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COMMERCIAL FEATURE
IN ASSOCIATION WITH IDRBT Explore, Enable, Excel | NPCI National Payments Corporation of India

Electronic Payment Systems in India

"LOT HAS BEEN DONE AND LOTS MORE TO BE DONE"

The Banking Industry in India has been undergoing a rapid transformation and their significant focus is on driving electronic payments through mobile banking, social media banking, wallets and other consumer centric payment services. With the payments landscape fast evolving with new payment systems being implemented and payment banks emerging as new players, the role of bank and non-bank players in electronic payments and financial technology is becoming important for the ecosystem.

DR. A. S. RAMASASTRI
Director, IDRBT

IDRBT plays a key role in determining the technology requirements of the Indian Banking & Financial Sector and researches & develops the required technologies. It incubates and develops state-of-the-art banking technology products and services to facilitate better and easy banking. The institution understands the emerging global technology trends, its implication, and guides the Indian Banking and Financial Sector accordingly. It provides training, advisory and consultancy services on technology, technology infrastructure, and technology management matters for banking and financial sector. Primarily the role of IDRBT is that of a catalyst in development of banking technology. and it also actively contributes to the development of standards and best practices.

The Banking Industry in India has been undergoing a rapid transformation and their significant focus is on driving electronic payments through mobile banking, social media banking, wallets and other consumer centric payment services. With the payments landscape fast evolving with new payment systems being implemented and payment banks emerging as new players, the role of bank and non-bank players in electronic payments and financial technology is becoming important for the ecosystem.

IDRBT's contribution in electronic payment ecosystem has been remarkable. To know more about electronic payment, we spoke to Dr. Ramasastri, Director, IDRBT. The following are the extracts of the interview.

> Set up in 1996, IDRBT has played a momentous role, emerging as a preferred Research and Development Institution on Financial Sector Technology

Electronic payments are set to grow in a big way in India in the coming years. What has been the role of RBI as an enabler of this emerging innovation?

The central bank of the country has been both the driving and guiding force behind most of the developments in electronic payment systems in India. In addition to implementing the critical payment systems like RTGS and NEFT around the state-of-the-art technology, the Reserve Bank of India (RBI) has been instrumental in setting up organizations like NPCI to drive retail payment systems further. It has been encouraging players in the space of pre-paid instruments and digital wallets. It has taken a recent step to usher in the era of payment banks, which are expected to commence their operations as digital banks from day one and revolutionize the payment space in India. Bharat Bill Payment System is yet another initiative that is likely to change the landscape of electronic payments in India.

How is the NPCI contributing in this regard? Can you throw some light on this aspect?

The role of National Payment Corporation of India (NPCI) is very significant. NPCI has been steadily building the necessary infrastructure to enhance the scope of electronic payments in the country. As the first step in this direction, it has taken over the operations of NFS from IDRBT. There afterwards it introduced IMPS, Rupay card and UPI – all of which are playing their role in increasing the use of electronic payment systems across the country.

How is the Government facilitating the growth of electronic payments?

One of the major initiative of the Government of India is to mandate direct benefit transfer (DBT) using electronic mode for its payments like pensions and subsidies. The massive drive of Jan Dhan Yojana is a prelude to move payments to electronic route. Linking Aadhar to bank accounts, various schemes and payment channels will go a long way in the adoption of electronic payment systems.

How has the industry taken to this new initiative, have they been quick to accept the new development?

There has been a very positive response from the various industry players. The banks, pre-paid payment instrument companies and payment gateway providers have all been alive to the emerging trends in electronic payment systems and active in implementing products and services exploiting the evolving technology. Telecoms and IT companies have been working on enhancements in infrastructure and applications.

We know for a fact that IDRBT has been playing a very important role as far as technology in the Indian Banking System is concerned. Can you elaborate on the role of IDRBT and mention some key areas of your work?

IDRBT, research and development institute established by RBI exclusively for banking technology, has been working on several fronts to promote electronic payment systems in India. The Institute, along with the company floated by it viz IFTAS runs the critical financial network, INFINET and messaging platform, SFMS. In addition to providing training to bankers on latest developments in this area, IDRBT has been working on some of the latest technologies like Merkle Trees that provide the foundation for Blockchain based digital ledgers, which in turn are the base on which crypto currencies are built. In addition to the existing centres on mobile payments, cyber security, analytics, cloud computing and open source technologies, it is in the process of setting up a centre on payment systems to focus on research in the area.

In order to pool the research and implementation initiatives in the country, IDRBT has conducted the payment system innovation contest and the grand finale of the contest is on June 24, 2016 (details in the box)

Going forward, how is the digital payments in the country expected to grow vis-à-vis paper based payments, as digital banking becomes more penetrative?

The banks and other companies are already introducing innovative technology centric products and services in providing several payment system alternatives to customers. Payment banks are likely to start as digital banks and bring the latest technology into payment systems. More importantly, variations of digital currencies are likely to be introduced in a very small way in various countries and depending on the experience, each country may adopt the suitable variation of the digital currency in its jurisdiction. The future is possibly that of digital currencies.

What more needs to be done as the payments landscape evolves?

Though we all can say with some satisfaction that a lot has been done to usher in electronic payment systems in the country, we also need to acknowledge that a lot more needs to be done. The recent IDRBT survey on payment systems by migrant workers in two districts of Telangana and Andhra Pradesh brings out clearly the extent of cash transfers that are still being effected by the migrant workers through informal channels. Majority of them are still not using the electronic payment facilities provided by banks and other payment system service providers. There is a need to work to ensure that such payments are brought to more efficient electronic channel.

PAYMENT SYSTEM INNOVATION CONTEST

IN order to encourage innovation in payment systems, RBI has announced payment system innovation contest, which was conducted by IDRBT. Individuals, academic institutions, banks, payment companies, including start-ups responded to the announcement. There have been 115 entries, three of which have been from outside the country. A short listing committee selected 12 entries for final presentation and 14 more entries for inclusion in the booklet presenting gist of the innovations to be brought out by IDRBT. As part of the grand finale of the contest, the twelve short listed contestants will be presenting to an eminent Jury, top management of RBI and other invitees. Based on the presentations, the Jury would select three best entries for prizes or Rs 5, 3 and 1 lakh respectively. The prizes are sponsored by the Reserve Bank of India. Shri H R Khan, Deputy Governor will be giving away the cash prizes and also release the booklet containing the gist of innovations of the selected participants. The event is scheduled on June 24, 2016.

NPCI'S VISION TO DIGITISE RETAIL PAYMENTS IN INDIA

Usage of electronic payments system is growing with every passing year and towards this the National Payments Corporation of India (NPCI) is developing a metric to assess the extent to which electronic payments have gone universal in India. Considering that NPCI is the umbrella organisation for all retail payment systems, it is its vicarious responsibility to ensure that every Indian has access to electronic payments in a secure, convenient and affordable way.

A. P. HOTA
MD & CEO, NPCL

Access to bank accounts - Anecdotal evidence shows that even after PMJDY, many adult citizens still do not have bank accounts despite the fact that there are about 1,30,000 bank branches and a similar number of business correspondent outlets supporting the branches for opening of bank accounts. Though, banks have reported more than a billion accounts but unique numbers of active accounts could be only around 500 - 600 million. This is the reason the Reserve Bank of India (RBI) has permitted new categories of banks called payments banks, small finance banks and 36 Prepaid Service Providers (PPI). RBI has also permitted inter-operability of funds transfer between banks and prepaid institutions.

Acceptance Points - Once bank accounts are opened, the need arises for electronic channels to make digital payments. India has 2,22,000 ATMs and 1.3 million Point of Sale (POS) devices which in fact very low given the large size of population and geographical spread. China, Brazil and the US have 15 million, 7 million and 5.5 million POS terminals respectively. India needs to have the POS infrastructure at least at par with China. Mobile based POS devices have made an entry, but yet to become a mainstream acceptance device. Analysis of last year's ATM & PoS transactions revel that number of ATMs in the country has grown by more than 10%. In fact, about 14,000 ATMs have been deployed in FY16. In terms of consumer preference, ATM transactions grew by over 15%. Similarly, number of PoS devices has grown at the rate of 23% and contributed towards incremental growth of debit cards usage at PoS terminal by 45% and credit cards usage at PoS terminals by 27% respectively.

