Unit-3 Electronic Payment System

Electronic Payment System, Types of Electronic Payment Systems, Smart Cards and Electronic Payment Systems, Infrastructure Issues in EPS, Electronic Fund Transfer.

E-payment system is a way of making transactions or paying for goods and services through an electronic medium without the use of check or cash. It's also called an electronic payment system or online payment system. Read on to learn more.

The electronic payment system has grown increasingly over the last decades due to the widely spread of internet-based banking and shopping. As the world advance more on technology development, a lot of electronic payment systems and payment processing devices have been developed to increase, improve and provide secure e-payment transactions while decreasing the percentage of check and cash transaction.

Electronic payment methods

E-payment methods could be classified into two areas, which are:

1. Cash Payment System

Electronic Funds Transfer (EFT): this is an electronic system used to transfer money from one bank account to another without any cash exchange by hand.

Recommended for You

- Direct debit, that is a financial transaction in which the account holder instructs the bank to collect a specific amount of money from his account electronically for payment of goods or services.
- E-Check, a digital version of an old paper check. It's an electronic transfer of money from a bank account, usually checking account without the use of the paper check.
- Electronic billing: this is another form of electronic funds transfer used by companies or businesses to collect payments from customers over electronic method.

You may also like:

What Is an Issuing Bank?

If you're a credit or debit card owner, you probably heard about an issuing bank. Read on to see what's behind the *issuing bank* term.

Why Card Security Code Matters In Online Shopping?

Ecommerce is growing fast and credit cards are still the most popular online payment method. Read the full post and see what card security code is and why you need one to pay for the goods on the internet.

- Electronic cash (e-Cash): it is a form of an electronic payment system of which certain amount of money is stored on a client device and made accessible for internet transaction. Electronic cash is also referred to as digital cash and it make use of e-cash software installed on the user PC or electronic devices.
- Stored value card: this is another form of EFT used by stores. Stored value card is a card variety that has a certain amount of money value stored and can be used to perform the transaction in the issuer store. A typical example of stored value cards are gift cards.

2. Credit Payment System

- Credit Card: this is another form of the e-payment system which required the use of the card issued by a financial institute to the cardholder for making payments online or through an electronic device without the use of cash.
- E-Wallet: it is a form of prepaid account that stored user's financial data like debit and credit card information to make an online transaction easier.
- Smart card: this use a plastic card embedded with the microprocessor that can be loaded with funds to make transactions and instant payment of bills. It is also known as a chip card.

Benefits of using an e-payment system

eCommerce websites use an e-payment system to make it easier and more convenient to pay for their customers. It comes with many benefits, which are:

- More effective and efficient transactions. It's because these are made just in minutes (even with one-click), without wasting customer's time.
- It also lowers the whole transaction cost.

- Today it's easy to add payments to the website, so even a non-technical person may implement it in minutes and start processing online payments.

- Payment gateways and payment providers offer highly effective security and anti-fraud tools to make transactions reliable.

eCommerce, as well as m-commerce, is getting bigger and bigger, so having e-payment system at your online store is a must. It's simple, fast and convenient for the online shoppers to pay. Still, one of the most popular payment methods are credit and debit card payments, but people also choose some alternatives or local payment methods. If you run an online business, find out what your target audience need, and provide the most convenient and relevant e-payment system.

Types of Electronic Payment Systems

E-commerce sites use electronic payment, where electronic payment refers to paperless monetary transactions. Electronic payment has revolutionized the business processing by reducing the paperwork, transaction costs, and labor cost. Being user friendly and less time-consuming than manual processing, it helps business organization to expand its market reach/expansion. Listed below are some of the modes of electronic payments −

- Credit Card
- Debit Card
- Smart Card
- E-Money
- Electronic Fund Transfer (EFT)

Credit Card

Payment using credit card is one of most common mode of electronic payment. Credit card is small plastic card with a unique number attached with an account. It has also a magnetic strip embedded in it which is used to read credit card via card readers. When a customer purchases a product via credit card, credit card issuer bank pays on behalf of the customer and customer has a certain time period after which he/she can pay the credit card bill. It is usually credit card monthly payment cycle. Following are the actors in the credit card system.

