Guidelines on implementation of Electronic Benefit Transfer (EBT) and its convergence with Financial Inclusion Plan (FIP)". These guidelines are expected to give a fillip to financial inclusion efforts and lead to a scalable and sustainable financial inclusion model. In fact as you may be aware the Union Finance Ministry has advised all state owned banks and financial institutions to make payments only through electronic transfers and not through cheques from 1st September 2011. This move is part of the e-governance initiative to move towards a paperless funds transfer system. For the banks as well this would be economical proposition as it would reduce paper handling costs.

Potential triggers- Public transport, toll payments, tax payments etc.: There is tremendous scope for introducing stored value cards for public transport systems, toll taxes and local tax collections. The national highways alone constitute 40% of the total road traffic in India. The government had appointed a committee under the chairmanship of Shri. Nandan Nilekani, Chairman, UIDAI to examine all technologies available for Electronic Toll Collection (ETC) at the toll gates which has recommended use of RFID tags for electronic toll collection on national highways. Similarly, the integrated urban transport projects being implemented in metros like Mumbai, Delhi, etc, have potential for stored value cards. The store value card could be used for both contact and contactless payments for low value payments and could be modelled upon Oyster card in London and the Octopus card in Hong Kong.

Banks could identify the needs and requirements of customers, merchants, distributors, industry they are serving and create value proposition. With industry focusing on rural and semi-urban India, they would require a mechanism for channelizing the proceeds across vast geographical jurisdiction. Banks could tap this huge potential.

Conclusion

Last few years have seen expansion in the payment system infrastructure as a whole. There has been entry of new payment system operators, growing acceptance of new delivery channels, new products, increase in number of ATMs (80000+), PoS terminals (610156), augmentation and scaling of payment processing infrastructure etc. We have also witnessed the use of services provided by payment facilitators such as intermediaries, technology solution providers and merchant acquirers gaining ground in the industry.

There is growing feeling that increased competition has commoditized the payment services undermining its profit generating ability. However, the McKinsey Global Payment Map, 2009 pegs that the payments services generate worldwide revenues of more than $900 billion each year (figure for 2007) which represent roughly 25 to 30 percent of total bank revenues. Payments services thus not only provide a steady income stream for banks but also provide them daily opportunities to serve consumer thereby reinforce their brand. In India the recent spurt in cashless payment modes provide ample opportunity to payment system providers[4]. It is therefore necessary that banks view their investment in technology not as a cost but as a revenue making proposition enabling customers to access banking facilities especially various payment modes at their comfort without necessarily visiting a brick and mortar branch.

As per the report on the E-commerce released by the Internet and mobile Association of India (IAMAI), the internet commerce industry in India is expected to INR 46,520 crores by end of 2011. The e-commerce and m-commerce are poised for a big stride in coming years. Banks and payment system operators could leverage on the huge potential of e-commerce and m-commerce.

Both developed and developing Countries have developed innovative ways and making a difference to the payment systems in their respective countries through diverse product and service offerings. Evolution and growth of card payment mechanism and mobile payments have been deliberated upon and so also, the issues of cyber security, innovation in payment systems, challenges/ opportunities faced by the global payment systems, etc. national payment schemes operating in different economies across the globe.

It is in the last 10 years that India has seen a major shift from cash based payment systems to electronic payment systems, thanks to various measures initiated by the Reserve Bank of India including the introduction of Payment and settlement act, the setting up of a robust RTGS / NEFT platform and the National Payments Corporation of India, regulation and platform of alternate channels and payment gateways and guidelines on security measures for all electronictransactions. Payment Systems have paved the way for New Banking Paradigms by bringing new financial technology driven instruments with customer `s satisfaction and risk management techniques.

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