Mobile Payments - Mobile based payments are leapfrogging in India. Having close to 600 million mobile accounts and over 250 million smart phones, India can develop mobile banking solutions at an unprecedented scale and speed. It could influence nearly 60% of our countrymen, 35 years of age or below to transact on mobile than over the internet. The PPIs have played a stellar role in promotion of mobile and electronic payments. NPCI's Immediate Payment Service (IMPS) is playing a key role in promoting mobile payments. This is being taken to a new level through Unified Payments Interface (UPI) where a customer can not only push money instantly, but also initiate collect payment requests with just an email like financial address. E-commerce is going to get a big boost when UPI gets fully operational.

> NPCI's Immediate Payment Service (IMPS) is playing a key role in promoting mobile payments. This is being taken to a new level through Unified Payments Interface (UPI)

DBT Infrastructure - The recently launched schemes on Direct Benefit Transfers (DBT) for LPG subsidy and various other social welfare programmes have facilitated use of electronic channels. Now the benefits are directly credited to bank accounts and the beneficiaries have no way but to make use of electronic payment services to make use of funds. While cash is traversed through Aadhar Payments Bridge (APB), the beneficiaries can use POS terminals, ATMs or micro ATMs (POS like device with manual cash payments) to make payments. Government has a massive plan to make use of APB for all types of welfare benefit payments which would touch many Indians to electronic payment platform. Micro payments through electronic means are the surest way to take digital payments universal.

Micro Payments - Currently, bulk of the transit ticketing is through cash and therefore, digitisation of payments in this area is a must. There is a need for Tap & Go based payments and in this regards, experiments have been undertaken. This year, there are plans to launch National Common Mobility Card (NCMC) which can be used in all metros, busses and suburban trains in an interoperable way. NPCI specifications on NCMC have been adopted for BMTC bus rides in Bengaluru. Similarly, there are plans to use Tag based toll gate payments which will enable the vehicles to move freely through the toll gates.

Bill Payments - Another area being explored is making bill payments digital. At the instance of RBI, NPCI would shortly be launching Bharat Bill Payment System (BBPS) whereby bank customers would be able to make bill payments through any channel. Mostly digital bill payments will be performed when all the billers start participating in BBPS. Customers on one side and billers on another side would be made completely inter- operable through the network of BBPS operators and their agents.

RBI's policy stance is towards promoting a less cash/less paper society

RBI's overall regulatory policy stance is oriented towards promoting a less cash/less paper society, the "green" initiative, and hence the increased emphasis on the use of electronic payment products and services that can be accessed anywhere and anytime by all at affordable prices. Embracing new technology and innovation to unveil a bouquet of simple, low cost, easy to use modern payment products and services would be the corner stone of this endeavour. The Reserve Bank recognises that building dexterity of payment systems through standardisation and a broad consultative process is a continuing agenda.

The Reserve Bank of India, (RBI) vision is to proactively encourage electronic payment systems for ushering in a less-cash society in India and to ensure payment and settlement systems in the country are safe, efficient, interoperable, authorised, accessible, inclusive and compliant with international standards. This has been very clearly enumerated in its Vision Document "Payment Systems in India - Vision 2002-15."

Further it states that payment systems will be driven by customer demands of convenience ease of use and access that will impel the necessary convergence in innovative e-payment products and capabilities. Integration of various systems through unified solution architecture and current technology would lead to adoption and usage of resilient payment systems. Regulation will channelize innovation and competition to meet these demands consistent with international standards and best practices.

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In light of the above, the Vision Statement sets out the roadmap to ensure benefits of a structured modern payment and settlement systems, including innovative products, to reach out beyond the currently served target groups thereby facilitating greater financial inclusion. This is to be achieved by nurturing a payment system that adequately serves the national and international transaction needs of the nation.

> The Vision Statement sets out the roadmap to ensure benefits of a structured modern payment and settlement systems, including innovative products

The payment system initiatives taken by the Reserve Bank of India have resulted in deeper acceptance and penetration of non-cash payment modes. Cheques, however, continue to be the dominant mode in retail payments constituting 54 percent in terms of volume and 82 percent in terms of value (2011-12) with retail electronic payments lagging behind.

An analysis of the payment system landscape in India reveals that while the growth of electronic payments including RTGS transactions has been impressive, the benefits of modern electronic payment systems are yet to reach all sections of the society and be accepted across the length and breadth of the country. Current experience and evidence indicates that the penetration and success of modern electronic payment products and services is concentrated to a large extent in the tier-I and tier-II locations of the country and mostly to those citizens who already have access to the formal banking channels.

OPPORTUNITIES AND CHALLENGES

Indian payment systems pose significant opportunities and challenges/ threats in the coming years. An indication of the scope of the challenges and opportunities can be gathered from the following few pointers:

- With financial inclusion gaining pace and the number of bank accounts increasing at a sustained pace, the number of transactions is likely to increase further as citizens start using the banking channel and the payment and settlement infrastructure. This 'bottom and the middle of the pyramid' presents a large untapped market.
- Cash is the preferred mode of payment for those sections of society not having access to formal payment systems. Electronic payments, even

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COMMERCIAL FEATURE

FINANCIAL WORLD RAPIDLY ACCEPTING BLOCKCHAIN TECHNOLOGY

The underlying technology to Bitcoin is the Blockchain technology or more popularly called distributed ledger and is the key attraction. The distributed ledger allows for implementing a decentralized financial system. Unlike the traditional monetary policies that deal with setting of key benchmark rates by a group of people or entities working together, Blockchain technology through its decentralized design allows every participant to have a say in the decision making. Blockchain technology requires the database to be replicated at each participant's location.

In the recent times, the concept of Blockchain was brought to the forefront because of wide curiosity in Bitcoin. While Bitcoin has brought in a lot of legislative debate across the globe on its technical capability to serve as an alternative currency and should it serve, in what capacity? The debate has subdued and the underlying technology i.e. Blockchain/distributed ledger is now gaining wide spread acceptance in the financial world.

FIRST FORM OF ELECTRONIC CURRENCY

Unlike the previous attempts to create an electronic currency, Bitcoin did survive largely due to the penetration of communication technologies and pervasive computing platforms in the form of mobile internet devices. Further, Bitcoin is the first decentralized form of electronic currency. In the last few years, it is in fact the fully decentralized nature of Bitcoin that spur great interest in it among people from financial world. Today, in fact people from both the technology as well as financial world have understood that Bitcoin is not about money but rather about a technology.

WHAT IS BLOCKCHAIN TECHNOLOGY?

The underlying technology to Bitcoin is the Blockchain technology or more popularly called distributed ledger and is the key attraction. The distributed ledger allows for implementing a decentralized financial system. Unlike the traditional monetary policies that deal with setting of key benchmark rates by a group of people or entities working together, Blockchain technology through its decentralized design allows every participant to have a say in the decision making. The traditional banking sector is based on a client server model with the database located at the server, Blockchain technology requires the database to be replicated at each participant's location. Having a distributed ledger management aids in bringing transparency to the financial world.

ADDITIONAL CHALLENGES

With such widespread replication of database, come additional challenges of data integrity, consistency and authenticity. In a centralized IT system like the one we see in the banking industry today, we use either RSA or elliptic curve cryptography for authenticity and hashing mechanisms for message integrity. But these techniques are not ideal for a distributed/decentralized environment and hence crypto mechanisms based on Merkle trees are used. While Merkle trees can be used for authentication as well as integrity; Bitcoin and other distributed ledger mechanisms primarily use it for message integrity. While the idea was originally proposed and patented by Ralph Merkle in 1979, today with ever growing number of devices and machines talking to one another and exchanging an ever growing amount of information, it has become a popular mechanism for exchange of information in a secure manner in various scenarios such as V2X communication in driverless cars, and Device-to-Device communication in Internet of things and finally in the financial sector for executing LCs and BGs.

