



A RESEARCH PAPER ON "ELECTRONIC MONEY AND PAYMENT SYSTEM: INDIAN PERSPECTIVE"

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Introduction

Money is widely accepted medium of exchange, a store of value, and a unit of account. It forms the basis for a smooth function of market system. Money is fungible: there is a tendency for older forms to take on old roles. With the advent of Internet and Electronic Commerce, we are in the process of shifting significantly from paper currency to electronic cash. Stored-value cards with an embedded micro chip that stores money in digital form may become a customary circulating medium along with privately supplied digital cash stored in computers hard drives. These can be used over the Internet to facilitate new age commerce²¹⁹. The transition from a paper-based monetary system to an electronic payment system will reduce transaction costs, expand markets, and empower individuals. The rules that govern the new monetary universe will have to be transparent, equally applied, and consistent with individual freedom if people are to have trust and confidence in cyber money and cyber commerce. The days of cash in form of notes and coins are probably numbered. It is expensive to handle (expenses include risk both banks and merchant incur). This type of cash is also becoming increasingly easy to counterfeit at low cost, particularly given the quality of output that can now be produced by inexpensive colour photocopies. It is obvious. That traditional cash also fails miserably as a medium of exchange for parties who are not in each other's presence at time of sale. As money technology has evolved, methods of payment have also changed, but cash still often remains a preferred method of payment by many people. Over the past few decades various media and industry experts have predicted the demise of cash and the advent of the "cashless" society.

Electronic Money

Electronic money is nothing more than the replacement of physical cash in the shape of coins and banknotes with an electronic equivalent. According to Wikipedia, digital cash is: "A system that allows a person to pay for goods or services by transmitting a number from one computer to another. Like the serial numbers on real dollar bills, the digital cash numbers are unique. Each one is issued by a bank and represents a specified sum of real money. One of the key features of digital cash is that, like real cash, it is-anonymous and reusable."

From this definition it is obvious that electronic money is very much like physical money for all practical purposes. It is anonymous; it is given value by a financial institution; and it must be used to pay for goods and services in any sort of transaction. The new electronic Money Institutions European Directive—which will be discussed in more detail later also defines electronic money for the purpose of the legal regime that will regulate -this emerging sector. It states that: 'Electronic money' shall mean monetary value as represented by a claim on the issuer which is:

A. Dom, "The future of Money in the IT Age"

(i) stored on an electronic device;

(U) Issued on receipt of funds of an amount not less in value than the monetary value issued;

(Hi) Accepted as means of payment by undertakings other than the issuer.

This definition is wide ranging, and attempts to be technology neutral. The requirements for a payment system to be considered electronic money are all there.

Development of Payment System

Markets of any sort involve transactions. These transactions usually end up in the seller being paid by the buyer. Until then, the whole transaction remains uncertain - the longer the delay is between undertaking to pay and actual payment, the greater is the uncertainty. The internet offers the prospect of a highly cost effective payment system for low value transactions. Technology is able to offer nearly instantaneous settlement of transactions. In order to achieve such an objective, security issues will need to be successfully addressed without losing all of the benefits that accrue from internet's open structure.

In late 1990s, the technologies related to electronic money like electronic checks and embedded smart cards used the public key cryptography for transferring money. With the advent of e-mail, the transactions of electronic money started increasing. People started sending their credit card details via e-mail to buy goods. Later, the customers started having an online account to avoid transaction fees. Nowadays, the use of electronic money is possible due to cryptography and digital signatures. Public key encryption and decryption together are called public key cryptography. The public key encryption, involves two keys, viz. public key and private key to authenticate the identity of an entity, electronically. As the name suggests, the public



key is published and the private key is kept secret. Data is encrypted with the public key and the same data is decrypted with the corresponding private. Digital signatures are used when you are encrypting some important information that is to be kept confidential. Digital signatures involve the use of hash table that encrypt a hash using the private key and decrypts the hash using the private key.

Existing Methods

The definition of electronic money is so broad as to include any sort of electronic device to store monetary value, the methods of electronic money are only limited to the existing technology. At present there are two main storage methods for electronic money, by software and by cards! The most viable and promising electronic money system is that of storing monetary value in secure cards with microchips, known as smart cards. The smart card is simply put, "a plastic rectangle containing an electronic chip, and holding a certain amount of readable data." This technology is not only circumscribed to electronic payment systems, it is also to be found in several other areas such as digital television boxes and Subscriber Identity Module (SIM) cards for mobile phones. Smart cards for electronic payments use the chip to store certain amount of value, which can be charged in anything from a public phone to an Automated Teller Machine (ATM). For security reasons, the information in the card must be stored by use of encryption algorithms that can only be decoded by an adequate reader; otherwise the value from the card cannot be unlocked. The bearer will present the card to a retailer that has a card reader, and the value will be then unlocked and transferred to their account. This value is redeemable with the card issuer. Smart cards can also be used for Internet transactions if the consumer has a card reader attached to their computer, this area will unlock the value in the card and send the information to the online retailer.