- **The card holder** − Customer
- **The merchant** − seller of product who can accept credit card payments.
- **The card issuer bank** − card holder's bank
- **The acquirer bank** − the merchant's bank
- **The card brand** − for example , visa or Mastercard.

Credit Card Payment Proces

Step	Description
Step 1	Bank issues and activates a credit card to the customer on his/her request.
Step 2	The customer presents the credit card information to the merchant site or to the merchant from whom he/she wants to purchase a product/service.
Step 3	Merchant validates the customer's identity by asking for approval from the card brand company.
Step 4	Card brand company authenticates the credit card and pays the transaction by credit. Merchant keeps the sales slip.
Step 5	Merchant submits the sales slip to acquirer banks and gets the service charges paid to him/her.
Step 6	Acquirer bank requests the card brand company to clear the credit amount and gets the payment.
Step 6	Now the card brand company asks to clear the amount from the issuer bank and the amount gets transferred to the card brand company.

Debit Card

Debit card, like credit card, is a small plastic card with a unique number mapped with the bank account number. It is required to have a bank account before getting a debit card from the bank. The major difference between a debit card and a credit card is that in case of payment through debit card, the amount gets deducted from the card's bank account immediately and there should be sufficient balance in the bank account for the transaction to get completed; whereas in case of a credit card transaction, there is no such compulsion.

Debit cards free the customer to carry cash and cheques. Even merchants accept a debit card readily. Having a restriction on the amount that can be withdrawn in a day using a debit card helps the customer to keep a check on his/her spending.

Smart Card

Smart card is again similar to a credit card or a debit card in appearance, but it has a small microprocessor chip embedded in it. It has the capacity to store a customer’s work-related

and/or personal information. Smart cards are also used to store money and the amount gets deducted after every transaction.

Smart cards can only be accessed using a PIN that every customer is assigned with. Smart cards are secure, as they store information in encrypted format and are less expensive/provides faster processing. Mondex and Visa Cash cards are examples of smart cards.

E-Money

E-Money transactions refer to situation where payment is done over the network and the amount gets transferred from one financial body to another financial body without any involvement of a middleman. E-money transactions are faster, convenient, and saves a lot of time.

Online payments done via credit cards, debit cards, or smart cards are examples of emoney transactions. Another popular example is e-cash. In case of e-cash, both customer and merchant have to sign up with the bank or company issuing e-cash.

Electronic Fund Transfer

It is a very popular electronic payment method to transfer money from one bank account to another bank account. Accounts can be in the same bank or different banks. Fund transfer can be done using ATM (Automated Teller Machine) or using a computer.

Nowadays, internet-based EFT is getting popular. In this case, a customer uses the website provided by the bank, 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 the amount to other account if it is in the same bank, otherwise the transfer request is forwarded to an ACH (Automated Clearing House) to transfer the amount to other account and the amount is deducted from the customer's account. Once the amount is transferred to other account, the customer is notified of the fund transfer by the bank.

Smart Cards and Electronic Payment Systems

A smart card, chip card, or integrated circuit card (ICC) is any pocket-sized card with embedded integrated circuits. Smart cards are made of plastic, generally polyvinyl chloride, but sometimes polyethylene terephthalate based polyesters, acrylonitrile butadiene styrene or polycarbonate.

