

Framework of e-Commerce

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Abstract

This paper provides a detailed explanation of e-commerce and how it works. It explains what e-commerce is from a business perspective, a communications perspective, a service perspective, and an online perspective. The paper also looks at the different classifications and categories of e-commerce. It identifies some application areas of e-commerce. This also describes the various forms of encryption technology to secure the messages over the internet. It also addresses some of the fundamental flaws in the way e-commerce is being conducted at present and offers solutions that would eliminate such glitches from future online e-commerce transactions. It also explains the various modes of payment used in electronic transactions. This paper explains that the e-commerce site may be designed and managed by any provider, but the payments have to be organized through third party payment providers such as PayPal which is a largest peer-to-peer payment service.

Keywords and Phrases: e-commerce, communication, transactions, encryption, PayPal

Introduction

The exchange or buying and selling of commodities on a large scale involving transportation from place to place is known as commerce. When all this is done electronically, it is known as “e-commerce”. E-commerce from communication perspective is the delivery of information, products or services, or payments via telephone lines, computer networks, or any other means-commerce from business perspective, is the application of technology toward the automation of business transaction and workflows. E-commerce from service perspective is a tool that addresses the desire of firms, consumers and management to cut service costs while improving the quality of goods and increasing the speed of service delivery. E-commerce from online perspective provides the capability of buying and selling products and information on the Internet and other online services.

Features of e-Commerce

- e-Commerce is doing business online and electronically.

- e-Commerce is about buying and selling products and services on the Internet.
- The sellers are individuals, small businesses or large corporations.
- The buyers are consumers or businesses.
- Payment can be made by credit or debit card, money order, cash, check, services or trade.
- e-Commerce helps in lowering both order taking cost and customer service costs.
- The ranges of things that can be sold using e-commerce is enormous and include art, apartment, antennas, batteries, bicycles, books, cars, cells phones, computer, cosmetics and whatever else can change hands.

Types of e-Commerce Systems

e-Commerce can be categorized in the following ways:-

- I. **B2C (Business to Consumer)** – This is most common form of e-commerce. These systems allow businesses to sell goods and services to consumers via the internet. Group of these online shop-fronts are called e-malls and are essentially online shopping centers.

II. **B2B (Business to Business)** – These systems are designed for businesses to collaborate or sell goods and services to each other.

III. **B2B2C (Business to Business to Consumer)** – These systems are merely combinations of B2B and B2C systems designed to manage the whole supply chain from the consumer through to raw material providers. They are design to process orders from consumers and then use this information to place orders with wholesalers and ultimately manufacturers.

IV. **G2B or G2C (Government to Business or Government to Consumer)** – These systems involve the government providing services to business and consumers. These services may range from the online provision of information through to electronic lodgment of forms or tax returns.

