Republic of Iraq

Ministry of Higher Education & Scientific Research
Supervision and Scientific Evaluation Directorate Quality Assurance and Academic Accreditation

Academic Program Specification Form For The Academic

University: University of Anbar

College : Department : College of computer science and Information Technology / Information Technology
Date Of Form Completion :

Dean 's Name Date : /

/

Signature

Dean 's Assistant For Scientific Affairs
Date : / /
Signature

Head of

Department

Date : /
/

Signature

Quality Assurance And University Performance Manager
Date : / /
Signature

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	College of CS & IT – University of Anbar
2. University Department/Centre	Information Systems
3. Course title/code	E- Commerce
4. Programme(s) to which it contributes	
5. Modes of Attendance offered	
6. Semester/Year	2nd / 2023
7. Number of hours tuition (total)	30
8. Date of production/revision of this specification	25/10/2023
9. Aims of the Course	
▪ To make students familiar with the basic concepts of E-Commerce	
▪ To explain the basic applications of E-Commerce Technology	
▪ To explore the principles and practice of e-Commerce models.	
▪ To highlight the technical and social issues related to E-Marketing Plan	

10· Learning Outcomes, Teaching ,Learning and Assessment Methods

A1. Describe the basic concepts of E-Commerce.

A2. Have good understanding of available strategies and technologies for E-Commerce.

A3. Describe the social and ethical issues relating to E-Marketing Plan

A4. Describe the social and ethical issues relating to E-payment system.

A5.

B. Subject-specific skills

B1. Applying and use of the E-Commerce applications.

B2. Demonstrate skills in using E-Commerce Models for various applications.

B3. Demonstrate skills in applying CMS

Teaching and Learning Methods

- Assignments of various chapters should be performed individually by students.
- Home works will be distributed during the course. Unless otherwise is stated, all home works should be performed individually by students.
- Quizzes and exams.
- Referring to some related websites.

Assessment methods

- Classroom participation.
- Projects activity.
- Exam performance.

C. Thinking Skills

C1. Marinating the scientific honesty.

C2. Achieving academic rigorousness.

C3. Personal integrity and work ethics.

C4.

Teaching and Learning Methods

- Programming projects will be assigned to students. Usually these can be done based on student groups to be formed during the course.
- Relating the course material to practical society needs.
- Offering bonus to student achievements.

Assessment methods
▪ Doing the required tasks within the specified deadlines. ▪ Following the course discipline and academic integrity. ▪ Evaluating the student response in various exams.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Development of the skills of using the Internet and intranets efficiently.

D2. Development of the skills of using multimedia and cellular technology securely.

D3. Development of the skills of academic debate and critical thinking.

D4.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1st	2	Familiarity with basic concepts	Introduction of Electronic Commerce	Theoretical	Assignment and discussion
2nd	2	Dealing with modern tech.	E-Commerce Models	Theoretical	Quiz
3rd	2	Dealing with modern tech.	E-Payment Systems	Theoretical	Group work
4th	2	Dealing with modern tech.	Content Management System	Theoretical	Assignment and discussion
5th	2	Dealing with modern tech.	E-Commerce Technology Part1	Theoretical	Assignment and discussion
6th	2	Dealing with modern tech.E-commerce	E-Commerce Technology Part2	Theoretical	Assignment and discussion

		economics			
7th	2	Dealing with modern tech.	E-Commerce Consumer Applications	Theoretical	Group work
8th	2	Dealing with modern tech.	Network and Electronic Transactions Today	Theoretical	Quiz
9th	2	Dealing with modern tech.	Internet Environment for E-Commerce	Theoretical	Group work
10th	2	Dealing with modern tech.	Electronic Data Interchange to E-Commerce	Theoretical	Assignment and discussion
11th	2	Dealing with modern tech.	Security Framework	Theoretical	Quiz
12th	2	The strategic process	Cyber Security and Crime	Theoretical	Assignment and discussion
13th	2	The strategic process	Management of Change	Theoretical	Assignment and discussion
14th	2	Key issues	Designing and Building E-Commerce Web Site - Basics	Theoretical	Quiz
15th	2	Dealing with modern tech.	Designing and Building E-Commerce Web Site - Advanced	Theoretical	Group work