BLOCKCHAIN IN FINANCIAL SERVICES

Dozens of Players	**INTER INDUSTRY INTERMEDIARIES**	Clearing networks international transfers
Hundreds of processes	**BACK- END PROCESSES**	IT & Business reengineering to support all these changes
Thousands of use cases	**TRADING & CAPITAL MARKETS**	Securities & instruments Syndicated loans Clearing & settlements Asset ownerships Bond sales Digital receipts
Millions of Businesses	**B2B SERVICES**	Insurance Payemnts Trust Escrow
Billions of Users	**CONSUMER FACING**	Mortgages Digital identities Wallets Exchanges Simple transfers & Payments

Increasing Evolution complexity & Delivery timeframe

DISTRIBUTED LEDGER OR BLOCKCHAIN

The distributed ledger or a Blockchain is a series of blocks with each block containing financial transaction data that is logically put together and stored. Therefore, the Blockchain serves as a public ledger of all financial transactions that have ever been executed. The logical piece of information inside each block in the chain holds details about the most recent transaction, the intended receiver of the transaction and some information pointing to the previous block. The identity of the receiver of the money involved in the transaction is indicated by the receiver's public key.

MERKLE TREE

A Merkle tree, in the most general sense, is a way of hashing a large number of blocks of data by grouping them in pairs. Pairs of blocks are recursively hashed until we are left with one node which is also called the merkle root. This merkle root is published to the members and tampering of the content of any single node forming the tree or the root itself can easily be detected because of the mathematical properties of hashing algorithm. Proof of work as in case of Bitcoin is determined by the value of the merkle root having specific pre-agreed criteria (say smaller than a specific number) is then validated by other members of the community. This trusted root is then combined with a fresh set of transactions (put into a single block) that are not part of any previous block and chained together to form a new root.

EMERGING APPLICATIONS OF DISTRIBUTED LEDGER

Since this distributed ledger has the entire history of financial transactions, the community can at any time investigate the transactions. Every individual on making a financial transaction should submit a request to the community asking for it to be included into Blockchain and possibly will have to pay a small transaction fee for his to be validated and merged into the Blockchain.

While financial transactions were the primary application of Blockchain in case of Bitcoin, biggest financial institutions involved in trading are looking at it to serve their needs for executing long term contracts as in LCs, BGs and derivatives. Just as with any other banking IT system, doing so requires new set of software in the form of either client IT system and a software platform to exchange the contracts. In the last couple of years, just in case of mobile payment ecosystem, quite many companies have started offering solutions to facilitate Blockchain based financial interactions. But one project that uniquely stands apart and is probably among the earliest is the open source project called Ethereum.

ETHEREUM PROJECT

The intent of Ethereum is to create an alternative protocol for building decentralized applications, providing a different set of tradeoffs that we believe will be very useful for a large class of decentralized applications, with particular emphasis on situations where rapid development time, security for small and rarely used applications, and the ability of different applications to very efficiently interact, are important. The project attempts to build the generalized technology; technology on which all transaction-based state machine concepts may be built. Moreover, it aims to provide to the end-developer a tightly integrated end-to-end system for building software on a hitherto unexplored compute paradigm in the mainstream: a trustful object messaging compute framework.

BITCOIN VERSUS ETHEREUM

While Bit Coin aimed to transfer monetary value without the need for maintaining a centralized ledger, Ethereum wants to take it a step further by making it possible to set up binding contracts outside of the legal system. In addition to its virtual currency called Ether, Ethereum includes a programming language that makes it possible to encode binding agreements embedded in the same transaction on the ledger. In doing so Ethereum solves one major technical challenge faced by Bitcoin, scalability. Bitcoin's major drawback was the ever growing size of transaction blocks which makes it infeasible and impractical as transaction volume increase. Ethereum developers overcome the challenges of scalability and maintaining consensus (without consensus there is a chance for multiple forks being established) among participants by developing Greedy Heaviest Observed Subtree or GHOST protocol.

As the IT ecosystem surrounding Blockchain technology continues to grow along with interest of global investment banks and financial institutions, the time is right to pursue the technology for enabling micro payments.

Banking now on social media

THE growth of social media such has Facebook has led to companies registering their presence on the medium and using the same to drive customer relationships, feedbacks and product promotions. Just as the corporates are listening to their customers on the social media, so are the Indian banks who have increased their presence on the platform in a big way.

Banks are offering services like money transfer facilities apart from promoting their products, improve their branding, resolve customer queries and make important announcements.

In particular Indian banks have launched banking service through which you can transfer funds using the social media platform, in short send money to anyone with a bank account, if you know his/her mobile number or email address, or if the person is your Facebook friend or follows you on Twitter. The user can pay bills, recharge mobiles, book movie tickets, order food and send gifts using bank's e-wallet. Users can choose to add a zero-balance savings account to the wallet, which will allow them to earn interest on their idle money. For each transaction, there is a unique dynamically generated OTP (One Time Password) that is sent to the sender's mobile number, registered with the Bank, to verify that the transaction is initiated by customer of the bank.

Experts strongly believe that social media, indeed, has the power to increase business, cater better to customer requirements, and resolve queries at the same time. It gets the company closer to the customer by serving them better. With the competition in the banking industry growing rapidly, it is absolutely necessary for banks to use the social media space, to garner more and more business, while also keeping their customers happy.

For this the banking industry will have to continue to invest in the social media and mobile platform.

Non-bank payment players become more active

THE Reserve Bank of India (RBI) sometime back introduced customer friendly regulations, including the licensing of Payments Banks. These regulations provide a framework for a variety of organizations to provide payment and deposit services at scale in the country. As a further boost to electronic payments players the Government recently approved the withdrawal of surcharge, service charge and convenience fee on card and digital payments. There is likely to be greater adoption of the online platform for making utility payments and e-commerce. However, a lot of work remains to be done.

The industry has recently witnessed the entry of various non-bank digital players, including technology giants and start-ups that are presenting increased competition for banks. The nature of the competitors, the prominence of smartphones as a channel and rapidly evolving customer expectations are the main factors which are expected to enable technology titans and start-ups to raise the competition bar. In this context, in order to stay relevant, banks will need to respond to these changes with new strategies, capabilities and operating models.

Some developments in this regard are

- Modernisation of domestic payments infrastructures is under way. The payments industry is currently witnessing a wave of infrastructure modernisation that is required to compete with non-bank innovators.
- There is a need for business-facing businesses to support and maintain the convenience and security of the retail sector. As customers grow accustomed to faster and more convenient payments on the retail side, they will soon demand similar conveniences and service levels in transaction banking, the same source indicates.

Significant security aspects of electronic money and payment solutions

While the payment and settlement platform for handling payment messages is usually in the realm of regulator and hence often doesn't directly concern the payer, the payer is more interested in the ergonomics, security and flexibility of the end user device that enables him to connect to the platform. The last five years has seen a phenomenal growth on the capabilities of end user paraphernalia to increase the connectivity of the participant to the platform. Some of the end user payment enablers are mobile applications whose success in turn depends on mobile hardware or an end user hardware in the form of either a smartwatch or smartphone or key fob. Of course the nature of end user solutions depends on whether the payment solution is meant for proximity payments or remote payments. While the regulator sets standards for the encryption algorithms to be used to ensure the integrity of the financial message flowing through the payment and settlement platform, considerable room is left for innovation as the regulator only insists on having a two factor authentication.

In the realm of banking, a retail payment solution consists of three primary physical entities in the form of Customer, Merchant and Bank. But in the realm of electronic world to facilitate interactions between the same three entities there is a need for an elaborate payment and settlement platform to create and transfer trust between the customer and merchant. The success of the payment and settlement platform depends on three factors. The first, is its ability to accept a diverse set of payment messages that could be originating either from a software platform or hardware kiosk, the second is the ability to deal with diverse set of authentication mechanisms and the last easy access to end user software and hardware paraphernalia for the participants in the ecosystem to trigger and receive payments.