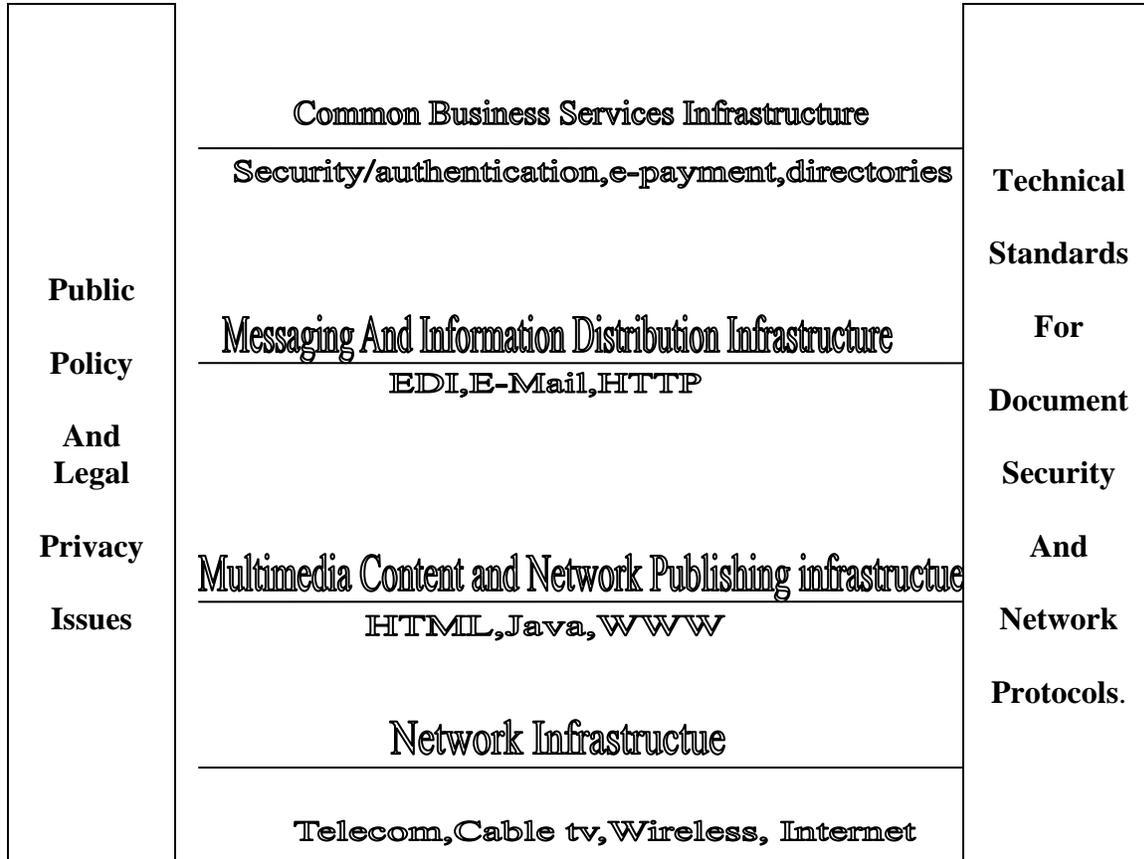
Framework of e-commerce can be viewed as shown below:-

e-Commerce Applications

- **Supply Chain Management**
- **Video on demand**
- **Remote banking**
- **Online Marketing and purchasing**
- **Home shopping**

Framework of e-commerce

Framework tells about the detail of how e-commerce can take place. It defines actually how e-commerce implemented, how online trading or business can be done. It defines important components that should be present to do some transaction.



The important components of this framework are:

1. **Network Infrastructure**

- Network Infrastructure is called as “INFORMATION SUPERHIGHWAY” is the path through which actual information flows and moves between sender and receiver.
- Information Superhighway consists of telecommunication companies that provide telephone lines.

- Cable TV systems that provide coaxial cables and direct broadcast satellite networks.
- Wireless companies that provide mobile radio and satellite networks.
- Computer networks include private networks and public data networks like the Internet.

All these modes of communication are interconnected. They are connected with routers, switches, bridges, gateways etc which are devices to connect similar and

different network. All the information flow on these lines and through these devices and reach the desired destinations.

2. **Multimedia Contents And Network Publishing**

The Information Superhighway is the transportation foundation that enables the transmission of content. The most prevalent architecture that enables networking publishing is the World Wide Web. The web allows small businesses and individuals to develop content in the form of Hypertext Markup Language (HTML) and publish it on a web server. Web provides a means to create product information (content) and a means to publish it in a distribution center.

(network server).

3. **Messaging And Information Distribution Infrastructure**

The information content transferred over the network consists of text, numbers, pictures, audio and video. But the network does not differentiate among content as everything is digital, that is, combinations of zero's and one's. Once contents has been created and

stored on a server, messaging and information distribution methods carry that content across the network. Messaging vehicle is called middleware software. Messaging and information distribution include translators that interpret and transforms data formats.

4. **Common Business Services Infrastructure**

This infrastructure includes the different methods for facilitating online buying and selling processes. In online commerce, the buyers sends an electronic payment as well as some remittance information to the seller. Settlement occurs when the payment and remittance information are authenticated by the seller and accepted as valid. In order to enable online payment for information and ensure its safe delivery, the payment services infrastructure needs to develop encryption (making contents indecipherable except for the intended recipient) and authentication (making sure that customers are who they say they are) methods that ensure security of contents traveling on the network.