12. Infrastructure	
Required reading: ▪ CORE TEXTS ▪ COURSE MATERIALS ▪ OTHER	▪ E-Commerce and E-Business DCAP511/DCAP306 Editor Dr. Manmohan Sharma for Lovely Professional University Phagwara ▪ Colin Combe, Introduction to E-business Management and strategy: Butterworth-Heinemann is an imprint of Elsevier Linacre House, Jordan Hill, Oxford OX2 8DP 30

	Corporate Drive, Suite 400, Burlington, MA 01803,First edition 2006. ▪ Dave Chaffey, E-Business& E-Commerce Management: Strategy, Implementation and Practice 5th Edition.
Special requirements (include for example workshops, periodicals, IT software, websites)	● https://www.thebalancesmb.com/best-e-commerce-books-1141449 ● https://www.temok.com/blog/what-is-e-business/ ● https://searchcio.techtarget.com/definition/e-business ● https://tfig.unece.org/contents/e-business-solutions.htm
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	None
Minimum number of students	10
Maximum number of students	50

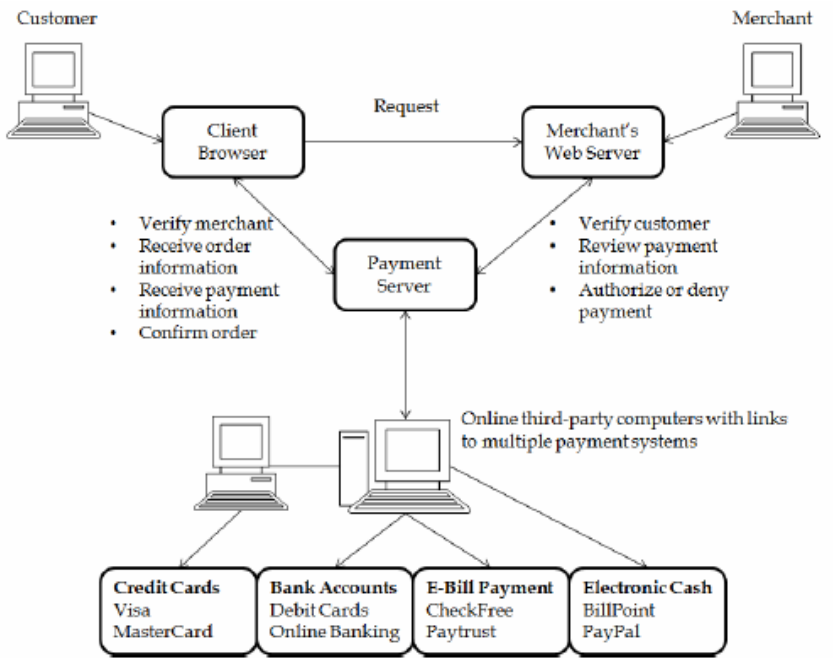
8.1Basics of E-Commerce: Network and Electronic Transactions Today

Electronic transaction such as payment for the goods and services purchased online is an important step in the e-commerce transaction process. The main business concerns of electronic payments and security include:

1. The unknown networked computer systems used in electronic transactions are sometimes unreliable.

2. The wide range of debit and credit options, financial institutions and intermediaries make electronic transactions a difficult process. Figure.1 shows the network of electronic transaction process taking place between buyers and sellers.

Figure 1 : Electronic Transaction Process



B2C e-commerce systems on the Web depend on credit card transaction processes. But many B2B ecommerce systems depend on more complex transaction processes based on the use of purchase orders.

B2C and B2B e-commerce systems generally use an electronic shopping cart process. This process allows consumers to select various products from a Web site catalog and place them temporarily in a virtual shopping basket. These selected products can later be checked out and processed for payment.

8.2 Electronic Funds Transfer

Electronic Funds Transfer (EFT) is the main method of e-commerce transaction systems in banking and retailing industries. Various information technologies are used in EFT systems to process money and credit transfers between banks and businesses and their customers.

Secure Electronic Payments

Network sniffers, software that easily recognize credit card number formats, may capture your credit card information when you make a purchase online. Various basic security measures are being implemented to solve this problem. They include:

1. Encryption of data passing between the customer and merchant.

2. Encryption of data passing between the customer and the company to authorize the credit card transaction.

3. Taking sensitive information offline The security methods developed for secure electronic transactions include:

1. ***Secure Socket Layer (SSL):*** It helps to automatically encrypt the data passing between your Web browser and a merchant's server.