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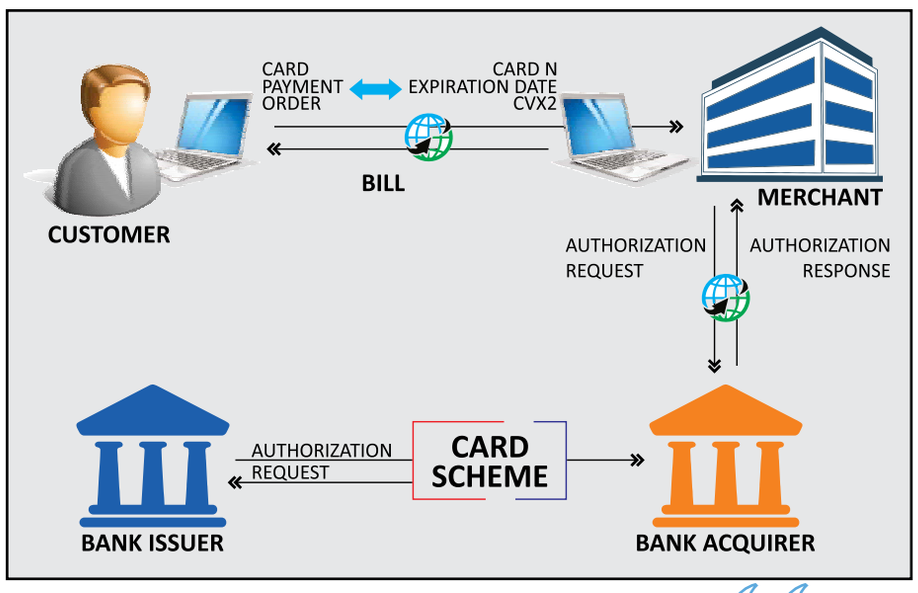
While the regulator sets standards for the encryption algorithms to be used to ensure the integrity of the financial message flowing through the payment and settlement platform, considerable room is left for innovation as the regulator only insists on having a two factor authentication. This broad definition has enabled a lot innovation in both proximity as well remote payments.

While there could be multiple financial players involved in moving electronic money from payer to payee, there are only two categories of people as far as the IT platform is concerned - Payer and platform solution provider While Public Key Infrastructure (PKI) is not a solution when concerned with retail payments, as it is quite expensive and difficult for the end user to manage his private keys, cost effective alternatives to PKI are in the form of Certificate Less Public Key Cryptography (CLPKC) and Identity Based Encryption (IBE). Both can be pursued to conduct financial transactions between people belonging to same organization or payment platform. As today quite many banks pursue utilizing social networking platforms as payment platforms identity based cryptography can be an ideal alternative. Apart from dealing with technology issues related to revocation of digital certificates and dissemination of the same through certification revocation lists, the cost associated with managing a certificate authority matters.



While CLPKC still needs a central authority to map identities to digital certificates, it allows for the end user to generate his own public and private key pairs remotely. This greatly reduces the dependency on a certificate authority which more aptly can be called a registration authority. The solution however suffers from incompatibility issues related to transfer of information between members being managed by different registration authorities. They can be considered as good alternatives for handling LCs and BGs. Identity based cryptography allows for the end user to generate his certificate based on his established authority and works well as long as this identity is ensured to be unique and can be mapped to a physical identity without ambiguity. The unique ID could be an email address or a login ID and is used to generate a public and private key pair. Given the widespread popularity of Facebook and Whatsapp and given that they are widely used by individuals to keep in touch with family and friends, they can be considered genuine enough to be tracked to a physical person and hence banks especially payment banks can pursue IBE for enabling secure payments over these platforms.

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While the above two solutions are to be provisioned by someone managing the payment platform, innovation is greatly assisting the end user i.e. the payer from having to be bothered about having to remember a unique password each of his financial accounts. Wallet based solutions being offered by Apple (Apple pay), Samsung (Samsung pay) and Google (Android pay) have greatly reduced the time taken to complete proximity payments. The security offered by these solutions is mature enough to avoid the need for two factor authentication for proximity payments. Unlike the security mechanism used in traditional card based transactions which is based on SET protocol, the transaction message does not have to card the credit card details and his PIN. The card and a dynamic token is generated for each transaction and is the only information that is relayed to the issuing bank for verification. In addition to security dynamic tokenization ensures the privacy of the customer while his card details are secured in the HSM module available in the smart phone.

The other aspect of making innovation in proximity solutions is creating physical and compatible infrastructure at merchant outlets. The hardware could be in the form of PoS terminals or card readers at ATMs or lightweight hardware for banking correspondents. Companies such as Square have created low cost secure card readers that are ideally suited for banking correspondents and for small retail outlets that handle lot of low value transactions. These card readers can be readily plugged to a smart phone and thus converting the smart phone into a PoS terminal. Similar hardware is available from several other companies in the form of key fobs.

Unified Payment Interface (UPI) payment platform brought forward by NPCI is definitely going to be a game changer, an even bigger advancement it has made in its design is provisioning for biometric authentication. While accuracy of biometric authentications systems continues to be questioned, it nevertheless is a facilitator of several payment solutions such as Apple Pay. In the last couple of years several global banks have either deployed or in the process of deploying biometric authentication mechanisms as an alternative to password poor management of which is often of the primary reasons for fraud in retail payments. Both Google and Microsoft are working towards provisioning more advanced biometric authentication systems, the world is moving towards killing the PIN/password. Recently Google's Advanced Technologies and Projects Group (ATAP) as part of its project abacus demonstrated that would create a digital identity based on the behavioral aspects of the smartphone user and similarly Microsoft will soon provide built in facial and fingerprint recognition in Windows 10 with Windows Hello which could be a great boon for banks to switch to biometric authentication.

As smart phones continue to replace laptops as the primary means of consuming and generating information, smart phone vendors along with OS vendors are increasingly committed to providing advanced security features out of the box that in turn would let the application developer to place end-to-end security in his app based services.

GAME OF COINS

An innovation that has broken the ripples is the Peer-to-Peer payment and settlement system or in other words Unified Payment Interface, RBI's latest offering that will literally turn your mobile phone into your debit card. All you need is a bank account and a smartphone, through which you will get your unique UPI ID, to make your money transactions without compromising on your safety and privacy. It allows interbank transactions in real time and uses a single-click two-factor authentication system recommended by the RBI for subsequent transactions, splitting bills among friends, paying insurance, donations etc.

Try recalling a time little less than a decade ago. The walk to the tiny four-by-four kiosk just around the corner of your street to get a recharge for your mobile; or standing in a long meandering queues to pay your electricity bills or transfer money. Even the thought of these things today is so unpleasant because, today everything from payments to money transfers happen on a tap or click of a button. Welcome to the age of electronic money where things have changed and they are still evolving. We will soon reach a time when currency notes will be redundant.

CHANGING DYNAMICS

Let's take a look at this first from a B2C standpoint. Though at the moment, under 10% of the population does the personal expenditures digitally, the numbers will soon see a dramatic jump. To give a perspective of the transition from physical cash transactions to electronic, IMPS, exceeded the total volume of remittance done by the Indian Money Order and electronic clearance of cheques is at par if not ahead of manual clearance. This is a huge jump for the country, considering that the transformation began very recently. Real time payments are overtaking the traditional payments. Even before you know it, the smartphone would have replaced the cards, considering the sales of both the debit and credit cards have already begun to see a dip. To add to this, let's discuss the online payment system done via cards. There are two-point authentication that takes place during an online payment – the card number and the one time password. With the advent and growing popularity of digital wallets, the mobile phone will replace the 'what you have authentication'.

UPI INTERFACE

Another innovation that has broken the ripples is the Peer-to-Peer payment and settlement system or in other words Unified Payment Interface, RBI's latest offering that will literally turn your mobile phone into your debit card. All you need is a bank account and a smartphone, through which you will get your unique UPI ID, to make your money transactions without compromising on your safety and privacy. It allows interbank transactions in real time and uses a single-click two-factor authentication system recommended by the RBI for subsequent transactions, splitting bills among friends, paying insurance, donations etc. Currently 29 banks have agreed to the UPI and are in the process of upgrading their mobile apps to integrate UPI to their interface.