5. **Public Policy And Technical Standards**

Public Policy And Technical Standards are two support pillars for all e-commerce applications and infrastructure. Public policy related to e-commerce encompasses such issues as universal access, privacy and information pricing.

Technical Standards dictate the specifics of information publishing tools, user interfaces and transport. Standards are essential to ensure compatibility across the entire network of world.

These are the main components of framework of e-commerce. By following all these trade can be done efficiently on the network. There are many applications of e-commerce which work on this framework.

Applications of e-Commerce

The various applications of e-commerce are:-

- Online Shopping
- Home Banking
- Supply Chain Management
- Video On Demand
- Online Marketing and Advertising and many more.

Online Shopping and Advertising

With the use of e-commerce, one can do online shopping. Unlike traditional model, customer need not to go to store, he or she can visit any website and find all the information regarding any product at screen of his computer and places the order.

In the online model, the retailer seeks out the customer. With online shopping, constraints of time and space disappear. There is no bricks and mortar storefront to worry about, no critical locations. Retailer can only concentrate on the quality of their product. They need not to worry about the stores where customer came and saw their product. They advertise their product on the Internet in such a way that more and more people get attracted to it. Mostly, retailer put the information of their product on such a web site which is heavily visited by user like Yahoo.com, Indiatimes.com etc. When their product advertisement is seen by many people, more customers will get attracted and thus merchant can get more orders.

On the customer side, it is also easy for a customer to do online shopping, He need not to go to market place by crossing

the heavy traffic areas and then find out the parking place for their vehicles, find and select items for purchase, take them to checkout counter, wait in line, pay for items and carry them back to home.

With online shopping, customer sit in front of his computer screen and then find out the information regarding his product by visiting different websites. Choose the product by considering all the aspect which includes its cost, quality etc. and then places an order. And after some time he got the home delivery of his product.

Customer can pay the bill by the mode which he and his merchant have decided. He can pay the bill online with the help of credit cards, debit cards; electronic checks, digicash etc or he can pay the bill to person who delivers the product at his home.

Thus online shopping saves time and money of customer as well as merchant.

Home or Online Banking

Home Banking means one can operate his or her account while sitting at their home. That is customer can manage their account from somewhere else. They need not to go to bank to manage their

account. Customers can deal with the bank from anywhere in online banking.

Customer has to just open the bank website and has to make a request that he is owner of so and so account. He want to credit this much of amount or he want to debit this much of amount from his account. That is customer made a request to bank to manage his account. For doing this customer have to prove his identity by giving his password etc. and when the validity of a person is proved, he is permitted to access account.

When the matter is of money, more risk is involved in its transactions as more and more hackers will try to hack the information and will try to make unwanted changes to customer's accounts. So there is a great need of tight security in online banking or wherever the financial transactions come.

To make online banking successful or to prevent the important from going into wrong hands, all the data in the transactions are send in encrypted form. Encrypted form is that where the original text is coded into secret code and that code can only be open by a person who has the key to decrypt the data.

This is safe method to do online banking because if the information is hacked by a

hacker, he will not be able to get the actual message as it is in encrypted form and he would not be able to decode the message because the decryption key is not known to him.

Home Banking is also important because one can pay the bill online through his account. He needs not to carry cash along with him which always have the fear of theft. He can pay his dues directly from his bank account. Payments are made with the help of credit cards, debit cards, electronic checks, digital cash etc.

Thus online banking makes the life of people easier. They need not to carry cash with him. They can go anywhere in the world and can manage their account. This is just like they are taking their bank along with them.

Supply Chain Management

Supply Chain Management is a term that encompasses the coordination of various department of a company. It includes order generation, order taking, order fulfillment and distribution of products or services or information.

A supply chain is a collection of inter-dependent steps that, when followed,

accomplish a certain objective such as meeting customer requirements.

The key players of business are –

1. Production Department
2. Marketing Department
3. Customer Service Department
4. Accounting and Finance Department
5. Shipping and Distribution Department

All these are key functions of a business. Concentrating on one or two of them will not increase profit or increase productivity. It will not fulfill the purpose of company development, if consideration is not given to all departments.