2. ***Digital Wallet:*** It is the security software for your Web browser. Digital wallet helps your browser to encrypt credit card data so that only the bank that authorizes credit card transactions for the merchant can see it.

3. ***Secure Electronic Transaction (SET):*** It helps to encrypt a digital envelope of certificates specifying the payment details for each transaction. SET is expected to become the dominant standard for secure electronic transactions over the Internet.

11. Security Framework

11.1 Introduction

In software industry, security is defined in two different perspectives, one from the viewpoint of software developers and the other from the customers. The main concern for software developers is to ensure that the system comprises certain security features to safeguard it. For example, many software products ensure the password to be at least six characters long and have a capability of encrypting sensitive data. For customers using software product, the main concern would be to obtain protection against virus attacks.

Example: If your system is not safeguarded by antivirus software, then it is prone to get affected by virus when you download games or other files from the Internet.

Here, your system is an example of insecure system. A secured system functions without displaying unintentional bugs. Let us now focus on the likely attacks that can take place in an e-commerce system. We shall also consider the preventive strategies to be implemented.

11.2 Security Concerns

In e-commerce, all the transactions are carried out over the Internet. Though the process seems to be interactive and convenient, there are certain risks inherent to the process such

as, duplication of bills are difficult to detect and the transaction information can be altered without leaving any hint. Whereas, when the transactions take place using paper, the purchase documents cannot be modified as there would be some evidence such as signatures and trademarks that are left behind to trace it down.

An efficient e-commerce system should bring in reliability in identifying and tracing any modifications done to transaction documents such as bank cheque, purchase order, and replacement bills. Whether the transactions are carried out using paper documents or electronic media, they should ensure that the information is not destroyed, and any other third party user or hackers do not use it inappropriately. An efficient e-commerce system should guarantee:

1. ***Confidentiality:*** The transaction information should be protected from unauthorized access by internal users and hackers, as it is vulnerable to be intercepted during transmission over several networks. The information should be encrypted to make it difficult for attackers to trace the algorithm.

2. ***Integrity:*** The transaction document when retrieved from any communication network must be reliable and should resemble the transmitted document without any addition, deletion, or modification.

3. ***Availability:*** The transaction information communicated across several networks should be available when required. There are several reasons for the unavailability of transaction information such as, virus attacks, abrupt shutdown of systems due to electricity failure, network errors, and errors in product software and hardware.

4. ***Authenticity:*** The retrieved transaction information needs verification to check whether it was sent by the sender or by any other source claiming to be the sender. Likewise, it is also essential to check if the information was delivered to the intended recipient.

5. ***Non-reputability:*** The sender and the recipient should not deny about the transactions made earlier. The communicated transaction information and its acknowledgement must synchronize with the sender and receiver.

6. ***Auditability:*** The information about the transactions made must be constantly reviewed to check if they comply with the information confidentiality and integrity requirements.

11.2.1 Types of Security Vulnerabilities in E-Commerce Systems

Today, almost all transactions are carried out online. This has resulted in a sharp increase of virus attacks and information hacking in online payment systems. The hackers utilize vulnerabilities published in reusable third party components

such as, shopping cart software commonly used by online shopping Web sites. Other hackers make use of possible vulnerabilities that commonly occur in Web applications like Structured Query Language (SQL) injection or cross-site scripting.

Following are some of the security vulnerabilities that occur in e-commerce systems:

1. ***SQL Injection:*** This is a type of security vulnerability wherein the attackers insert certain SQL Meta characters in the user input. Generally, attackers check if a site's security features are weak enough to get affected. They perform this check by sending a single quote character (') embedded in the user input. When the site responds, the attacker's queries execute in the back-end database.Then, the attackers modify the query to a Boolean value that is always true and thus, gain access to the restricted areas of the site.

Example: E-Commerce Web sites such as Guess.com and PetCo.com were found more vulnerable to SQL injection attack. A 20-year old programmer in Orange County, California, found that it is possible to access highly sensitive data such as, credit card numbers and transaction details from these Web sites using specially created URLs consisting of SQL Meta characters.

The Web sites are attacked using SQL injection technique depending on the type of back-end database being used for the site. SQL injection technique on an Oracle database can be

attacked using the UNION keyword. Attacking an application that uses Oracle as back-end is very difficult when compared to attacking an application that uses MS SQL Server as back-end. In MS SQL server, the queries are terminated with a semicolon and hence, it makes easy for the attackers to insert a Meta character in the query.