Potential Beneficial Effects of Electronic Money

First, digital cash will make transactions less expensive because the cost of transferring (digital cash via internet is cheaper than through the conventional banking system. To transfer money in traditional way, conventional banks maintain many branches, clerks, automatic teller machines and specific electronic transaction system. Over head cost of all this bureaucracy is generated in part from less for money transfers and credit card payments. Since digital cash uses the existing Internet network and the specific computers of its users, the cost of digital cash transfer is much lower. Second, since the Internet has no political borders, digital cash is also borderless. Thus, the cost of transfer within a state is almost equal to the cost of transfer across different states. The cost of international money transfer, now much higher than transfer within the states, will be reduced dramatically. Third, the digital cash payment potentially can be used by anyone with the access to the Internet and Internet based banks. While the credit cards payments are limited to authorised shops, digital cash makes person to person payments possible. Thus, even very small business and individuals can use digital cash for all sorts of transaction. The consequences of these effects are enlargements of new business opportunities and an expansion of economic activities on the Internet. Even small business organisations can trade with customers all over the world.

1.2 Consumer Convenience

Electronic money could prove very convenient for consumers. Because it involves advanced charge of money from the owner's bank account, almost anybody can be supplied with a smart card, as there is no risk to the issuer. Consumers will also find it useful to have to do without carrying cash for small transactions, such as bus fares.

1.3 Increased Consumer Confidence

Because a smart card only holds the amount of money that the bearer has placed on it, consumers will be more willing to use it to purchase over the Internet without fear of somebody else misusing the payment information, as happens with credit card fraud. Some of the schemes are also being issued with a built in locking code, which will allow users to lock the cash on a card, making sure that if the card gets lost or stolen another person will not be able to use the money.

As it has been mentioned, this system is much cheaper to operate than other payment models, which is a great advantage for issuing institutions. The liability for the issuer is also minimal, reduces costs and enhances profits.

e-money, there is anonymity. It is not the same case with liquid cash or credit and debit cards. E-money transactions mostly happen on the Internet through an online gateway where the identity of the payer is secured and behind the screens. The person on the other side the payment from the payer but does not necessarily know the identity of the person the money paid.

1.6 Record of Transactions

Each and every transaction made with electronic money is recorded in the bank's and the user's online records. These



records have all the essential information about the transaction the name of the payer, the name of the receiver, the date, place and time it took place. This makes it more dependable, and users can access their record of transactions at any time of the day.

Possible Obstacles of Electronic Money

In spite of the benefits of electronic money, uncertainties on the path of consumers and merchants about the underlying technology may well slow widespread acceptance of such systems. Security, the need for hardware and software infrastructure as well as the fact that innovations are fast paced creating doubts about how long any technologies will be in used are some of its uncertainty. Digital cash means that issuers will have to overcome not only distrust of the security of digital medium and simple inertia, but also strong nationalistic trust in political currency.

2.1 Consumer Confusion

With three schemes competing to become the electronic money standard, there is a real possibility of the whole system becoming too complicated for users. One of the main problems with too many schemes would be that the user may not be able to use the card everywhere, which is what would be expected of a system that is meant to replace physical currency.

2.2 Transnationality

The most important character of electronic money is its not constrain by national borders. Users can purchase services and goods from any site anywhere on the Internet; banks can issue electronic money relative to any stable, real currency. Transnationality is a vital characteristic of this payment system. Digital cash will provide benefits and problems in the near future. It is the transnational character of digital cash that will open new business opportunities around the world but also bring great challenges for governments. The solution to these problems could lead to a controlled cyberspace, structures and regulation governing the use of funds. Alternatively, those who use it may regulate the economy of the Internet. Only time will tell.

2.3 Economical Effects

If electronic money is issued privately, it may be independent of government conditions. Such cash will consequently have a kind of monetary freedom. Conditions that make government-issued money credible do not apply to private-issued currency. Government-issued currency is the official currency of a given state, and is used, in spite of its. value, by the citizens of a given state. 2.3,1 Exchange rates.