Smart cards can provide identification, authentication, data storage and application processing. Smart cards may provide strong security authentication for single sign-on (SSO) within large organizations

Types of smart cards:

Contact smart cards

Contact smart cards have a contact area of approximately 1 square centimeter (0.16 sq in), comprising several gold-plated contact pads. These pads provide electrical connectivity when inserted into a reader,[8] which is used as a communications medium between the smart card and a host (e.g., a computer, a point of sale terminal) or a mobile telephone. Cards do not contain batteries; power is supplied by the card reader

Contactless smart cards

A second card type is the contactless smart card, in which the card communicates with and is powered by the reader through RF induction technology. These cards require only proximity to an antenna to communicate. Like smart cards with contacts, contactless cards do not have an internal power source. Instead, they use an inductor 'to capture some of the incident radio-frequency interrogation signal, rectify it, and use it to power the card's electronics

Example of widely used contactless smart cards are London's Oyster card, Hong Kong's Octopus card, Tokyo's Suica and Pasmo cards used for public transportation

Smart Cards and Electronic Commerce:

Smart cards are turning out to be a fundamental piece of the transformation of retailing into electronic commerce. The impressive growth of the Internet is making electronic shopping at least a real possibility, if not a habit, among computer users. However, the business model used in current electronic commerce applications still cannot enjoy the full potential of the electronic medium. Moreover, concerns about the reliability of an invisible counterpart and about the safety of the Internet for credit card information increase the wariness and thereby limit the use of the electronic shopping on the part of customers.

Of the estimated 360 billion payments that took place in the United States in 1995, approximately 300 billion could not have taken place using the existing electronic media. Such transactions involved micro-payments p; i.e. payments for less than $10 p; which are virtually outside of the electronic arena for lack of a payment method compatible with such low amounts. Credit cards or checks are simply too expensive to use for micro-payments, and the e-cash currently being experimented on the World Wide Web does not seem to have the characteristics to appeal to shoppers. For this reason, smart cards could be a fundamental building block of widespread use of electronic commerce, since they are an instrument to pay at a low cost for transactions involving small amounts of money.

Another big advantage of smart cards for electronic commerce is their use for the customization of services. It is already possible to purchase tailored services on the World Wide Web p;

MyYahoo and FireFly are well known examples. However, in order for the service supplier to deliver the customized service, the user has to provide each supplier with her profile p; a boring and time consuming activity. A smart card can contain a non-encrypted profile of the bearer, so that the user can get customized services even without previous contacts with the supplier.

Finally, smart cards are a key technology enabler for financial institutions. The processing power, the portability and the interactive properties of smart cards will constitute the basis for a revolution in the relationship between consumers and banks. PC-based home banking and phone banking will give way to card banking: a phone equipped with a smart card reader will be all that is needed for any kind of transaction.

Credit Cards and Smart Cards have become the most common forms of payment for e-commerce transactions. In North America almost 90% of online B2C transactions were made with this payment type. Now a days, to decrease the risk of fraud, more security steps are being taken by the government and banks to increase the use of plastic money, such as the use of the card

verification number (CVN) which detects fraud by comparing the verification number printed on the signature strip on the back of the card with the information on file with the cardholder's issuing bank.

A Smart card is similar to a credit card a popular smart card initiative is the VISA Smart card. Using the VISA Smart card you can transfer electronic cash to your card from your bank account, and you can then use your card at various retailers and on the internet.

Online payment options:

There are more online payment options than ever before and as an online entrepreneur, you want to offer as many as you can on your site.

A study by CyberSource Corp. found that websites providing four or more payment methods other than credit cards had a sales conversion rate 12 percent higher than those offering just one online payment option in addition to credit cards. In other words, the more online payment options you offer, the

more online payment processing you'll do on your site and the more money you'll make.

Here are the online payment options you could offer on your site:

1) Credit card processing

If you were only going to offer one online payment option to prospective buyers, this would be the one to choose. Credit cards are still the most popular way to pay for goods and services online.

To set up credit card processing on your website, (MasterCard, Visa, American Express, Discover), you need to get anInternet merchant account.

You can get an Internet merchant account through your local banks. Notice I say banks; to get credit card processing of all the major credit cards on your website you may need to get Internet merchant accounts with two separate banks as many banks only deal with some of the credit cards involved.

You can also get an Internet merchant account through a third party merchant account provider, such as Beanstream, Moneris, PSiGate or InternetSecure.

