
CONCEPT AND SIZE OF ELECTRONIC PAYMENT

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INTRODUCTION

Today, many users make payments electronically rather than in person. Hundreds of electronic payment systems have been developed to provide secure Internet transactions. Electronic payment systems are generally classified into four categories: credit card and debit cards; electronic cash; micropayment systems; and session-level protocols for secure communications.

A secure electronic financial transaction has to meet the following four requirements: ensure that communications are private; verify that the communications have not been changed in transmission; ensure that the client and server are who each claims to be; and ensure that the data to be transferred was, in fact, generated by the signed author.

To meet these objectives, every electronic payment system developed depends on some type of encryption and/or utilization of digital certificates. Using an encryption algorithm, the plaintext (also known as the original text) is changed into cipher text, which is decrypted by the receiver and transformed into clear-text. The encryption algorithm utilizes a key, a binary number often ranging in length from 40 to 128 bits. After being encrypted, the information is considered to be coded and therefore "locked." The recipient uses another key to "unlock" the coded information, restoring it to its original binary form.

Two cryptographic methods used in electronic payment systems include the secret key (which uses the same key to encrypt and decrypt and is the fastest method; however, in the initial transmission to the recipient, the secret key is not secure) and the public key (which uses both a private and a public key).

In the latter, each receiver owns a secret private key and a publishable public key. In public-key cryptography, the sender finds the receiver's public key and uses it to encrypt the message, whereas the receiver uses the private key to decrypt the message. The important point here is that because key holders do not need to send their private keys to anyone else to have their messages decrypted, the private keys are not in circulation and therefore are not vulnerable to crack attacks. In short, the security of a cryptographic system rests with the secrecy of the key rather than with the secrecy of the algorithm.

A payment is the transfer of an item of some value from one party (such as a person or company) to another in exchange for the provision of goods, services or both, or to fulfill a legal commitment. In law, the payer is the party making a payment while the payee is the party receiving the payment. As payment is an integral part of mercantile process, electronic payment system is an integral part of e-commerce. The emergence of e-commerce has created new financial needs that in many cases cannot be effectively fulfilled by traditional payment systems. Recognizing this, virtually all interested parties (i.e. academicians, government, business community and financial service providers) are exploring various types of electronic payment system and issues surrounding electronic



payment system and digital currency. Some proposed electronic payment systems are simply electronic version of existing payment systems such as cheques and credit cards, while, others are based on the digital currency technology and have the potential for definitive impact on today's financial and monetary system. While popular developers of electronic payment system predict fundamental changes in the financial sector because of the innovations in electronic payment system. Therefore, electronic payment systems and in particular, methods of payment being developed to support electronic commerce cannot be studied in an isolation.

CONCEPT AND SIZE OF ELECTRONIC PAYMENT

The transfer of funds from one party to another over electronic media is known as electronic payment system. Payment systems that use electronic networks constitute a frequent practice in commerce and industry. In it's, most general form, the term electronic payment includes any payment to businesses, bank or public services from citizens or businesses, which are executed through a telecommunication or electronic networks using modern technology. It is obvious that based on this definition, the electronic payments are the payments that are executed by the payer himself, whether the latter is a consumer or a business, without the intervention of the other natural person. Furthermore, the payment is made from distance, without the physical presence of the payer and naturally it does not include cash.

LIMITATIONS AND SCOPE FOR FURTHER STUDY

This study is based only on secondary data. Further research can be done on the basis of primary data through a questionnaire filled by customers and merchants to know the depth of the different electronic systems, their authenticity and the significance of these instruments in e-commerce in the current scenario.

TRADITIONAL PAYMENT INSTRUMENTS AND LIMITATIONS OF SYSTEM

Payments are an essential part of doing business. The simplest and oldest form of payment is barter, the exchange of one good or service for another. A traditional process of payment and settlement involves a buyer-to-seller transfer of cash or payment information (i.e., cheques and credit card or money order). The actual settlement of payment takes place in the financial processing network. A cash payment requires withdrawals from payer's bank account or a transfer of cash to the seller. Non-electronic payment methods (such as, using cash, writing a cheques, sending a money order, or giving your credit card number over the telephone) have several limitations in e-commerce environment. First, cash cannot be used for transactions because there is no face-to-face contact. Second, if payment is sent by mail, it takes time for it to be received. Even if a credit card number is provided by phone or fax, it takes some time to process it. Nor it is convenient to have to switch from the computer to the phone to complete a transaction. Also not everyone accepts credit cards or cheques, and some buyers do not have credit cards or bank accounts with adequate facility. For all of these reasons, a better way is needed to pay in cyberspace or electronic payment systems.