New-age cash could well create great instability in exchange rates. Since it will, initially at least, be a proxy for real currency (electronic value is to be bought with real cash and may be redeemed for real cash), there has to be an exchange rate applied to it. There must be a foreign exchange market in cyberspace. If there is a great deal of digital speculation, it could lead to be the de-stabilisation of foreign exchange rates. Speculative behaviour could create the initial depreciation of any given currency and amplify general fluctuations in market. A so-called bubble effect could occur.

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The introduction of electronic money may affect the money supply in the real world. Those • , ^ new type of cash would deposit real cash in a bank and would request digital cash 'n exchange of it. If a bank issuing digital cash, by maintaining a 100% reserve system, the amount of digital cash will be fixed to the amount of real cash on deposit. In this case no new money will be created. However, if the Internet economy expands banks may soon choose to lead customers money in the form of digital cash. Banks will move to a virtual, fractional reserve system parallel to that found in real world. New money will be created. In other words, the total amount of digital money will exceed the amount of deposited real cash²²⁰. This development could mean that money in cyberspace will fluctuate with virtual economic activity, which in turn eventually has an impact on the real world's money supply. Suppose (he virtual economy expands leading to a temporary storage of digital cash, the demand for digital cash will mean the transfer of real cash into electronic banks. Cyberspace will take in the real cash and shrink the money supply in the real world.

UJ Financial Crisis

If banks start to create new money in the form of digital cash, there will be an opportunity for bankruptcies, the chain effect of which may easily lead to virtual financial crisis. In the real world, the risk is minimized by a safety net offered by the central banks or institution as the Deposit Insurance Corporation. In cyberspace, so far, there is. no central banking" authority that provides the equivalent of the safety net. It is possible that the default of one bank may lead to the defaults of other virtual banks. Customers may rush to their banks to demand a conversion of digital cash to real cash. If there is insufficient real fund on hand, there could be a serious financial crisis. In the absence of a virtual central bank, there is an increased risk of this sort of problem.



The Role of Government

There is considerable debate about what role governments should play in the transition to a digital world. Some argue that the government should play little, if any, role and allow the private sector to resolve most of the issues. Others advise the government to go so far as to set all the standards- for- issuing and using electronic cash, if not be the exclusive issuer of electronic cash. Still others recommend approaches that fall between those two extremes. Government must be careful not to overreact to, or stifle, new innovations that can greatly benefit the consumer and the economy and should take advantage of marketplace solution to issues where appropriate. The fact is that Cyberspace differs from our everyday world in that we receive force cannot be projected across a network. It is not possible, within the confines of the internet itself, to compel anyone to do anything. This is going to be treated as a grave threat by most national governments.

Revolutions in the form of money inevitably have political consequences. The development in modern banking and the concomitant erosion of the government's monopoly of money Creation played a significant role in the development of democracy. As electronic money

When the banks in cyberspace begin loans in digital cash, it will exceed reserved real cash (money creation). Matching the fluctuation of money demand in cyberspace, the internet will absorb real cash. This will affect the the real world could also threaten government control the lessons of history have great contemporary relevance.

3.1 R.B.I

The Reserve Bank of India is doing its best to encourage alternative methods of payments which will bring security and efficiency to the payments system and make the whole process easier for banks. The Indian banking sector has been growing successfully, innovating and trying to adopt and implement electronic payments to enhance the banking system. Though the Indian payment systems have always been dominated by paper-based transactions, e-payments are not far behind. Ever since the introduction of e-payments in India, the banking sector has witnessed growth like never before. According to a survey by Celent, the ratio of e-payments to paper based transactions has considerably increased between 2004 and 2008. This has happened as a result of advances in technology and increasing consumer awareness of the ease and efficiency of internet and mobile transactions.

In the case of India, the RBI has played a pivotal role in facilitating e-payments by making it compulsory for banks to route high value transactions through Real Time Gross Settlement (RTGS) and also by introducing NEFT (National Electronic Funds Transfer) and NECS (National Electronic Clearing Services) which has encouraged individuals and businesses to switch to electronic methods of payment. With the changing times and technology so have changed the methods of payments in India. E-payments in India have been growing at a fast rate of 60% over the last 3 years.

In India 'plastics' have been fast over-taking 'papers'. With 130 million cards in circulation currently, both credit and debit, and an increasing consumer base with disposable income, India is clearly one of the fastest growing countries for payment cards in the Asia-Pacific region. Behavioural patterns of Indian customers are also likely to be influenced by their internet accessibility and usage, which currently is about 32 million PC users, 68% of whom have access to the net. However these statistical indications are far from the reality where customers still prefer to pay "in line" rather than online, with 50% payments still being made in cash. E-payments have to be continuously promoted showing consumers the various routes through which they can make these payments like ATM's, the internet, mobile phones and drop boxes.