So working of all the department should be concentrated to give rise to the company. One important feature that is required to fulfill for the company development is the integrity of these entire department. If these key functionaries do not interact with each other, customers expectation of prompt delivery of product to precise locations, physical quality etc could not be fulfilled. So there must be coordination between all these departments. There should be flow of information between and within organizations. Each and every department should have the information of other

department. Every one must know the status of another department so that they can take their decisions in time which would be for the betterment of a company. This information can be provided online to each and every department. So the major role of Supply Chain Management is to transfer information to each and every department with very less time. And this can be done effectively with the use of INFORMATION SUPERHIGHWAY present in the framework of e-commerce.

Security In e-commerce

Security of transaction in online business is done by *encryption* and *decryption* of data. The goal of encryption is to make it impossible for a hacker who obtains the cipher text that is encrypted information as it passes on the network to recover the original message. Encryption is the mutation of information in any form (text, video, and graphics) into a form readable only with a decryption key. A “key” is a very large number, a string of Zeros and Ones.

There are two methods of doing Encryption:-

1. Secret Key Algorithm
2. Public Key Algorithm

Secret Key Algorithm

It is also known as Symmetric Encryption. In this same set of keys are used by both sender and receiver. The sender and receiver decide the key before transmission of data. This key is kept secret. It is known only to the sender and receiver not anyone else. The sender encode the data with secret key and send it, when it is received by the receiver, the receiver decode the data using same set of key. This technique is working in DES algorithm.

Public Key Algorithm

It is known as Asymmetric Encryption algorithm. In this every user in online trading is given two sets of keys. One is called **Private Key** and other is called **Public Key**. Public Key of each user is known to everyone on the internet. Private key is known to its owner only.

Now suppose A want to send data to B using Public Key Algorithm. The public keys of both A and B is known to everyone. A send its data by encoding it with B public key. When it reaches to its destination, that data will be decoded by B using its private key.

Suppose if data is hacked by hacker on the way, he would not be able to decode that

data because that data would be unlock by B private key which hacker don't have.

In this way with the help of Public Key Algorithm security can be provided to data.

Electronic Payment Systems

Electronic Payment is a financial exchange that takes place online between buyers and sellers. Then content of this exchange is usually some form of digital financial instrument such as encrypted credit card numbers, electronic checks or digital cash that is backed by a bank or an intermediary or by legal tender. The desire to reduce costs is one of the major reasons for the increase in electronic payments.

Some of the various modes of e-payment systems are –

1. Electronic or Digital Cash
2. Electronic Checks
3. Credit Cards Or Debit Cards

Digital Cash

Digital cash is based on cryptographic systems called “**Digital Signatures**”. Digital Signatures are used to provide assurance that the statements written in the document are agreed upon by the under signed. Digital Signatures

involves a pair of numeric keys one is used for locking and other is used for unlocking. Locking means doing encryption and unlocking means doing decryption.

The encryption is kept private and the decryption is made public. When any document is send by the sender to someone it encode that document with its private key and when the receiver receive that document and decode it using sender public key, it provide assurance to the receiver that the document belongs to the sender only because it is open by its public key only.

Digital cash works on Digital Signature principal. In digital cash , transactions are to be made between customers and bank. So by supplying all customers with its public key, a bank enables customers to decode any message or currency encoded with bank private key. If decryption by a customer yields a recognizable message, the customer can be confident that the bank had encoded it.

Before digital can be used to buy products or services, it must be procured from a currency server. The purchase of digital cash from an online currency server or bank involves two steps –