INCENTIVES UNDERTAKEN BY GOVERNMENT TO PUSH DIGITALISATION:

- 1. 0.75 % discount on fuel:** The Government Petroleum PSUs shall give incentive by offering a discount at the rate of 0.75 per cent of the sale price to consumers on purchase of petrol or diesel if payment is made through digital means.
- 2. POS machines in villages:** To expand digital payment infrastructure in rural areas, the Government through NABARD will extend financial support to eligible banks for deployment of 2 POS devices each in 1 lakh villages with population of less than 10,000. These POS machines are intended to be deployed at primary cooperative societies/milk societies/agricultural input dealers to facilitate agri-related transactions through digital means. This will benefit farmers to transact cashlessly in their villages for their agricultural needs.
- 3. Rupay Kisan Cards for farmers:** The Government through NABARD will also support Rural Regional Banks and Cooperative Banks to issue “Rupay Kisan Cards” to make digital transactions at POS machines/Micro ATMs/ATMs.
- 4. Buy railway tickets online:** Railway through its sub urban railway network shall provide incentive by way of discount up to 0.5 per cent to customers for monthly or seasonal tickets from January 1, 2017, if payment is made through digital means.
- 5. Free accidental insurance:** All railway passengers buying online ticket shall be given free accidental insurance cover of up to Rs 10 laky. Due to this, nearly 14 laky railway passengers are buying tickets everyday out of which 58% tickets are bought online through digital means.
- 6. Incentives for railway passengers:** For paid services e.g. catering, accommodation, retiring rooms etc. being offered by railways through its affiliated entities/corporations to the passengers, it will provide a discount of 5 per cent for payment of these services through digital means.
- 7. Discount on policies sold online:** Public sector insurance companies will provide incentive, by way of discount or credit, up to 10 per cent of the premium in general insurance policies and 8 per cent in new life policies of LIC sold through the customer portals, in case payment is made through digital means.
- 8. No transaction fee on digital payments:** Government departments and PSUs will ensure that transactions fee/MDR charges associated with payment through digital means shall not be passed on to the consumers and all such expenses shall be borne by them. State Governments are being advised that the State Governments and its organisations should also consider to absorb the transaction fee/MDR charges related to digital payment to them and consumer should not be asked to bear it.
- 9. Benefits for merchants, traders:** Public sector banks are advised that merchant should not be required to pay more than Rs 100 per month as monthly rental for PoS terminals/Micro ATMs/mobile POS from the merchants to bring small merchant on board the digital payment eco system.
- 10. No cess on cashless payment less than 2000:** No service tax will be charged on digital transaction charges for transactions up to Rs.2000.



DIFFERENT METHODS OF ELECTRONIC PAYMENT SYSTEM

As in the traditional marketplace, so too cyberspace, diversity of payment methods allow customers to choose how they wish to pay. Electronic payment refers to paperless monetary transactions. Electronic payment system has revolutionized the business processing by reducing paper work, transaction costs, labour cost. Being user-friendly and less time consuming than manual processing, these systems help business organization in their market expansion. How you pay for an item depends partly on what payment methods your merchant accepts. Some of the modes of electronic payments are following:

