**E-Payment system**

**WHAT IS Electronic commerce**, - commonly known as **e-commerce** or **eCommerce**, or e-business consists of the buying and selling of [products](http://en.wikipedia.org/wiki/Product_(business)) or [services](http://en.wikipedia.org/wiki/Service_(economics)" \o "Service (economics))over electronic systems such as the Internet and other [computer networks](http://en.wikipedia.org/wiki/Computer_network). The amount of trade conducted electronically has grown extraordinarily with widespread Internet usage. The use of commerce is conducted in this way, spurring and drawing on innovations in [electronic funds transfer](http://en.wikipedia.org/wiki/Electronic_funds_transfer), [supply chain management](http://en.wikipedia.org/wiki/Supply_chain_management), [Internet marketing](http://en.wikipedia.org/wiki/Internet_marketing), [online transaction processing](http://en.wikipedia.org/wiki/Online_transaction_processing), [electronic data interchange](http://en.wikipedia.org/wiki/Electronic_data_interchange) (EDI), [inventory management](http://en.wikipedia.org/wiki/Inventory_management) systems, and automated data collection systems. Modern electronic commerce typically uses the [World Wide Web](http://en.wikipedia.org/wiki/World_Wide_Web) at least at some point in the transaction's lifecycle, although it can encompass a wider range of technologies such as [e-mail](http://en.wikipedia.org/wiki/E-mail) as well.

A large percentage of electronic commerce is conducted entirely electronically for [virtual](http://en.wikipedia.org/wiki/Virtual) items such as access to premium content on a website, but most electronic commerce involves the transportation of physical items in some way. Online retailers are sometimes known as [e-tailers](http://en.wikipedia.org/wiki/E-tailer) and online retail is sometimes known as **e-tail**. Almost all big retailers have electronic commerce presence on the [World Wide Web](http://en.wikipedia.org/wiki/World_Wide_Web).

Electronic commerce that is conducted between businesses is referred to as [business-to-business](http://en.wikipedia.org/wiki/Business-to-business) or B2B. B2B can be open to all interested parties (e.g. [commodity exchange](http://en.wikipedia.org/wiki/Commodity_exchange)) or limited to specific, pre-qualified participants ([private electronic market](http://en.wikipedia.org/wiki/Private_electronic_market)). Electronic commerce that is conducted between businesses and consumers, on the other hand, is referred to as [business-to-consumer](http://en.wikipedia.org/wiki/Business-to-consumer) or [B2C](http://en.wikipedia.org/wiki/B2C). This is the type of electronic commerce conducted by companies such as [Amazon.com](http://en.wikipedia.org/wiki/Amazon.com). [Online shopping](http://en.wikipedia.org/wiki/Online_shopping) is a form of electronic commerce where the buyer is directly online to the seller's computer usually via the internet. There is no intermediary service. The sale and purchase transaction is completed electronically and interactively in real-time such as Amazon.com for new books. If an intermediary is present, then the sale and purchase transaction is called electronic commerce such as [eBay.com](http://en.wikipedia.org/wiki/EBay.com).

Electronic commerce is generally considered to be the sales aspect of [e-business](http://en.wikipedia.org/wiki/E-business). It also consists of the exchange of data to facilitate the financing and payment aspects of the business transactions.

ADAVANTAGES AND DISADVANTAGES OF E COMMERCE

There are many different benefits of E-commerce and E-business. Some of the benefits of E-commerce include purchases can be made 24 hours a day and 7 days a week, making it available to every place in the world, at any time. Other benefits of E-commerce include a larger marketplace, more secure then using cheques, can increase you sales potential, leads to increased productivity. Benefits of E-business include improved speed of response, cost savings, reduced in inventory, better transfer of best practices, and improved customer service. These are all benefits and advantages of E-commerce and E-Business.

Advantages

* With the use of e-commerce you can promote your product globally.
* Reduces Time and money spent
* Gives a competitive advantages
* Removes Location and availability restrictions
* Heightens customer service
* Companies have a bigger increase in their profits if they use Ecommece
* Ecommerce increases sales for companies and decrease costs
* Advertising on the Web can promote small businesses
* Companies can ship their products to different people in the world

Disadvantages

* Security - there are still some people who don't think it is safe to buy on-line.
* You may not recieve what you believe you have purchased.
* Things such as viruses could mean losing the site or affecting your customers computers while on your website.