BENEFITS OF E-MONEY

Now that we have established the benefits of electronic money (e-money) for the end user, let's talk about the government and corporate enterprises. The adoption of electronic money will help the government get better control and know exactly how much is lying in the reserve, the flow of money and just how much needs to be injected into the system for circulation and when. But that isn't the only the advantage. The cost of handling and managing physical cash is huge and concerted campaigns against physical cash and moving to digital money have been done in various countries. The advantages are not only on lower cost of managing money, but preventing anonymous large transactions and making a dent in the shadow economy of the country which by some estimates is perhaps as larger, if not larger, than the reported GDP.

To give you a perspective of the colossal amount spent on exchanging the old deteriorating currency notes for new ones. Last year, in India, over 164 crore pre-2005 currency notes of various denominations, were shredded in regional offices of Reserve Bank. The face value of the shredded currency notes was around Rs 21,750 crore. Another advantage that cannot be ignored is that digital cash cannot be counterfeited. By choosing digital cash over physical notes, a governing body can protect the integrity of their currency.

CONCERNS

While options are bound only by one's imagination, there have been a few con-

Continued on Page 4...

RBI's policy stance is towards promoting a less cash/less paper society

...Continued From Page 1

with an associated fee, can be less expensive compared to the available alternatives. The use of electronic payment instruments allows the unbanked to start building a transaction history, which can be a step towards initiating them towards financial inclusion.

- There is a huge potential of migrating government transactions (payments and receipts) to electronic mode.
- Retailers card payment acceptance infrastructure in India needs to be grown exponentially.
- The e-commerce and m-commerce platforms are poised for a big stride in coming years. Similarly, electronic bill presentment and payments involving insurance, utility bills, taxes, school fees, etc. present a huge opportunity.

To accomplish the vision of a less-cash society, if not cashless society, the key elements which would impact all our efforts towards creation of a modern and widespread payment system are: Accessibility, Availability, Awareness, Acceptability, Affordability, Assurance and Appropriateness **(7 A'S)**:

i. ACCESSIBILITY: It is necessary that access to the formal payment systems is made as easily available to all, as is the case with cash. Institutions and stakeholders must invariably focus on their own strengths and convenience of their products to make them more accessible.

ii. AVAILABILITY: Availability of the modern payment systems beyond the banking relationship has now been made possible through non-bank entities as well after the enactment of the Payment and Settlement Systems Act, 2007.

iii. AWARENESS: The usage of a payment product is dependent on the customer being aware of the existence of such a product and its use as also the safeguards against its misuse. Therefore, it is necessary that awareness of various payment products is created through the innovative use of available mass media.

iv. ACCEPTABILITY: Availability and awareness of payment products will not lead to increased usage unless the payment product is accepted by all. The acceptability of formal payment channels including e-payments is based on the ease of use, convenience, interoperability, language neutrality and incentive factors associated with the particular mode of payment. Thus, a multi-pronged strategy is required to increase the acceptability of payment products.

v. AFFORDABILITY: The payment services, including the e-payment option, should be affordable to all segments of the society. Effective technology deployment and incentive structure should result in the creation of low cost payment products that encourage all customers and users towards their repetitive usage and cut down their dependency on cash.

vi. ASSURANCE: It is an aspect which is related to trust in the products and processes and the security and authenticity relating to the transactions. For non-cash payments to proliferate, they should provide a high degree of comfort and offer an appropriate level of security in their repeated and regular usage with a zero-fail rate.

vii. APPROPRIATENESS: Appropriateness is the combined effect of all the above features. The payment products should adapt to the social and cultural milieu and meet the needs of existing and prospective customers.

GOVERNMENT'S ROLE

In this endeavour, the role of the Government would be very crucial and significant. The intention of the Government to effect subsidy payments electronically, rather than through cash transfers, is a major step in this direction. As indicated above, the continued year-on-year growth in electronic transactions is likely to encounter a huge exponential rise in volume when electronic benefit transfers and direct transfers of subsidies from the government to the beneficiaries take place in an electronic mode. The systems have to be geared up and the reach expanded to serve the growing payment needs which would arise from this concerted move towards electronic payments.

The UIDAI is providing Aadhaar numbers to all residents of India. The overlay of Aadhaar technology on top of the existing payment system infrastructure is one of the ways to address identity and address proof requirements. Similarly, the Aadhaar authentication (finger print, iris) services could enhance the security for payment transactions. Additionally there are other developments on account of new technologies, new business models, changing demographic profiles and societal factors which are of relevance to the payment and settlement systems of the country.

NEW VISION DOCUMENT

Further to Vision Document 2012-15, RBI is likely to release a new vision document for the development of payment systems in the country, which will spell out the broader direction of regulation. RBI will publish Vision 2018 for payment and settlement systems in the country by April-end 2016. Vision 2018 will continue to focus on migrating to a less-cash and more digital society. The idea is to make regulations more responsive to technological developments and innovations in the payment space. This will be complemented by enhanced supervision of payment system operators, improvement in customer grievance redressal mechanisms and strengthening of payment infrastructure.

Work is underway, though the timeframe of the new document was yet to be decided. The RBI has been bringing out such vision documents for payment systems since 1998 and they have been covering a period of three years each.

A cashless society would soon be inevitable, and digital currencies would drive that change. More and more usage would only mean wider acceptance and down the line, these currencies will ensure the challenges being addressed and resources being distributed well among various classes of the society.

(Extract from Payment Systems in India: Vision 2012-15, Department Of Payment and Settlement Systems, RBI)

The role of technology in the future of Electronic Money

Technology has enhanced, eased and changed the way monetary transactions are done and this is in fact, the reason why digital currency and payment gateways are becoming the norm. Technology allows transactions to take place quickly, without the hassles of finding the right change or restrictions to a particular currency. It is the deployment of technology that allows users to transact instantaneously, track their transactions, and feel confident that their transactions are safe and secure. Electronic money also removes some of the high fees, reduces costs and the time consuming aspects associated with money transfers at the bank. We are in an era where contactless payments are the norm.

The future of money is electronic – and it is technology that has created this synthesis. Electronic money, or more accurately, electronic payment methodologies that replace cash and physical currency, has been around for a while, but with the leaps and bounds in technology over this past decade, there has come about a shift in the way we think of the term "money", with electronic, non-traditional cash becoming more and more prevalent. Whether it is paying for one's lunch order, shopping for groceries or clothes (online or in-store) or having certain online-only experienced purchases, like downloading songs or movies or books, payment is not with cash, but with electronic funds. In fact, over the last couple of years, the financial summary of entire countries' treasuries has become predominantly electronic and digital, and not hard-cash or bonds based – out with the paper, in with the technologically created, cashless payments!

ARINDAM MUKHERJEE
Director, Banking & Financial Services, Cisco India & SAARC

KNOW YOUR ELECTRONIC MONEY

Electronic money encompasses a lot of payment methods, from the now standard card payment, to the latest trend of crypto currency. One of the earlier forms of electronic payment that is widely prevalent, is payment via a card, which includes both debit and credit cards. E-banking came next – fund transfer and payment through banks. NEFT completed a decade in existence in November 2015, and its siblings RTGS and IMPS are also in widespread use today. Online payment services made their appearance next. PayPal one of the early movers in this space, is actually almost two decades old, but its India operations are rather recent. Today we are seeing quite a few players, with more emerging as the technology advances and innovations happen, in the online payment and mobile wallets space. Apple Pay, Android Pay, Samsung Pay, Vodafone's M-PESA are all instances of big names. Paytm and MobiKwik are the country's top two mobile wallet service providers, with recognized names like PayUmoney, Citrus Pay and Freecharge also offering payment gateways that facilitate electronic money usage and cashless transactions for today's consumers. Crypto currency – mining-based internet currencies where encryption is used to regulate the generation of currency units, are the new kid on the block in the digital currency space, with Bit coin being the best known amongst players (others include Lite coin and Doge coin). The technology this rides on, blockchain, is the major technological innovation that Bit coin brought to the table for the finance sector.

> The next step in electronic payment systems should be a single, unified system, that combines the features and benefits of the current payment systems in a universal system accessed by all.