CREDIT CARD

Payment using credit card is one of most common mode of electronic payment. A credit card is a small plastic electronic card made according to ISO 7810 standard specification which is used for settling the payments. It has a magnetic strip embedded in it which is used to read credit card via card readers. Issuer of the credit card lends money to the holder which is used for settling the payment. Credit Card issuer (banks usually) issue the card to user which will be having a pre-negotiated credit limit. When a purchase is done, the consumer signs a slip in which the amount to be paid, along with details of credit card will be mentioned. The consumer sends the details of purchase and the amount owed to credit card issuer is paid in months. The consumer can pay minimum portion of the bill by due date or any amount above the minimum amount. The credit provider charges an interest on the credit amount. If the amount is not paid within due date the interest rate jump up or if it is paid within due date credit issuer may waive the interest. Credit cards are like a knife as if we use it in the right manner, it can help us, but if we misuse it, it can hurt us. Credit cards provide the necessary financial assistance in times of need, but if used unnecessarily and foolishly, the same credit card can become a financial nightmare. Credit cards make it easier to buy products. If we don't like to carry large amounts of cash with us or if a company doesn't accept cash purchases, putting purchases on a credit card make buying products easier. Credit cards save our time and trouble--no searching for an ATM or keeping cash in-hand. Credit card we can use revolving credit to save today (e.g., at a one-day sale), when available cash is a week away. Statements help us to track our expenses. Some cards even provide year-end summaries that really help out for tax calculations. We get more protection if we pay with a credit card rather than if we pay with a debit card, cash or cheque.

Generally, we pay between 2 to 4 percent just to get the cash advance; also cash advances usually carry high interest rates. The high interest rates and annual fees associated with credit cards often outweigh the benefits received. Savings offered by credit cards can often be obtained elsewhere. Low introductory rates may be an attractive option, but they last only for a limited time. When the teaser rate expires, the interest rate charged on our balance can jump dramatically. Sometimes credit cards can be stolen. They may be physically stolen or someone may steal our credit card number (from a receipt, over the phone, or from a Web site) and use our card to rack up debts. Credit cards can make life easier and be a great tool, but if they aren't used wisely they can become a huge financial burden.



DEBIT CARD

Debit card, like credit card is a small plastic card with a unique number mapped with the bank account number. It provides the cardholder electronic access to his or her bank account(s) at a financial institution. Some cards may bear a stored value with which a payment is made, while most relay a message to the cardholder's bank to withdraw funds from a payer's designated bank account. The card, where accepted, can be used instead of cash when making purchases. In some cases, the primary account number is assigned exclusively for use on the Internet and there is no physical card. Unlike credit and charge cards, payments using a debit card are immediately transferred from the cardholder's designated bank account, instead of them paying the money back at a later date. Debit cards usually allow instant withdrawal of cash, acting as the ATM card for withdrawing cash. Merchants may also offer cash back facilities to customers, where a customer can withdraw cash along with their purchase. There are two major types of debit cards. Online debit cards and Offline debit cards. Online debit cards use Personal Identification Number [PIN] to authenticate the system. Offline debit cards are not compatible with PIN system. With online debit cards, the debit is immediately reflected on the account. Offline debit cards usually require 2-3 days to actually show the effect on the user's savings account.

Debit card is safe as no one can access our account without our pin. It allows us to conduct our banking online. It gives us 24 hours access to our money. We don't need to find a bank to withdraw funds. We can use our debit card almost everywhere. It keeps you within budget. When we use a debit card we're limited to spending the amount of money we have in the associated account. No monthly interest charges on our spending. Debit cards are accepted by merchants with less scrutiny than are cheques or credit cards. And swiping a card is much faster than writing out a cheque.

On the flip side, there are the some disadvantages of using a debit card over other payment methods. We must keep an accurate record of our debit card usage to avoid becoming overdrawn on our account. If our account balance is not sufficient to cover the transaction, our card will be denied at the point of purchase and this can be really inconvenient and sometimes embarrassing. Some banks may charge extra fees or penalties for dropping below a minimum required balance that result from using a debit card.

SMART CARDS

Smart cards are receiving renewed attention as a mode of online payment. Consumers can load money into an account on the card by using an automatic teller machine (ATM) or by placing the card in a slot in a specially equipped computer. The embedded chip keeps track of how much money is added to and withdrawn from the account. Smart cards are already quite popular for online sales in some international markets. According to Vince Emery in his book *How to Grow Your Business on the Internet*, they are eventually expected to combine the features of credit, debit, phone, and other cards in one piece of plastic. Visa Cash cards are examples of smart cards. Smart card can be accessed only using a PIN of customer. Smart cards are secure as they stores information in encrypted format and are less expensive/provide faster processing.