2. ***Price Manipulation:*** This type of security vulnerability is common in online shopping Web sites and payment gateways. When a consumer purchases a commodity online, the price is stored dynamically in a HTML hidden field. An attacker can modify the payable amount by using a Web application proxy when information flows from the user's browser to the Web server. When the number of transactions is more, the modification made to the price often goes unnoticed. Frequent attacks of this type will reduce the credibility of online merchant.

3. ***Buffer Overflow:*** This type of security vulnerability involves overloading a Web application by sending data in larger volumes than its actual capacity. When this happens, the back-end of the application may not be able to process the large data and hence, would display a fatal error message showing the location of the functions. This would allow the attacker to access the confidential information.

4. ***Cross-site Scripting:*** This type of security vulnerability is also known as XSS attack. The XSS attack targets a Web page

that uses a ‘form’ field to input the data from the user, processes the entered data and displays the result on the Web page along with the user input. XSS attacks can be commonly found in 'search' option of a Web site. When a user enters a keyword for search, the search option prints the result with a line - 'Results for <user_supplied_input>'. In case the user input is not displayed within a quote, then an attacker can create a JavaScript as a part of user input and embed it with the URL. This script begins to execute when a common user who is not aware of the scripting language clicks on the link. This way an attacker can steal the user’s cookies, which contains the session ID and other confidential information.

5. ***Remote Command Execution:*** This type of security vulnerability takes place when there is a weak input validation technique used in Web sites. If a Web site includes Common Gateway Interface (CGI) scripts, an attacker can easily execute operating system commands. This vulnerability is found in Web applications that are designed using Perl and PHP scripts that use the 'system' call command.

11.3 Security Solutions

Today, setting up a secured e-commerce system comes with an unexpected cost for online merchants and business owners. E-Commerce Web sites that run on Web applications have become an easy target for theft on information and

burglary. Attackers come up with new hacking techniques to steal credit cards and other sensitive customer information. Hence, it is essential to establish strict security features
in e-commerce systems for Web site owners to maintain the consumer trust.

Cryptography techniques can be used to safeguard the e-commerce Web sites. Cryptography consists of encryption and decryption techniques. Encryption converts the confidential information into a coded language that is difficult to understand by unauthorized users. Decryption, also known as reversing encryption decodes the coded information and translates back into its original form.

While encrypting a password, each alphabet or numerical character contained in the password should be shifted by a specific number of positions so that it becomes difficult to trace it.

Cryptographic systems are categorized into symmetric and asymmetric cryptosystems. In Symmetric cryptosystems, only a single secret key is shared by users engaged in secure communication. Whereas, in asymmetric cryptosystems two keys namely, private and public key are used for communication.

15. Designing and Building E-Commerce Web Site – Advanced

15.1 Introduction

E-Commerce Web sites are dominating the World Wide Web in recent years. Different users across the globe can access a single e-commerce Web site at the same time. The vendor sets up individual merchant account to advertise the products. This enables the customers to purchase items and make payments online. The Web site provides various models and designs of the products so that the customers can choose the product that meets their requirements. The mode of payment over the Internet provides a secured transaction between the customer and the vendor. Most of the product oriented companies develop e-commerce Web sites for the customers to purchase items online.

Example: Oriflame (www.oriflame.com), a Swedish cosmetics company has developed an online shopping Web site for its customers to order cosmetics across the globe. It provides a monthly cosmetics catalog listing the prices of the various cosmetic products on its Web site, for the customers to choose the items and store it in a shopping cart and make payments accordingly.

15.2 Integrating Mobile E-Commerce

Mobile e-commerce is continuing to grow at a rapid rate. Companies are constantly creating more mobile optimized Web sites that allow the customers to accomplish e-commerce transactions over mobile, instead of browsing the Internet.

Example: Shoppers can purchase any product on Web sites like Amazon.com through the mobile optimized site.

Customers accessing the site through their mobile phone should be automatically redirected to the mobile-optimized version of the site. Designers of the site should ensure that the URL of the mobile site is easy to remember.

Notes **Mobile Web sites are made accessible by:**

1. Appending the word ‘mobile’ to the main domain.
2. Using dot mobile domain with the brand name.

Mobile Internet connections can sometimes be unstable.

Example: Mobile connections get dropped when the mobile phone moves into a low signal area or runs out of battery.