FUNCTIONS OF E COMMERCE

Electronic commerce is coming of age. Electronic sales in a recent quarter are double those of the entire previous year. In some instances, companies create electronic-commerce capabilities out of a fear of falling behind competitors or as a result of the general momentum to expand the use of an existing Internet presence. But the primary value proposition is the prospect of increased revenue from new markets and creation of new, lower-cost, electronic-distribution channels.Internet service providers (ISPs) are beginning to launch, or are at least evaluating, electronic-commerce hosting services. These services position the service provider as the outsourcer of the customers' electronic-commerce capabilities, managing the networking and server aspects of the initiative. This allows the ISP's customers to concentrate on their core businesses and expands the relationship of the customer and the ISP. An ISP's ability to offer a rich electronic-commerce environment, on its own or in partnership with an electronic-business provider, will be important in differentiating high-value ISPs from lower-value, access-only ISPs.

Customer's Perspective

From a customer's perspective, the purpose of an electronic-commerce system is to enable that customer to locate and purchase a desired good or service over the Internet when the customer is interested in making the purchase. Its function is no more or less than providing a virtual store.

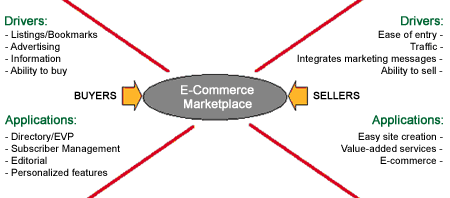
Merchant's Perspective

From a merchant's perspective, the key function of an electronic-commerce system is to generate higher revenues than the merchant would achieve without the system. In order for this to happen, the electronic-commerce system must recreate or utilize existing data and business processes. All of the same processes that the merchant must have in place to support an in-store or catalog purchase must also be in place for an electronic purchase: product information, inventory systems, customer service, and transaction capabilities (including credit authorization, tax computation, financial settlement, and shipping).

Additional functions of an electronic-commerce system, related to revenue generation, are to help redefine and enhance an enterprise's brand strength, customer-service capability, and supply-chain effectiveness. An electronic-commerce system is one of the areas of an enterprise's infrastructure that is open to customers via the Web, but it should be linked with other information technology (IT) systems that affect customer service (i.e., inventory and billing).

Basic Components

Provision of this basic system requires Internet access and an access device at the location of the home shopper, a Web-application server and electronic-commerce software (enabling catalog creation and transaction processing), security gateways to limit external access to internal data systems, and integration software to pull data from the appropriate support systems into the commerce environment



Electronic-Commerce Model

ELECTRONIC PAYMENT SYSTEM - The emergence of e-commerce has created new financial needs that in many cases cannot be effectively fulfilled by the traditional payment systems. Recognizing this, virtually all interested parties are exploring various types of electronic payment system and issues surrounding electronic payment system and digital currency. Broadly electronic payment systems can be classified into four categories: Online Credit Card Payment System, Online Electronic Cash System, Electronic Cheque System and Smart Cards based Electronic Payment System. Each payment system has its advantages and disadvantages for the customers and merchants. These payment systems have numbers of requirements: e.g. security, acceptability, convenience, cost, anonymity, control, and traceability. Therefore, instead of focusing on the technological specifications of various electronic payment systems, the researcher have distinguished electronic payment systems based on what is being transmitted over the network; and analyze the difference of each electronic payment system by evaluating their requirements, characteristics and assess the applicability of each system.

Size of Electronic Payments: Electronic payment system is conducted in different e-commerce categories such as Business-to-Business (B2B), Business-to-Consumer (B2C), Consumer-to-Business (C2B) and Consumer-to-Consumer (C2C).

Conventional vs. Electronic Payment System

To get into the depth of electronic payment process, it is better to understand the processing of conventional or traditional payment system. A conventional process of payment and settlement involves a buyer-to-seller transfer of cash or payment information (i.e., cheque and credit cards). The actual settlement of payment takes place in the financial processing network. A cash payment requires a buyer‟s withdrawals form his/her bank account, a transfer of cash to the seller, and the seller‟s deposit of payment to his/her account. Non-cash payment7 mechanisms are settled by adjusting i.e. crediting and debiting the appropriate accounts between banks based on payment information conveyed via cheque or credit cards.

Seller‟s Deposit Bank Info flows for Payments Goods & notational Services changes Buyer‟s Bank

Process of Electronic Payment System

Electronic payment systems have been in operations since 1960s and have been expanding rapidly as well as growing in complexity. After the development of conventional payment system, EFT (Electronic Fund Transfer) based payment system came into existence. It was first electronic based payment system, which does not depend on a central processing intermediary9. An electronic fund transfer is a financial application of EDI (Electronic Data Interchange), which sends credit card numbers or electronic cheques via secured private networks between banks and major corporations. To use EFT to clear payments and settle accounts, an online payment service will need to add capabilities to process orders, accounts and receipts. But a landmark came in this direction with the development of digital currency. The nature of digital currency or electronic money mirrors that of paper money as a means of payment. As such, digital currency payment systems have the same advantages as paper currency payment, namely anonymity and convenience. As in other electronic payment systems (i.e. EFT based and intermediary based) here too security during the transaction and storage is a concern, although from the different perspective, for digital currency systems double spending, counterfeiting, and storage become critical issues whereas eavesdropping and the issue of liability (when charges are made without authorizations) is important for the notational funds transfer.