The Indian payments systems have however undergone a change with respect to methods of payments, there now being card-based payments, Electronic Funds Transfers, Electronic Clearing Services and ways to pay via the mobile and internet. In India payments can be divided in two ways- firstly, large-scale payments and small-scale payments and secondly, paper-based and electronic. Most large-scale payments concern corporate or government payments and are settled by the RBI. Small-scale payments are mainly retail payments concerning individuals which are generally paper-based transactions. Most large-value payments are handled electronically. However, even the retail payments are showing a tendency of shifting to the e-payment mode, mainly because of consumer awareness and regulations by the RBI.

RBI in Encouraging Electronic Payments

As the apex financial and regulatory institution in the country it is compulsory for the RBI to sure that the payments system in the country is as technologically advanced as possible and "n view of this aim, the RBI has taken several initiatives to strengthen the e-payments system in India and encourage people to adopt it.

The Payment and Settlement Systems Act, 2007 was a major step in this direction. It enables the RBI to "regulate, supervise



and lay down policies involving payment and settlement space in India." Apart from some basic instructions to banks as to the personal and confidential nature of customer payments, supervising the timely payment and settlement of all transactions, the RBI has actively encouraged all banks and consumers to embrace e-payments.

- In pursuit of the above-mentioned goal the RBI has granted NBFC's (Non-Banking Financial Companies) the permission to issue co branded credit cards forming partnerships with commercial banks.
- The Kisan Credit Card Scheme was launched by NABARD in order to meet the credit needs of farmers, so that they can be free of paper money hassles and use only plastic money.
- A domestic card settlement company known as India pay has recently been started by the RBI, inspired by Union pay in China, which will be promoting the use of cards i.e. "Plastic money". Initially functioning as an NGO, India pay will focus on potential customers from rural and semi-urban areas of India. India pay will have a much wider coverage than Visa, MasterCard or American Express cards which have always been used for card-based settlements and might even pose a threat to them.
- The NREGA (National Rural Employment Guarantee Scheme) introduced by the Government will ensure rural employment in turn ensuring that the employees get wages. Each employee will have a smart card functioning as his personal identification card, driver's license, credit card which will also function as an electronic pass book, thus familiarising the rural populations with e-payments.

However, the Indian banking system suffers from some defects due to certain socio-cultural factors which hampers the spread of the e-payments culture even though there are many effective electronic payment channels and systems in place. Despite the infrastructure being there nearly 50% of all payments are still made in cash. The main reason for this apt they switch to e-payments comes from lack of awareness of the customer despite various efforts by the Government.

Electronic Payments in India: Imperatives

India's growing middle class presents Financial Institutions ("FI") a significant opportunity to link economically-desirable consequences and derive substantial revenue streams from new banking and payment products, channels and customer segments while rising to meet a developing market's consumer needs.

4.1 Imperative . 1: Developing the Infrastructure with Competition

The most critical factor hindering the adoption of electronic payments in India is the lack of a payments infrastructure that can support the emerging financial system. In India, the best model for success in driving electronic payments does not necessarily understand how another emerging market approaches payments. Rather it is looking to another industry that has achieved phenomenal success by deploying what may be a uniquely Indian strategy. For FIs, many lessons can be borrowed from the strategic playbook of India's telecommunications industry. Its meteoric rise - growing 52 percent annually for the period 2005-2010 — has made it one of the world's largest mobile markets. Understanding the growth of Indian telecom, achieved by leveraging a co-opetition approach, helps crystallize a development strategy for financial services to support the country's banking and electronic payments services. Co-opetition is a business strategy based on a combination of cooperation and competition, derived from an understanding that business competitors can benefit when they work together.

4.2 Imperative 2: Developing the Infrastructure to Correct the Market's Structural Imbalance

Situation in card issuance and payment acceptance is reflected in the imbalance between the number of payment cards in circulation and the number of acceptance points — merchant's — with POS221 terminals and ATMs — in India. This is a fundamental hurdle to growth in electronic payment usage and per-card transaction volume in the Indian market today. With approximately 10 bank branches per 100,000 adults, accessibility to banking services in India is extremely low in comparison to other emerging markets. In the near term, the country's largest bank, State Bank of India (SBI), plans to install more than 500,000 POS terminals within the next few years, nearly doubling the country's units. The vast majority of debit card transactions occur as ATM withdrawals as it is still easier to withdraw cash from ATMs than use cards at the myriad outlets operating without POS terminals. Even though today's POS card usage is low, spending with payment cards — credit and debit — is expected to continue climbing. Prepaid cards alone are estimated to reach at least \$9.9 billion by 2013 with Visa and MasterCard size estimates projected at \$65-90 billion over the next 4-5 years. This is a true testament to the strength of the market size and an indicator of its growth trajectory. Modernizing the infrastructure will help spur a growth cycle for the entire ecosystem in which the supply side of card accepting merchants develops in tandem with the demand side of consumers' increased appetite for electronic banking transactions.