Mobile Internet Connections instability will not pose a problem if someone is just browsing the data.

Example: Reading the news updates will not be affected by instability of mobile Internet connections.

While there is not much one can do to enhance mobile network coverage, the effects of dropped connections can be mitigated by doing the following:

1. Saving all details at every step of the transaction.


Example: Details of items in a shopping basket or shipping data already entered.

2. Making sure that a transaction can be resumed from the point where it was paused, without having to start again.

3. Capturing visitor's e-mail addresses or mobile phone numbers at the start of the transaction and sending them instructions to help continue an uninterrupted transaction.

4. Making sure that all the transactions that are available on the mobile site are completed in a few short steps.

Though high-end smartphones are increasingly incorporating on-screen keyboard, it is not always easy to type data like addresses and credit card numbers on a mobile phone.

To reduce the chances of the customers dropping off at this point, the data entry can be minimized by:

1. Allowing customers to log-in with the same username and password which they use for the main Web site to get shipping and billing information stored in the account.

2. Integrating with the third party billing services.

Most of the online shoppers want their transactions to be secure because of the frequent reports of credit card fraud and identity theft. Most of the shoppers seek reassurance that the online transactions are secure. Most mobile browsers do not offer the security features, while most of the desktop Web browsers highlight the secure Web sites and protect the users from visiting fraudulent sites.

The homepage of a Web site and other pages which do not ask sensitive data can be securely accessed from a mobile phone.

Customers feel comfortable if they do not have to give any sensitive data over the mobile repeatedly.

Online merchants need to practice the following guidelines:

1. When customers buy goods through the mobile site, give a mobile solution for tracking the progress of the order and delivery of the goods.

2. When customers book tickets or other services through the site, give a mobile-friendly booking confirmation e-mail. Consider mobile ticketing solutions where the tickets can be electronically stored in the mobile phone in the form of a special barcode.

3. Make sure that all the e-mails which follow up a transaction are mobile-friendly.

In mobile commerce, companies can promote and showcase their products to increase customers.

15.3 Payment Gateways

Payment gateway is the service that automates the payment transaction between the buyer and the seller. It is a third-party service, which is a system of computer processes that functions, verifies, accepts, or declines credit card transactions on behalf of the merchant through the secure Internet connections. It is the infrastructure that allows a seller to accept credit card and other forms of electronic payment. The payment gateways used for the Internet transactions are also called as an Internet Protocol (IP) payment gateway.

Electronic payment is an essential part of Mobile Commerce. Electronic payment is a financial exchange which takes place online between the buyers and sellers. The content of this exchange is usually some form of digital financial instrument like encrypted credit card number, digital cash, or electronic

cheques given by a bank or an intermediary or by legal tenders. The three factors that stimulate the interest among the financial institutes in electronic payments are decreasing technology cost, reducing operational and processing cost, and increasing online

commerce. The desire to minimize cost is one of the major reasons for the rise in electronic payments. Cheques and cash are very expensive to process and banks are looking for inexpensive alternatives.

Electronic currencies are designed as electronic analogs of cash and represent various forms of payment, supported by a bank or financial

institutions. Therefore, electronic currencies are similar to cash which is backed by a bank.

There are three types of electronic currencies:

1. ***Cash on Real-time:*** Transactions are completed with the exchange of the electronic currency.

 *Example:* Online currency exchange is electronic cash.

2. ***Debit or Prepaid:*** Users pay in advance to the banks or financial institutions.

 *Example:* Prepaid payment mechanisms are stored smart cards and electronic purses which store electronic money.

3. ***Credit or Postpaid:*** Server authenticates the customers and checks with the bank if the funds are sufficient before purchase.

 *Example:* Postpaid mechanisms are credit or debit cards and electronic cheque.

Most of the e-commerce Web sites accept credit cards. Merchants require two components to accept credit cards online:

1. ***Merchant Account:*** This allows the customers to accept credit cards, online or otherwise. For this purpose, the merchant will have to set up a merchant account with a bank. A merchant account is a term used for a business banking relationship where customer and the bank arrange to accept the credit card payments. Establishing a merchant account usually

involves understanding the business and also working with a third-party processor to arrange a mechanism for accepting the payments.

2. ***Payment Gateway:*** This is an online payment service, which connects users of the Web site with the merchant account to process the payment. It is the link between the Web site and the bank.