I. TYPES OF ELECTRONIC PAYMENT SYSTEMS

With the growing complexities in the e-commerce transactions, different electronic payment systems have appeared in the last few years. At least dozens of electronic payment systems proposed or already in practice are found. The grouping can be made on the basis of what information is being transferred online. There are six types of electronic payment systems: (1) PC-Banking (2) Credit Cards (3) Electronic Cheques (i-cheques) (4) Micro payment (5) Smart Cards and (6) E-Cash.

Online Credit Card Payment System

Electronic Cheque System

Electronic Cash System and

Smart Card based Electronic Payment System

Online Credit Card Payment System: It seeks to extend the functionality of existing credit cards for use as online shopping payment tools. This payment system has been widely accepted by consumers and merchants throughout the world, and by far the most popular methods of payments especially in the retail markets. This form of payment system has several advantages, which were never available through the traditional modes of payment. Some of the most important are: privacy, integrity, compatibility, good transaction efficiency, acceptability, convenience, mobility, low financial risk and anonymity. Added to all these, to avoid the complexity associated with the digital cash or electronic-cheques, consumers and vendors are also looking at credit card payments on the internet as one of possible time-tested alternative. But, this payment system has raised several problems before the consumers and merchants. Online credit card payment seeks to address several limitations of online credit card payments for merchant including lack of authentication, repudiation of charges and credit card frauds. It also seeks to address consumer fears about using credit card such as having to reveal credit information at multiple sites and repeatedly having to communicate sensitive information over the Internet. Basic process of Online Credit Card Payment System is very simple. If consumers want to purchase a product or service, they simply send their credit card details to the service provider involved and the credit card organization will handle this payment like any other. This can be understood very easily with the format (Figure 3) of Credit Card Payment Form.

credit card payment on online networks are divided into three basic categories: (1) payment using clean credit card details (2) payment using encrypted credit card details and (3) payment using third party verification.

Electronic Cheque Payment System: Electronic cheques address the electronic needs of millions of businesses, which today exchange traditional paper cheques with the other vendors, consumers and government. The e-cheque method was deliberately created to work in much the same way as conventional paper cheque. An account holder will issue an electronic document that contains the name of the financial institution, the payer‟s account number, the name of payee and amount of cheque. Most of the information is in uncoded form. Like a paper cheques e-cheques also bear the digital equivalent of signature: a computed number that authenticates the cheque from the owner of the account. Digital chequing payment system seeks to extend the functionality of existing chequing accounts for use as online shopping payment tools. Electronic cheque system has many advantages: (1) they do not require consumers to reveal account information to other individuals when setting an auction (2) they do not require consumers to continually send sensitive financial information over the web (3) they are less expensive than credit cards and (4) they are much faster than paper based traditional cheque. But, this system of payment also has several disadvantages. The disadvantage of electronic cheque system includes their relatively high fixed costs, their limited use only in virtual world and the fact that they can protect the users‟ anonymity. Therefore, it is not very suitable for the retail transactions by consumers, although useful for the government and B2B operations because the latter transactions do not require anonymity, and the amount of transactions is generally large enough to cover fixed processing cost. The process of electronic chequing system can be described using the following steps. Step 1: a purchaser fills a purchase order form, attaches a payment advice (electronic cheque), signs it with his private key (using his signature hardware), attaches his public key certificate, encrypts it using his private key and sends it to the vendor. Step 2: the vendor decrypts the information using his private key, checks the purchaser‟s certificates, signature and cheque, attaches his deposit slip, and endorses the deposit attaching his public key certificates. This is encrypted and sent to his bank. Step 3: the vendor‟s bank checks the signatures and certificates and sends the cheque for clearance. The banks and clearing houses normally have a private secure data network. Step 4: when the cheque is cleared, the amount is credited to the vendor‟s account and a credit advice is sent to him. Step 5: the purchaser gets a consolidated debit advice periodically.

E-cheque provide a security rich Internet payment option for businesses and offer an easy entry into electronic commerce without a significant investment in new technologies or legal systems.