WHAT TECHNOLOGY HAS DONE FOR ELECTRONIC MONEY

Apart from being the medium through which digital money came about, technology has enhanced, eased and changed the way monetary transactions are done, and this is in fact, the reason why digital currency and payment gateways are becoming the norm. Technology allows transactions to take place quickly, without the hassles of finding the right change or restrictions to a particular currency. It also allows users to track their payments in real time, and in a mobile manner – using SMS, apps, and payment gateways. Need to pay your share of last night's dinner bill? All it takes is a couple of clicks and you can send money to the person; same goes for paying a telephone or cable television bill – as all the mobile wallet adverts tell us. It is the deployment of technology that allows users to transact instantaneously, track their transactions, and feel confident that their transactions are safe and secure. Electronic money also removes some of the high fees, reduces costs and the time consuming aspects associated with money transfers at the bank. We are in an era where contactless payments are the norm. Most mobile wallets and payment gateways have apps that can be downloaded and made use of, increasing the ease and facility of transacting with digital currency. In countries where banks are inaccessible to parts of the populace, or where due to lack of secure

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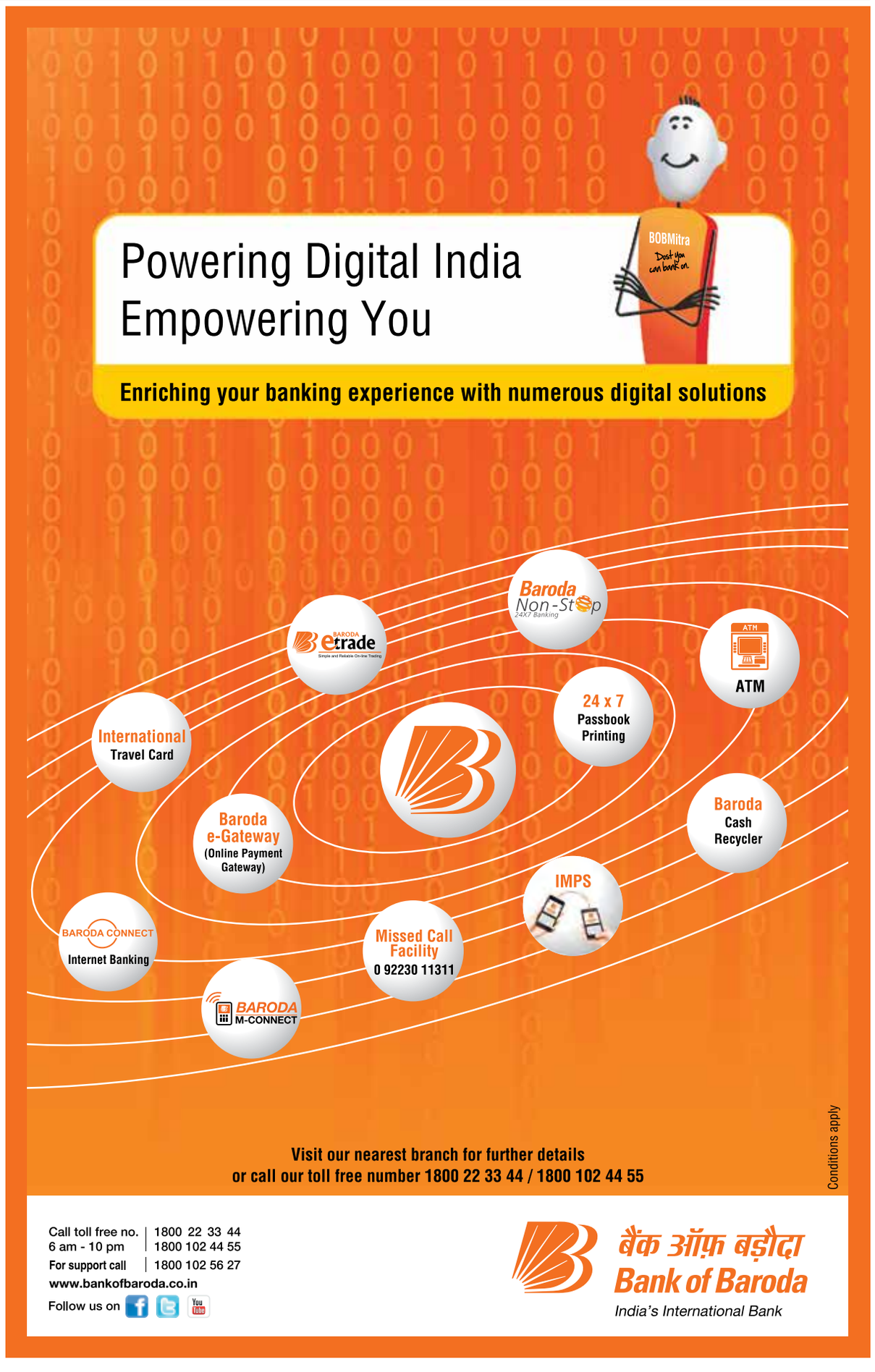

ELECTRONIC MONEY
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COMMERCIAL FEATURE

THERE IS A PARADIGM SHIFT IN THE DIGITAL PAYMENT SECTOR OVER THE YEARS

The digital payment sector has witnessed a paradigm shift over the years. Today online transactions not just being restricted to online retail or travel, consumers are looking for convenience and ease of access for products and services at all times and through e-wallets, as it makes their life easy. Having pioneered the 'less cash' drive for the Indian economy back in 2006, ITZ Cash is today the largest and most trusted payment solutions company, with sizeable opportunities in the space. We spoke to Naveen Surya, the following is the excerpts of the interview.

Electronic payments are set to take off in a major way in India in the coming years? How do you think will this impact the financial sector and the e-commerce in particular?

Amicable policies, changing customer preferences, and a strong government backing has principally revolutionised the digital payments ecosystem in India. Now with the launch of unified payment interface (UPI) the country has moved a step closer towards transforming itself to a cashless economy.

With over more than 250 million internet users there is a remarkable growth in the e-payments segments. We can see more of SME's and Start up companies emerging in India over a period of 5 years which will intensify the thrust further.

We have been in this industry for more than a decade now and have witnessed the system transforming from a pure off-line model to an on-line digitized model and the transparency, efficiency and robustness that have come in its wake in the financial services sector as a whole has been enormous. But, what bothered us was the fact that unless the entire population is able to make use of the medium, there would not be any real benefit that would accrue to the country, and our sustaining efforts would be towards achieving that.

Where do you see electronic payments system headed in the medium to long-term in India?

There is a paradigm shift in the digital payment sectors over the years. Online transactions are not just restricted to online retail or travel. Consumers are looking for convenience and ease of access for products and services at all times and through e-wallets, it makes their life easy. With India witnessing a potential growth in the area of digital payment, there is an ever increasing mobile penetration in the market. Mobile payments in India are estimated to grow from $86 million in 2011 to $1.15 billion in 2016, with a compounded annual growth rate (CAGR) of 68 per cent, according to estimates. The consumer payments industry will play a crucial role in the future growth of digital payments in the country. The value added services provided by the e-commerce companies to their customers also plays a prominent role in this segment.

Electronic ticketing has been a key beneficiary of the electronic payments segment. While online bookings account for 60-65 per cent of all air tickets in India.

What role can the regulator, the RBI and the government play in this regard?

Fundamentally the true competition for digital money within the consumer world is 'cash'. Also it needs to be realized that the rift between the physical and digital eco-systems is almost irreplaceable considering

NAVEEN SURYA,
Managing Director,
ItzCash Card Ltd.

the nature of cash, its powerful alignment to the centre, the RBI which issues it and the backing it receives from the government. Addressing this concern, the RBI can look at setting up a digital money issuing or an e-currency infrastructure which would be at par with cash and regulated just like cash. This would gradually bring in the parity between money and currency with something that we may address as e-currency. The government should also plans to do away with the convenience fee charged for online utility bill payments which is another encouraging move towards going cashless.

Apart from promoting the usage of digital money, it is also important that the government disincentivise the usage of physical cash by altering the conventional usage pattern.