ELECTRONIC CASH

Electronic cash (also called e-cash or digital cash) is a general term that describes any value storage and exchange system created by a private (non-government) entity that does not use paper documents or coins and that can serve as a substitute for government-issued physical currency. Electronic cash can be readily exchanged for physical cash on demand.

Digital cash is a form of electronic currency that functions similarly to a debit card. Customers can transfer money from savings and check accounts into an online cash account, from which they withdraw to make purchases over the Internet. This form of payment is particularly well suited to purchase small, low-cost items. In addition, it offers consumers the benefit of anonymity in their purchases, similar to using real cash. The basic technology involved in digital cash transactions is public-key encryption. The use of this approach involves a process. The customer opens an account with a bank and receives special software for his/her PC. The customer buys "electronic money" from the bank by using the software. The customer's bank account is debit accordingly. The bank sends a secured electronic money note to this customer. The money is stored on the buyer's PC and can be spent in any electronic store that accepts e-cash. The software is also used to transfer the e-cash from the buyer's computer to the seller's computer. The seller can deposit the e-cash in a bank, crediting to his/her regular or electronic account, or the seller can use the e-cash to make a purchase elsewhere. Digital signatures are used to authenticate the bank issuing the note and the individual computer user who is spending the money. Some people expect digital cash to become the preferred method of online payment in the near future. Eventually, people using the internet probably will have digital cash on their computer much the same as they have bills and coins in their wallet or purse

For the most part, electronic cash transactions are more efficient (and therefore less costly) than other methods and that efficiency should foster more business, which eventually means lower prices for consumers. Transferring electronic cash on the Internet costs less than processing credit card transactions. Conventional money exchange systems require banks, bank branches, clerks, automated teller machines, and an electronic transaction system to manage, transfer, and dispense cash. Operating this conventional money exchange system is expensive. Electronic cash transfers occur on an existing infrastructure - the Internet - and through existing computer systems. Thus, the additional costs that users of electronic cash must incur are nearly zero. Because the Internet spans the globe, the distance that an electronic transaction must travel does not affect cost. When considering moving physical cash and cheques, distance and cost are proportional – the greater the distance that the currency has to go, the more it costs to move it. Electronic cash does not require that one party obtain an authorization, as is required with credit card transactions.

Electronic cash does have disadvantages and they are also significant. Using electronic cash provides no audit trail. That is, electronic cash is just like real cash in that it cannot be easily traced because true electronic cash is not traceable and another problem arises-money laundering. Money laundering is a technique used by criminals to convert money that they have obtained illegally into cash that they can spend without having it identified as the proceeds of an illegal activity. Money laundering can be accomplished by purchasing goods or services with ill-gotten electronic cash. The goods are then sold for physical cash on the open market. In fact, digital cash accounts could be integrated into consumers' Web browsers, and companies that provide content on their Web sites (like online newspapers and magazines) could charge a nominal fee for surfers to view their



sites. But methods are still needed to be established to standardize the use of digital cash. As it stands, consumers sometimes have to install several different payment software programs to do business with various companies over the Internet.

ELECTRONIC CHEQUES

Small businesses also allow customers to pay for online purchases by accepting personal or business cheques online. Although not as popular as credit cards, electronic cheques are also accepted by hundreds of merchants on the Net. While most electronic cheques schemes require the merchant to use special software, electronic cheques might appeal to us if we do not currently have a credit card merchant account. Online merchants who accept electronic cheques generally set up a form on a Web page and have their customers enter all the information from their regular cheques. The merchant can submit this information to a bank like a regular cheque. A digital signature is used in place of a handwritten one to verify the identity of the customer. One advantage of electronic cheques is that it provides customers with a familiar method of payment. In addition, a number of services are available to simplify the process for both customers and merchants.