4.3 Imperative 3: Government's Role in Creating Accessibility to Payment Services for AH

Today, a significant discrepancy exists between customer demand and payments acceptance infrastructure in India, which



entails distinguishing between usage and accessibility. The proactive role the Indian government is taking to help build the payments infrastructure is instrumental in bringing about change. Recognizing banking's infrastructure challenges; the government approved the Payments and Settlement Systems Act (2007), which provided the RBI's explicit regulatory control of all payments and settlement systems in India. The RBI's Payment Systems Vision Document outlines six key tasks required to position the country for growth in payments, which will in turn spur economic growth. Its stated mission is "to ensure that all the payment and settlement systems operating in the country are safe, secure, sound, 121 Point of sale (POS) (also sometimes referred to as point of purchase (POP)) or checkout is the location where a transaction occurs. A "checkout" refers to a POS terminal or more generally to the hardware and software used for checkouts, [the equivalent of an electronic cash register accessible and authorized." To this lofty vision, RBI created the National Payment corporation of India (NPCI). The NPCI's mandate is to be the primary agency for retail development: "to build-state-of-the-art, world class, customer-friendly electronic retail systems available and affordable to all around the clock. Evidence of progress toward NPCI's mission abounds, from government schemes, programs that encourage electronic payments and financial systems and products that reach beyond the metropolitan markets. One such example is the kisan card, which provides farmers with access to credit for their agricultural operation expenses, such as production and cultivation. India's geographic landscape, with all its limitations in physical and technological infrastructure, creates challenges for electronic payment systems providers in reaching a range of customer segments. In order to expand banks' traditional and alternative distribution channels beyond bank branches, an ATM and POS terminal, the RBI supports the recruitment in Business Correspondents (BC) by banks. BCs handle the delivery of cash and accept cash deposits, open new accounts and provide other services for rural populations where bank branch access is either limited or non-existent.

4.4 Imperative 4: Educating Indian Consumers about the Benefits of Electronic Payments

Consumers' existing cultural values and beliefs toward cash and debt could present challenges to the development of a mature electronic payments industry. Deriving from these traditional values is a persistent belief that non-cash based transactions bear a high-level of risk. However, there's evidence of changing consumer behaviour toward increasing adoption of prepaid and electronic payment mechanisms among Indian consumers, with consumers growing increasingly comfortable with the benefits of electronic payments. In fact, India's e-commerce market is growing by leaps and bounds — about 30 percent annually — with • online auction company eBay alone experiencing 60 percent year-over-year growth. In order for consumers to participate, online purchases must be made with either a prepaid, debit or credit card; or through PayPal which is linked to either a payment card or a bank account. Consumer education focused on the value of electronic payment mechanisms could facilitate the adoption of card based transactions. Education would promote and increase awareness about the benefits of card usage, including security, convenience and loyalty and reward programs. Ultimately, these efforts could encourage adoption of payment instruments, drive card activation rates and increase usage volume — all critical for realizing electronic payment transactions' potential.

Conclusion

There is no doubt that smart cards have an immense potential to become the largest method for payment in the world, eventually replacing physical currency. The law would appear to be ' taking this seriously enough in some countries, and it is encouraging that there are already enough regulatory efforts to attempt to make legal sense of this payment method. The potential advantages for consumers, merchants and financial services make electronic money the way to go in the future. Nevertheless, there cannot be any sort of complacency when trying to make this system as secure as humanly possible, the consequences otherwise would be terrible to consider. India's population is one of the world's largest, but its sheer volume of consumers alone cannot create a market without the proper infrastructure. From the outlined evidence and studies, it should be clear that electronic payments will experience exponential growth as India's technological and communications infrastructure begins to achieve higher standards. It is critical for the government to play a proactive role in advancing infrastructure and regulatory improvements in order to open up the market. India's payment infrastructure would ease access, promote card usage and trigger a much needed transformation of banking and payment services, enhancing the country's competitiveness as a global player and elevating the living standards of its citizens.