What is the contribution of ITZ Cash in the e-payments space and how has it grown over the years? How has been your experience?

Having pioneered the 'less cash' drive for the Indian economy back in 2006, we started with a vision to become the largest and most trusted payment solutions company, with sizeable opportunities in the space. We were amongst the first ones to acquire a license under the Payments & Settlements ACT ' 2007 for issuing prepaid payments instruments.

We started our journey with brands like Dish TV, IRCTC and Utility payments as a segment. With payment volume of 500 crore a decade down the lane, we have grown exponentially and crossed a whopping Rs. 50,000 crore worth of cumulative gross payment volume for all bill payments done by the company till date.

We have now also added corporate gifting, Telecom/ DTH recharge, cash in business, energy, direct money transfer, and other Strategic tie-ups (Uber, Flipkart, Book My Show etc) with a processing payment volume of 12000 crore for the fiscal 2015-16. Our revenues have been growing at 70% YOY consecutively for the past 3 years. We have also started International Money Transfer with Thomas Cook and now we are aiming to take the fintech business & distribution of other related financial products aggressively this fiscal and in the coming years.

We strongly believe that our 10 year journey has built a strong omni-channel, omni-product base across India, with a wide network of 75000+ ItzCash world outlets, 110 million wallets transacting 500,000 times a day using ItzCash for their retail payments, reach across 3000+ towns / cities across all districts in the country, making us the country's Digital Cash.

What are some of the areas you are working on?

We service customers across all three segments of banked, under-banked and unbanked. Our strategy to acquire all these segments, however, is completely different. We have been acquiring the banked customers through our corporate programs and solutions, Under-banked and unbanked consumers are those whom we acquire through our omni-channel approach both in digital and physical space i.e. on web/mobile in digital space and at retail outlets across the country with our physical network. We also provide our customers with railway bookings in IRCTC and we democratise their online ticketing services from limited debit/ credit card consumers to consumers across segments and geographies. We continue to be the largest non-bank partner for IRCTC with approximately 12% market share in travel services.

BHARAT BILL PAYMENT SYSTEM

Bill payment is a major component of the retail payment transactions. The Committee to study the Feasibility of Implementation of GIRO based Payment Systems (Chairman: Shri G. Padmanabhan, Executive Director, RBI) (2013) had estimated that over 30,800 million bills amounting to Rs.6223 billion are generated each year in the top 20 cities in the country. Though various forms of payments are accepted, cash and cheque payments continue to be predominant, particularly at the Billers' Own Collection Point. While the existing systems are safe and robust, they do not fully address the needs of the consumers/customers to pay a variety of bills including utility bills, school/ university fee, municipal taxes, etc. due to the lack of interoperability in the bill payment processes as well as the lack of access to various modes of electronic payments by a vast majority of customers.

There is, therefore, a need for an integrated bill payment system in the country that offers interoperable and accessible bill payment services to customers through a network of agents, allows multiple payment modes, and provides instant confirmation of payment. The bill payment system should also serve as an efficient, cost effective alternative to the existing systems, thus, setting the standards for bill payments in the country. The Bharat Bill Payment System (BBPS) in the country is the answer to the above need.

The BBPS will function as a tiered structure for operating the bill payment system in the country with a single brand image providing convenience of 'anytime anywhere' bill payment to customers. The centralised bill payments infrastructure will consist of two types of entities carrying out distinct functions –

(i) Entity operating the BBPS the standard setting body, which, inter-alia, will cover standards related to payment, clearing and settlement process and

(ii) Bharat Bill Payment Operating Units (BBPOUs), which will be the authorised operational units, working in adherence to the standards set by the BBPS. The tiered structure could be further strengthened through an effective establishment of agent network/s by the BBPOUs.

The comprehensive bill payment system will connects multiple billers who will accept online payments for their products and services. The soon to be launched BPPS in the first half of July will enable customers to use various ways of online payments. In case of those who do not have access to internet or do not use the internet to make payments, they can visit any physical touch point belonging to any entity with a licence to operate a BBPS unit which will be operated and managed by the NPCI.

Game of Coins

...Continued From Page 3

cerns that have come up time and again. The Bitcoin was one of them. While history will look at it as an incredibly successful experiment in technological disruption, its working algorithm allows only a fractional currency to be paid once the system validates the transaction. Unfortunately there is no scalable mechanism in place either. However, the real deal lies in the underlying technology of bitcoins, the blockchain. It has caught everyone's attention, and is also being termed as the, "next big thing" in the banking industry. Experts believe that by 2020, 20% of the GDP will rest on blockchain based applications. It is seen as a disruptive force in finance by major institutes like Citigroup, Barclays, and UBS Bank, who are already exploring blockchain technology for cross-border payments.

WHAT IS BLOCKCHAIN?

A blockchain is a peer-to-peer distributed ledger technology that maintains a continuously growing list of records hardened against tampering and revision, enabling the (unknown) participants to securely and reliably transact (among each other) without a central authority.

IBM'S CONTRIBUTION

'Open Blockchain' is IBM's open source contribution to the Linux Foundation's Hyperledger Project, a collaborative effort to create a Blockchain for businesses as a broad, and cross-industry and open source approach. IBM recently also announced a new framework for securely operating Blockchain networks to help speed the adoption of Blockchain for businesses. Open Blockchain extends traditional Blockchain technologies by incorporating features like confidentiality, verifiable identification, private transactions and customizable consensus protocols. Built-in permissions allow all participants to see entries that are 'relevant' or 'permitted'. In addition to this, it is possible to de-anonymize a particular transaction if all stakeholders involved are in consensus as all identities are provable and unique on Blockchain with secure cryptographic techniques. Thus, the financial sector is booming with innovations, which are making things easier and more efficient, while ensuring security at every step. It is the era of disruption in the finance.

*(By **VISHAL S BATRA**, IBM Researcher and Praveen Jayachandran, IBM Research Scientist and Manager)*

The role of technology in the future of Electronic Money

...Continued From Page 3

methods of saving or storing money, electronic money has become the norm and eased lives, as well as created new sources of livelihood.

THE FUTURE OF ELECTRONIC MONEY

We are moving towards becoming a cashless society, world-wide. This is no trend or fad among the youth that will burst – it will reach across all age groups and become the norm. Electronic money will also make currency borderless - while there are some possibilities that already exist, the day is not far when money can be sent between countries by individuals living far from home, seamlessly and instantaneously. The next step in electronic payment systems should be a single, unified system, that combines the features and benefits of the current payment systems in a universal system that can be accessed and used by all. Furthermore, by digitizing all monetary assets, another future move that will come to pass, contracts can become purely online and smart. When you have the ability to dictate the terms of conditions of money – or make it programmable, it opens a whole new window of opportunity for fields like real estate (escrow accounts) and corporates (multisig features). So clearly, the opportunities are many, and the technology is at a stage where it can support newer and better ways of transacting. Digital money makes for a more flexible and much more secure and private way of conducting financial transactions. The future awaits – and we will watch as we progress down the path to cashlessness.

PoS set to grow exponentially

India will need 20 million (point of Sale) PoS terminals as against the current 1.2 million as per RBI. There is need for increasing the number of alternative delivery channels in rural areas, as banks are more focusing mainly in metropolitan and urban centres. The proliferation of digital channels is evident mostly in the Tier-I and Tier-II centres of the country. Digital channels must be available in Tier-III to Tier-VI centres as well. It is of critical importance that the population in over six lakh villages in the country is exposed to the alternate delivery channels.

The PoS terminals are used for facilitating debit and credit card transactions. The payments landscape in India is changing fast and in order to reach out to all segments of the society, Interoperability is the key and a critical ingredient to evolving larger payment ecosystems.

While government policies and macro economic conditions act as catalysts, technology plays a pivotal role in revamping the sector towards fast-track development. Thanks to advancement in Point of Sales (PoS) technology, sales counters across India are witnessing complete makeover with traditional retail giving way to organized business environment clocking exponential growth. Automating operations by brick-and-mortar businesses with cashless transactions for enhanced customer experience is gaining ground across Indian cities.