The advantages of getting an Internet merchant account through a third party merchant account provider are that most don't require any security deposits (unlike banks), are quickly set up, and often can be bundled with ecommerce service packages that include the Internet gateway you need for online credit card processing (Web point-of-sale) and a shopping cart. The disadvantage is higher fees. Discount fees in particular tend to be higher than if you had set up your Internet merchant accounts through the banks.

Wherever you get your Internet merchant account, you will have to also purchase an Internet gateway service. The gateway verifies information, transfers requests and authorizes credit cards in real time. All four of the companies I've mentioned above offer these credit card processing services as well, but there are many others that do too – including PayPal.

2) PayPal

PayPal is now also an all-in-one online payment solution. Their Website Payments Standard program lets you accept Visa, MasterCard, Discover, and American Express credit card payments as well as bank transfers and offer PayPal as well – with no monthly fees, setup or cancellation fees. PayPal charges you a fee of 1.9 to 2.9 percent of transaction plus 30 cents per order, depending on your company's sales volume.

PayPal also offers an upgraded version of Website Payments Standard called Website Payments Pro, where customers check out right on your site rather than on PayPal's (currently available only in the U.S.).

They also offer a PayFlow Gateway and PayPal Express Checkout for businesses that already have Internet merchant accounts.

3) Debit Cards

The debit card is the preferred method of payment for one out of two Canadians and there are more than 35 million debit cards in circulation in Canada, according to the Interac Association. In 2006, Canadians made more than three billion Interac Direct Payment transactions worth $148 billion and the number of debit card payments grows about five per cent every year in Canada.

With numbers like that, this is an online payment option you definitely want to offer your customers if you're selling online.

Interac Online is one option that allows your customers to pay for goods and services online directly from their bank accounts. It's convenient and secure for customers because they don't have to share any of their card numbers or financial details when making a purchase; payment is completed through their own financial institutions.

To start offering Interac Online on your website, you have to go through one of their certified acquirers or online payment service providers, such as Beanstream, Moneris, Internet Secure, iCongo or PsiGate. Here's their current list of online payment service providers.

UseMyBank is another Canadian company that provides online debit payment services. Like Interac Online, buyers use their existing Online Banking bill payment service with their own bank to pay for your goods or services online and the payment is directly debited to the selected bank account.

UseMyBank fees "will be assessed upon activation of account" according to their website. A discount rate of 1.5% to 5% and a minimum $1.50 fee per transaction are posted. There is also an account fee. To get started using UseMyBank on your website, apply directly through the UseMyBank website.

4) Give Them Offline Payment Options Too

Some of your potential customers are people who just aren't comfortable with any of the online options outlined above or people who want to talk to a live person. If you want to fully monetize your website and make all the sales that you can, it's important that you give these people ways to pay too. Include a toll-free number and an order form that customers can fill

Infrastructure Issues in EPS

NFRASTRUCTURE ISSUES IN EPS

Infrastructure is necessary for the successful implementation of electronic payments. Proper Infrastructure for electronic payments is a challenge.

1. For electronic payments to be successful, there is the need to have reliable and cost effective infrastructure that can be accessed by majority of the population.
2. Electronic payments communication infrastructure includes computer network. such as the internet and mobile network used for mobile phone.
3. In addition, banking activities and operations need to be automated. A network that links banks and other financial institutions for clearing and payment confirmation is a pre-requisite for electronic payment systems. mobile network and Internet are readily available in the developed world and users usually do not have problems with communication infrastructure.
4. In developing countries, many of the rural areas are unbanked and lack access to critical infrastructure that drives electronic payments.
5. Some of the debit cards technologies like Automated Teller Machines (ATMs) are still seen by many as unreliable for financial transactions as stories told by people suggested that they could lose their money through fraudulent deductions, debits and other lapses for which the technology had been associated with by many over the last few years.
6. Telecommunication and electricity are not available throughout the country, which negatively affect the development of e-payments. The development of information and communication technology is a major challenge for e-payments development. Since ICT is in its infant stages in Nepal, the country faces difficulty promoting e-payment development.