Electronic Cash Payment System: Electronic cash (e-cash) is a new concept in online payment system because it combines computerized convenience with security and privacy that improve on paper cash. Its versatility opens up a host of new markets and applications. E-cash is an electronic or digital form of value storage and value exchange that have limited convertibility into other forms of value and require intermediaries to convert.

E-Cash Structure: e-cash structure could be identified as a string of bits that represents certain values such as reference number and digital signature, which could be used for the security purpose to prevent forgery and criminal use. But, the structure proposed by Wright needs some extension to make e-cash more secure. Therefore, the present model adds a digital watermark to e-cash structure to protect it from the illegal copy and forgery activities further, the model modified the structure of the reference number to support tractability

The following types of electronic payments are most common today. That said, it is important to realize that new payment types are continual being discovered and there are additional methods that exist or are being developed continuously.

**Cards** - Credit cards, debit cards and prepaid cards currently represent the most common form of electronic payments. For all 3 types of cards the consumer or the business most often uses a plastic card, commonly with a magnetic stripe. The cardholder gives his or her card or card number to a merchant who swipes the card through a terminal or enters the data to a PC. The terminal transmits data to his or her bank, the acquirer. The acquirer transmits the data through a card association to the card issuer who makes a decision on the transaction and relays it back to the merchant, who gives goods or services to the cardholder. Funds flow later for settlement with credit cards and are debited immediately for debit or pre-paid cards.

Smart Card - Along with magnetic stripe cards, smart cards are and will increasingly be used for payments. Smart cards are at present overwhelmingly plastic credit cards with an embedded computer chip. Until recently, many smart cards operated using proprietary rather than common standards. Korea and Japan are among the most advanced countries in Asia for smart card payments, with Malaysia catching up fast due to government mandates for banks to issue smart cards.

Over time, the chip for payment can be expected to move onto other devices. A “smart card” might then become the computer chip in a phone, PDA or other device that can perform the same function as chip in a plastic card, eliminating the need for the actual plastic card. Smart cards could thus evolve into “smart phones”, “smart PDAs” or other “smart” devices.

**DOMAIN** - In general, a domain is an area of control or a sphere of knowledge.

1) In computing and telecommunication in general, a domain is a sphere of knowledge identified by a name. Typically, the knowledge is a collection of facts about some program entities or a number of network points or addresses.

2) On the Internet, a domain consists of a set of network addresses. This domain is organized in levels. The top level identifies geographic or purpose commonality (for example, the nation that the domain covers or a category such as "commercial"). The second level identifies a unique place within the top level domain and is, in fact, equivalent to a unique address on the Internet (an [IP address](http://searchWinDevelopment.techtarget.com/sDefinition/0,,sid8_gci212381,00.html)). Lower levels of domain may also be used.

Strictly speaking, in the Internet's domain name system ([DNS](http://searchNetworking.techtarget.com/sDefinition/0,,sid7_gci213908,00.html)), a domain is a name with which name server records are associated that describe subdomains or [host](http://searchCIO-Midmarket.techtarget.com/sDefinition/0,,sid183_gci212254,00.html). For example, "whatis.com" could be a domain with records for "www.whatis.com" and "www1.whatis.com," and so forth.

3) In Windows NT and Windows 2000, a domain is a set of network resources (applications, printers, and so forth) for a group of users. The user need only to log in to the domain to gain access to the resources, which may be located on a number of different servers in the network.

4) A group of [computers](http://www.webopedia.com/TERM/D/computer.html) and [devices](http://www.webopedia.com/TERM/D/device.html) on a [network](http://www.webopedia.com/TERM/D/network.html) that are administered as a unit with common rules and procedures. Within the [Internet](http://www.webopedia.com/TERM/D/Internet.html), domains are defined by the [IP address](http://www.webopedia.com/TERM/D/IP_address.html). All devices sharing a common part of the [IP address](http://www.webopedia.com/TERM/D/domain.html) are said to be in the same domain.

5) In [database](http://www.webopedia.com/TERM/D/database.html) [technology](http://www.webopedia.com/TERM/D/domain.html), domain refers to the description of an [attribute's](http://www.webopedia.com/TERM/D/attribute.html) allowed values. The physical description is a set of values the attribute can have, and the semantic, or logical, description is the meaning of the attribute.

**DNS** - Short for Domain Name System (or Service or Server), an [Internet](http://www.webopedia.com/TERM/D/Internet.html) service that translates [domain names](http://www.webopedia.com/TERM/D/domain_name.html) into IP addresses. Because domain names are alphabetic, they're easier to remember. The Internet however, is really based on [IP addresses](http://www.webopedia.com/TERM/D/IP_address.html). Every time you use a domain name, therefore, a DNS service must translate the name into the corresponding IP address. For example, the domain name www.example.com might translate to 198.105.232.4.