RBI has relaxed rules to allow cash withdrawals through PoS machines across India which will enable growth in the demand for PoS machines in the coming year. Also with India having more than one billion mobile connections, the retail payments in the next five years would be increasingly driven through mobile payments.

Riding on POS technology, Indian retail sector is set to make new strides in the coming years. POS is one of the major growth ingredients for retail sector. With government opening up FDI in retail sector and Goods and Service Tax (GST) Bill likely to become a reality in 2016, the POS market growth will be boosted exponentially.

Many state governments have started introducing hand held POS machines at their fair price shops too.

THIS SPECIAL FEATURE IS CONCEPTUALISED AND EXECUTED BY

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ENORMOUS LATITUDE FOR MOBILE WALLETS

Mobile wallets will play a significant role in day to day life as an increase in use of smartphone can be seen and people are relying on digital lifestyle to make things convenient and fast. India is likely to see the emergence of 300-400 million new customers who will have smartphones and bank accounts, regular direct benefit transfer flows in their accounts, and an Aadhaar card in the coming months. These new customers will be looking for payment instruments to participate in commerce and their expectations will be very different from the current structures and offerings. Merchants are also increasingly engaging with customers on new platforms, including social media, in an attempt to take the experience to a higher level.

The introduction of mobile wallet has made it extremely convenient to do cashless transactions and today there are a number of companies in India offering consumers the mobile wallet services. Technological advancements have made things easier and the smartphone has become a gadget to conduct transactions - Be it ordering food or groceries, booking a cab or movie tickets, with the help of mobile phone one can do everything.

Convenience and speed of doing the transaction are the key benefits. Mobile wallet users enjoy greater flexibility in making secure payments. The convenience of making payments on the go and easy accessibility of this new mode of payment makes it a logical and natural choice. Additionally, those who don't have a credit card or a debit card can go to their nearest wallet recharge kiosk and get their wallets loaded against cash. Mobile wallets can do everything that cash or card can do and in a better way.

Globally "cashless" transactions have been growing rapidly, the industry has made inroads in many countries in the last five years. Companies have already put their own solutions in place. With over a dozen players, India's mobile payment ecosystem too is not an exception, having witnessed a steady growth as users have realised the benefits of technology in online payments space, more so in mobile wallets.

SO HOW DOES A MOBILE WALLET OR RATHER DIGITAL WALLETS WORK?

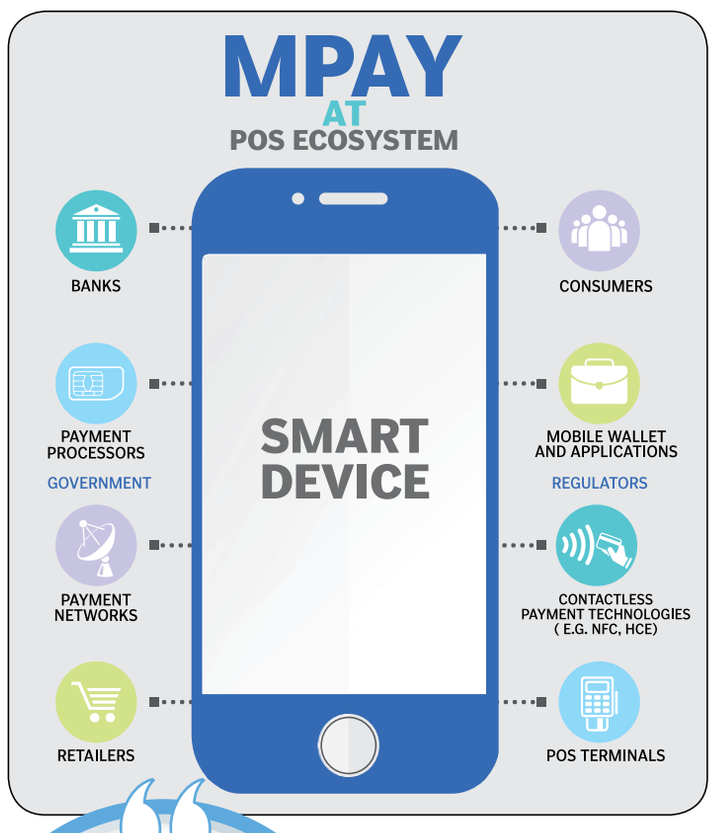
Mobile wallet is a service which is often confused with mobile banking. Mobile wallet has a much broader concept which includes using a mobile phone as a mode of payment, rather than depending on hard cash or debit/credit cards. In mobile prepaid wallet, costumers do not require to follow the three layers of security for payment which are required while using a debit/credit card or through net banking. Wallets are one click payment solution. This leads to more success rate of payments when compared to transactions through debit/credit card.

All one needs to do is preload money and he or she can then use it to pay for services or transfer it to other accounts. With the new payment banks coming in companies offering digital wallets are set to play a significant role in furthering financial inclusion. As per the RBI directive, telecom operators, supermarket chains, electronic wallets and prepaid instrument players can open payment banks to accept deposits, offer basic saving facilities and provide remittance services for millions of people who are currently out of the digital financial system.

As per the RBI, there are three kinds of e-wallets-closed, semi-closed and open. A closed wallet is one that a company issues to its consumers for in-house goods and services only. These instruments do not carry the advantage of cash withdrawal or redemption. It is basically an account where money gets credited in case of a refund due to cancellation or return. A semi-closed wallet can be used for goods and services, including financial services, at select merchant locations or establishments that have a contract with the issuing company to accept these payment instruments. Semi-closed wallets do not permit cash withdrawal or redemption by the holder as well. Finally, open wallets can be used for purchase of goods and services, including financial services such as funds transfer at merchant locations or point of sale terminals that accept cards, and also cash withdrawals at automated teller machines or business correspondents. These kind of wallets can only be issued by banks.

FUTURE OF MOBILE WALLETS

India is a unique mobile market and one where the mobile ecosystem is playing a hugely influential role in transforming the lives of its citizens, and driving economic growth. The increasing adoption of smartphones has been fuelled by a raft of low-cost smartphones from both international vendors and, increasingly, via a home grown smartphone manufacturing ecosystem. Under the government's "Make in India" initiative, many international brands have set up manufacturing facilities in India. More than half a billion new smartphones connections (new SIM cards registered and used in a smartphone) are expected in India between 2015 and 2020, bringing the total to 690 million, up from 149 million in 2014.



> Mobile wallet users enjoy greater flexibility in making secure payments. Mobile wallets can do everything that cash or card can do and in a better way.

The mobile economy or value of all transactions that happen on mobiles across sectors, has become a key driver of economic growth and job creation in the country. It made a total contribution of Rs.7.7 lakh crore ($116 billion) to the Indian economy in 2014, equivalent to 6.1% of India's total GDP (gross domestic product). This contribution is forecast to almost double to Rs.14 lakh crore by 2020, which would represent 8.2% of projected GDP by that point.

Although there is not 100% penetration of mobile wallet yet, it still holds immense potential. Mobile wallet will play a significant role in day to day life as an increase in use of smartphone can be seen and people are relying on digital lifestyle to make things convenient and fast. India is likely to see the emergence of 300-400 million new customers who will have smartphones and bank accounts, regular direct benefit transfer flows in their accounts, and an Aadhaar card in the coming months. These new customers will be looking for payment instruments to participate in commerce and their expectations will very different from the current structures and offerings. Merchants are also increasingly engaging with customers on new platforms, including social media, in an attempt to take the experience to a higher level.

Mobile wallets are a good alternative to cash-on-delivery. Indian eCommerce companies prefer to settle refunds to its customers through wallets. However for mobile wallets to succeed e-wallet should address its users as well as merchants needs (such as convenience, security concerns and a merchant-user end to end relationship), only then will there be a true adoption of wallet in this country.

The mobile wallet service providers are required to differentiate their strategy to increase their customer reach. Indian banks have excellent mobile wallet services for their customers, and are ensuring that they remain key players thereby protecting their customers base. On the other hand there is a need for mobile operators to widen their services and influence the existing services to attract new customers and maintain their present customer base.