INTERNET BANKING/NET BANKING

This is a system that does not involve any sort of physical card. Instead of going to the bank and waiting in an unending queue, internet banking has made all banking functions accessible through a few clicks. It is a very popular electronic payment method to transfer money from one bank account to another bank account. Accounts can be in same bank or different bank. It is used by customers who have accounts enabled with Internet Banking. Fund transfer can be done using ATM (Automated Teller Machine) or using computer. Now days, internet based EFT is getting popularity. In this case, customer uses website provided by the bank. Customer logs in to the bank's website and registers another bank account. He/she then places a request to transfer certain amount to that account. Customer's bank transfers amount to other account if it is in same bank otherwise transfer request is forwarded to ACH (Automated Clearing House) to transfer amount to other account and amount is deducted from customer's account. Once amount is transferred to other account, customer is notified of the fund transfer by the bank.

Banks that offer internet banking are open for business transactions anywhere a client might be as long as there is internet connection. Apart from periods of website maintenance, services are available 24 hours a day and 365 days round the year. In a scenario where internet connection is unavailable, customer services are provided round the clock via telephone. At the touch of a button, actual time account balances and information are availed. This hastens the banking processes hence increasing their efficiency and effectiveness. Another important benefit of the concept of internet banking is that it is good for the environment as it cuts down the usage of paper, reduces pollution as people do not have to travel physically and also does not add emissions. Online banking allows for easier updating and maintaining of direct accounts. The time for changing mailing address is greatly reduced, ordering of additional checks is availed and provision of actual time interest rates. Online banking allows automatic funding of accounts from long established bank accounts via electronic funds transfers. A client can monitor his/her spending via a virtual wallet through certain banks and applications and enable payments.



On the other side, we cannot use it, in case; the bank's server is down. Customary banking allows creation of a personal touch between a bank and its clients. A personal touch with a bank manager for example can enable the manager to change terms in our account since he/she has some discretion in case of any personal circumstantial change. It can include reversal of an undeserved service charge. Direct banks are governed by laws and regulations similar to those of customary banks. Accounts are protected by Federal Deposit Insurance Corporation (FDIC). Complex encryption software is used to protect account information. However, there are no perfect systems. Accounts are prone to hacking attacks, phishing, malware and illegal activities. Banks with complicated sites can be cumbersome to navigate and may require one to read through tutorials to navigate them. Face to face meeting is better in handling complex transactions and problems. Customary banks may call for meetings and seek expert advice to solve issues. We cannot have access to online banking if we don't have an internet connection; thus without the availability of internet access, it may not be useful.

PERSON TO PERSON PAYMENT

Person – to- Person is one of the newest and fastest growing payment schemes. They enable the transfer of funds between two persons for a variety of purposes like repaying money borrowed from someone, sending money to students at college, paying for a product purchases at an online auction, or sending a gift to a family member/relative. One of the first companies to offer this service was PayPal. If you want to send money to someone over the internet, first, you select a service and open up an account with the service. Now, you specify the e-mail address of the person to receive the money, along with the money amount that you want to send. An e-mail is sent to the payee's e-mail address. The e-mail will contain a link back to the service's website. When the recipient will be asked to set up an account to which the money that was sent will be credited. The recipient can then credit the money from this account to either his/her credit card bank account. The payer pays a small amount as charges per transaction.

ELECTRONIC WALLETS

Most of the time when we make a purchase on the web, we are required to fill out a form with our name, shipping address, billing address, credit information, and so on. Doing this a few times is fine, but having to do it every time we shop on the web is an annoyance. One way to avoid the problem of having to repeatedly fill out information is to use an electronic wallet (e-wallet). An e-wallet is a software component that is downloaded to a user's PC and in which the user stores credit card numbers and other personal information and then saving the information stored on their servers for later use. When the user shops at a merchant who accepts the e-wallet, the user can perform one-click shopping, with the e-wallet automatically filling in the necessary information. Credit card companies like VISA and MasterCard offers e-wallet services.