ELECTRONIC FUND TRANSFER

Electronic Funds Transfer (EFT) is the electronic transfer of money from one bank account to another, either within a single financial institution or across

multiple institutions, via computer-based systems, without the direct intervention of bank staff. EFT transactions are known by a number of names. In the United States, they may be referred to as electronic checks or e-checks.

Types

The term covers a number of different payment systems, for example:

- Cardholder-initiated transactions, using a payment card such as a credit or debit card
- Direct deposit payment initiated by the payer

- Direct debit payments for which a business debits the consumer's bank accounts for payment for goods or services
- Wire transfer via an international banking network such as SWIFT
- Electronic bill payment in online banking, which may be delivered by EFT or paper check
- Transactions involving stored value of electronic money, possibly in a private currency.

HOW IT WORKS ?

EFTs include direct-debit transactions, wire transfers, direct deposits, ATM withdrawals and online bill pay services. Transactions are processed through the Automated Clearing House (ACH) network, the secure transfer system of the Federal Reserve that connects all U.S. banks, credit unions and other financial institutions.

For example, when you use your debit card to make a purchase at a store or online, the transaction is processed using an EFT system. The transaction is very similar to an ATM withdrawal, with near-instantaneous payment to the merchant and deduction from your checking account.

Direct deposit is another form of an electronic funds transfer. In this case, funds from your employer's bank account are transferred electronically to your bank account, with no need for paper-based payment systems.

Types of EFT payments

There are many ways to transfer money electronically. Below are descriptions of common EFT payments you might use for your business.

Direct deposit lets you electronically pay employees. After you run payroll, you will tell your direct deposit service provider how much to deposit in each employee's bank account. Then, the direct deposit provider will put that money in employee accounts on payday. Not all employers can make direct deposit mandatory, so make sure you brush up on direct deposit laws.

Wire transfers are a fast way to send money. They are typically used for large, infrequent payments. You might use wire transfers to pay vendors or to make a large down payment on a building or equipment.

ATMs let you bank without going inside a bank and talking to a teller. You can withdraw cash, make deposits, or transfer funds between your accounts.

Debit cards allow you to make EFT transactions. You can use the debit card to move money from your business bank account. Use your debit card to make purchases or pay bills online, in person, or over the phone.

Electronic checks are similar to paper checks, but used electronically. You will enter your bank account number and routing number to make a payment.

Pay-by-phone systems let you pay bills or transfer money between accounts over the phone.

Personal computer banking lets you make banking transactions with your computer or mobile device. You can use your computer or mobile device to move money between accounts.

Electronic Funds Transfer (EFT)

Electronic Funds Transfer (EFT) is a system of transferring money from one bank account directly to another without any paper money changing hands. One of the most widely-used EFT programs is Direct Deposit, in which payroll is deposited straight into an employee's bank account, although EFT refers to any transfer of funds initiated through an electronic terminal, including credit card, ATM, Fedwire and point-of-sale (POS) transactions. It is used for both credit transfers, such as payroll payments, and for debit transfers, such as mortgage payments.

Transactions are processed by the bank through the Automated Clearing House (ACH) network, the secure transfer system that connects all U.S. financial institutions. For payments, funds are transferred electronically from one bank account to the billing company's bank, usually less than a day after the scheduled payment date.

The growing popularity of EFT for online bill payment is paving the way for a paperless universe where checks, stamps, envelopes, and paper bills are obsolete. The benefits of EFT include reduced administrative costs, increased efficiency, simplified bookkeeping, and greater security. However, the number of companies who send and receive bills through the Internet is still relatively small.

The U.S. Government monitors EFT compliance through Regulation E of the Federal Reserve Board, which implements the Electronic Funds Transfer Act (EFTA). Regulation E governs financial transactions with electronic payment services, specifically with regard to disclosure of information, consumer liability, error resolution, record retention, and receipts at electronic terminals.