The DNS [system](http://www.webopedia.com/TERM/D/dns.html) is, in fact, its own [network](http://www.webopedia.com/TERM/D/network.html). If one DNS server doesn't know how to translate a particular domain name, it asks another one, and so on, until the correct IP address is returned.

**ISP** - An Internet service provider (ISP), also sometimes referred to as an Internet access provider (IAP), is a company that offers its customers access to the [Internet](http://en.wikipedia.org/wiki/Internet). The ISP connects to its customers using a [data transmission](http://en.wikipedia.org/wiki/Data_transmission) technology appropriate for delivering [Internet Protocol](http://en.wikipedia.org/wiki/Internet_Protocol) [Paradigm](http://en.wikipedia.org/wiki/Paradigm), such as [dial-up](http://en.wikipedia.org/wiki/Dial-up), [DSL](http://en.wikipedia.org/wiki/DSL), [cable modem](http://en.wikipedia.org/wiki/Cable_modem), [wireless](http://en.wikipedia.org/wiki/Wireless) or dedicated high-speed interconnects.

ISPs may provide Internet [e-mail](http://en.wikipedia.org/wiki/E-mail) accounts to users which allow them to communicate with one another by sending and receiving electronic messages through their ISP's [servers](http://en.wikipedia.org/wiki/Server_(computing)). ISPs may provide services such as remotely storing [data files](http://en.wikipedia.org/wiki/Data_file) on behalf of their customers, as well as other services unique to each particular ISP.

## What does ISP mean?

ISP literally means Internet service provider or provider. It is a service (most of the time paid for) which allows you to connect to the Internet.

## Why use an ISP?

Unless you have a specialised line (other than a telephone line), you cannot connect directly to the internet using your telephone line. Indeed, the telephone line was not designed for this:

* it was originally designed to transport "voice", i.e. a frequency modulation in the range of the voice tone
* telephone servers only know how to start a conversation from a telephone number
* unless you resort to a special service, generally it is not possible to have communication between more than two points...

So, the internet service provider is an intermediary (connected to the internet by specialised lines) which gives you access to the Internet, using a number which you enter using your [modem](http://en.kioskea.net/contents/technologies/modem.php3), and which enables a connection to be established.

## How does the ISP connect you to the Internet?

When you are connected to the Internet through your service provider, communication between you and the ISP is established using a simple [protocol](http://en.kioskea.net/contents/internet/protocol.php3): PPP (Point to Point Protocol), a protocol making it possible for two remote computers to communicate without having an IP address.   
In fact your computer does not have an [IP address](http://en.kioskea.net/contents/internet/ip.php3). However an IP address is necessary to be able to go onto the Internet because the protocol used on the Internet is the TCP/IP protocol which makes it possible for a very large number of computers which are located by these addresses to communicate.

So, communication between you and the service provider is established according to the PPP protocol which is characterised by:

* a telephone call
* initialisation of communication
* verification of the user name (login or userid)
* verification of the password

Once you are "connected", the internet service provider lends you an IP address which you keep for the whole duration that you are connected to the internet. However, this address is not fixed because at the time of the next connection the service provider gives you one of its free addresses (therefore different because depending on its capacity, it may have several hundreds of thousand addresses.).   
Your connection is therefore a proxy connection because it is your service provider who sends all the requests you make and the service provider who receives all the pages that you request and who returns them to you.

It is for these reasons for example that when you have Internet access via an ISP, you must pick up your email on each connection because generally it is the service provider that receives your email (it is stored on one of its servers).

## Differences between ISPs

Selecting an ISP depends on many criteria including the number of services offered and the quality of these services. So what are these criteria?

* Cover: some ISPs only offer cover in large towns, other offers national coverage, i.e. a number which is charged as a local call wherever you are calling from
* Bandwidth: this is the total speed that the ISP offers. This bandwidth is shared between the number of subscribers, so the more the number of subscribers increases the smaller this becomes (the bandwidth allocated to each subscriber must be greater than his transmission capacity in order to provide him with a quality service).
* Price: this depends on the ISP and the type of package chosen. Some ISPs now offer free access
* Access: unlimited: some ISPs offer a package where your connection time is taken into account, i.e. you cannot exceed a number of hours of connection per month, in which case the call charge is subject to a price increase (additional minutes are very expensive). Some providers even offer tariffs without subscription, i.e. only the communication is paid for (but obviously is more expensive than a local call)