COMPARISON OF ELECTRONIC PAYMENT SYSTEMS

Payments are an indispensable part of our daily transactions, be it a customer to a business, a business to a customer or a business to a business. The electronic payment systems have number of requirements: e.g., Security, acceptability, convenience, cost, anonymity, control, and traceability. Both Debit card and Credit Card Systems are used as an



alternative to cash. Credit cards and debit cards both are electronic cards made according to ISO 7810 standard. In credit card system, money is lent to the user by the card issuer and on other hand in debit card system; money is transferred from the users savings bank account directly. In credit card system, the purchaser need to pay the money into the account before due date and has the facility of revolving the credit. In debit card transactions, the transfer of money is reflected upon the savings account immediately. In credit card transaction signature is put by user as an authentication. In debit card system PIN authentication system is used. Online debit cards are considered superior because the PIN system has more security than signature system, which is used in offline debit cards. Smart cards are similar to credit cards and debit cards, except they store information on an embedded chip instead of on a magnetic strip on the back. Although credit cards dominate online payments today, electronic cash shows promise for the future. Electronic Cash Payment Systems do not need to contact the bank at the time of processing the payments. Electronic Cash Payments are normally used for making low value payments. They are unsuitable for high value payment because they are less secure and preserve anonymity of transactions. Electronic Check Payment System proposed by FSTC also makes use of the Automated Clearing House to process electronic cheques. This is similar to the existing Credit Card architecture. But unlike Credit Card no on-line authorization is required by electronic cheques. Cheques are batched and set to the clearinghouse periodically. Electronic Cheques are used to make payment of low to medium value purchase of products. Credit Card Payment Methods adopts SET protocol as the standard for secure payment transactions. Electronic Check and Electronic Cash payment methods do not have a standard protocol for securing the transactions. Smart Cards require a special chip to be present on the card. Their needs to be hardware card readers, hardware balance readers for the cards, and also on the merchant side hardware smart card processing equipment. Electronic Cheques have the lowest cost. The transaction fees charged to process electronic cheques is lower than that of credit cards.

HINDRANCES IN THE WAY AHEAD:

Shortage of cash has significantly increased the use of digital modes of payment, but the actual shift will only be visible after the cash crunch eases. It is possible that a section of people which has used electronic mode of payment for the first time due to the cash crunch will continue to transact through this medium, but there are still a number of hurdles in making India a cashless economy. Examples of certain people or businesses which are still dependent on cash are as follows:

- Homeless people and others who ask for money on the streets
- Charity workers soliciting cash donations in public areas
- Manual and casual laborers who get paid in cash, either for convenience or for tax reasons
- Cab drivers
- Those who don't have bank accounts or credit cards, including many without regular incomes
- The elderly people
- The very young, also unlikely to have bank accounts
- Anybody who works based on tips, from waiters and waitresses to maids and barhops in hotels to valet parkers



- Small local retailers and restaurants that can't justify high credit card processing fees on mostly small purchases.

The list could go on much longer than that, but the point is that there are those who are in some cases heavily dependent on cash and are relatively powerless to make the changes necessary to keep up. These are often among the poorer and least educated people in our society, and therefore those with least access to technology, the traditional banking infrastructure or information about how to adapt.

SUGGESTIONS FOR THE BEST USE OF DIFFERENT E-PAYMENT SYSTEMS

When choosing an e-payment system, these are few points that should be considered:

- Make sure that we opt the right payment system otherwise we could end up paying more than we need to.
- We should think of our credit card only as a short-term borrowing facility. Our debt can quickly spiral out of control, particularly if we pay off only the minimum monthly amount. We should therefore always try to pay more than the monthly minimum amount.
- Credit card transactions are considered safest while doing online shopping. All the other modes have limitations or are in risk of malpractices. Ensure that your credit card number is not misused in any circumstances.
- Make it as a practice that you are regularly checking the credit card transactions. If any irregularities are found, immediately contact the credit card company and withhold the operation in that number.
- Because electronic cash is issued by private entities, there is a need for common standards among all electronic cash issuers so that one issuer's electronic cash can be accepted by another issue.
- There are several things you can do to prevent credit card fraud: If you lose your card or wallet, report it to your credit card company immediately.
- Don't lend your credit card to anyone and only give out your credit card information to trusted companies or Web sites and check your statement closely at the end of each month to make sure all charges are yours or not.
- Avoid logging in to your bank account at common computers in cyber cafes or libraries. Never allow the browser to remember your ID and password. Do not share your details with anyone.
- Use your login ID and password only on the official login page of the bank, which should be a secure website.
- To keep your data protected, ensure that you disconnect from the internet when you do not require it.



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