1. The establishment of an account

2. The maintenance of sufficiently money in the account to back any purchases.

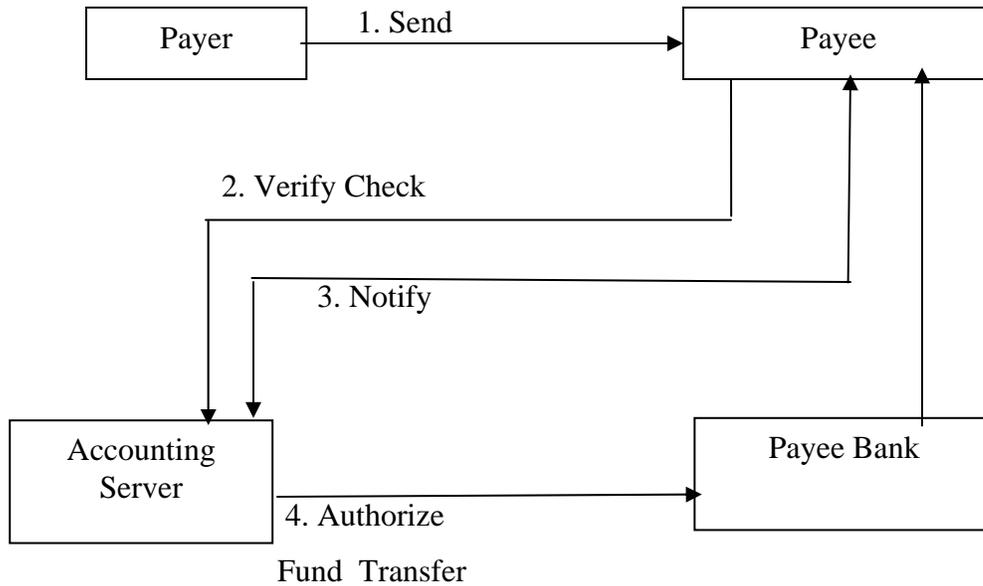
Once the account has been established, consumers use the digital cash software on the computer to generate a random number, which serves as a “note”. In exchange of money debited from the customer’s account, the bank uses its private key to digitally sign the note for the amount requested, and transmits the “note” back to the customer. The network currency server is issuing a “bank note” with a serial number and a dollar amount. Through its digital signature, the bank commits itself to back that note generation with its face value in real dollars. This method of note generation is very secure, as neither the customer nor the merchant can counterfeit the bank’s digital signature.

Electronic check

Electronic payments can be made with the help of e-check also. E-check works in the same way as traditional checks. E-checks are modeled on paper checks, except that they are initiated electronically, use digital signatures for signing and endorsing and require the use of digital certificates to authenticate the

payer, the payer’s bank and bank account. E-check payments are gathered by banks and cleared through existing banking channels, such as Automated Clearing Houses (ACH). e-check user must register with a third party account server before they are able to write e-checks. An account holder will issue an electronic document that contains the name of the payer, the name of the payer’s financial institution, the payer’s account number, the name of the payee and the amount of check. It will also contain digital signature of payer. Then an e-check is endorsed by the payee, using its digital signature. Properly signed and endorsed checks can be electronically exchanged between financial institutions through electronic clearing houses.

E-check encashment process can be viewed as –



When the payee receives an e-check, the payee presents it to the accounting server for verification and payment. The accounting server verifies the digital signature on the check. When all is found correct the accounting server create an order to a bank computer that authorizes the funds transfer to the payee’s bank. That is instruction are send to the payee’s bank to debit money from the payer’s account.

Credit Card Payment Systems

In this system, all the information including credit card details are in encrypted form which is initiated when credit card information is entered into a browser or other electronic commerce device and securely over the network from buyer to seller as an encrypted message. The steps which actually followed are –

1. A customer presents his/her credit card information securely to the merchant.
2. The merchant validates the customer’s identity as the owner of the credit card account.
3. The merchant relays the credit card information and digital signature to his or her bank or online credit card processor.

4. The bank or processing party relays the information to the customer's bank for authorization approval.
5. The customer's bank return the credit card data , charge authentication and authorization to the merchant.

Debit Card Payment Systems

Debit card is much like the credit cards. In this the merchant swipes the card through a transaction terminal, which reads the information. The customer enter his personal identification number (PIN) and the terminal routes the transactions through the ATM network back to the customer's bank for authorization against the customer's demand deposit account. The funds once approved are transferred from the customer's bank to the merchant's bank.

Conclusion

"e-Commerce is a worldwide opportunity which will be the major means of building business in the 21st century." In Nutshell, we can conclude that e-commerce strategies can help just about any type of company usher in new business that it never could have obtained without the existence of the Internet. We have studied the structure, nature of e-commerce, some of its benefits and some of its limitations, as well as how it has developed and what may be its future applications.

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