When a merchant submits a payment transaction to the payment gateway, it is sent through a secure connection from the Web site. When the customers submit their order they get some type of notification that the order has been submitted. The transaction data is then routed from the Website to the merchant's bank processor, which then submits their information to a Credit Card

Interchange (CCI). The CCI is an organization responsible for managing, processing, clearing, and settling credit card transactions. The CCI routes the transaction to the customer's credit card issuer, where it is either approved or rejected based on the balance available on the card. Thetransaction again goes to the payment gateway which is responsible for saving the data

and sending the results of the transaction to the customer and merchant. In the last step, the CCI will send the funds to the merchant's bank for deposit. While the payment processing routine might seem long, the whole process normally finishes in a few seconds.

Merchants must have a merchant account with the financial institution and must choose an appropriate shopping cart software as well as payment gateway to handle the transaction.

Integrated merchant accounts have a merchant account and payment gateway integrated into one service. These are more convenient, but often charge high fees.

Merchant accounts mostly charge a percentage of the transaction. They also charge:

1. Setup fee.
2. Monthly or annual fee.
3. Fixed amount per transaction.

The user should know the number of transactions before shopping and the average value of each transaction. Normally, higher volume transactions have lower fees. Some banks may be reluctant to provide merchant account to a business with no trading history. Most payment gateways have the same fees. Many charge a fixed amount per transaction rather than a percentage. They will sometimes provide extra features like fraud detection.

Did you know?

Payment gateways service can be scripted using scripting languages like PHP, Perl, and dot-Net.

Task Design a payment details form for e-commerce Web site. Consider the order is made for two products of different price.

15.4 Tracking Orders

In an online shopping store, the shopping cart program should be able to differentiate between multiple shoppers so that it can correlate the shoppers with their shopping cart at the check-out time. There are many programs to track the shopping carts:

1. ***Cookie:*** A cookie is a small computer file containing the cart number which is transmitted to the Web browser and remains on the hard disk during the visit to the store. The use of the cookies is quite widespread and will be used by most software since it is probably the most efficient method.

A few people view cookies as an invasion of privacy so, an alternate tracking method is sometimes required.

2. ***Temporary IP Number:*** The temporary IP number is automatically assigned by the Internet Service Provider (ISP) to recognize the customers when they log onto the Internet. While the customer cannot see the IP number, it will however be stored

in the store software.

3. ***Cart Number:*** Randomly-generated cart number can be appended to the URL which appears in the browser's "Location" or "Address" field. Whenever, the customers navigate to another product page, their cart number will also appear on that page.

There are some programs which maintain the state of the customers shopping throughout the year.

It is vital that the shopping cart software chosen is able to recognize shoppers by methods other than the cookie method since, a small

percentage of shoppers can have their cookies turned off. However, the cookie approach is generally preferred since it allows the shoppers to obtain their cart when they login again later. It is also important that the merchant is able to keep track of the shopper's name and address apart from the cart numbers. The software products will maintain the online database of customers. When shoppers want to place another order, a cookie on the shopper's browser will recognize them as a repeat customer and often identify them by name. Some of the database-energized sites will be able to personalize contact with the customers, like:

1. Giving filled-in billing and shopping address preferences.
2. E-mailing data about sales and special offers.

3. Presenting the shopper with the offers and product recommendations based on the previous purchases or items which are placed in the shopping cart.
4. Allowing the customer login access to past order history, present order status, packaging tracking, and so on.

15.5 Case Study

Case study is a practical study that analyzes the growth and challenges faced by the organizations during the operations process. The following sections discuss the analysis and various issues pertaining to the online shopping giants like Amazon.com and eBay.

15.5.1 Amazon.com

Case Study: A **Amazon.com**

mazon.com is an e-commerce pioneer that began in the year 1995 as a unique online book store with a plan to revolutionize the market place. It now offers various new, used and refurbished products in different categories like books, DVDs, electronic gadgets, apparels, jewelry, sports, and so on. It now ships millions of products to more than 200 countries.

Through the use of a unique business model when online retailing was a new concept, the organization looked to

minimize overheads while capturing a key demographic group on a global scale. The online model gave the opportunity to offer increased customer choice beyond the traditional retailer and mail order companies.

The Web site initially concentrated on selling books online. It provided an option for the customers to view the preview of the books and purchase the books online. The Internet search technology allows customers to access the entire database of books.

Amazon has made strategic acquisitions to gain dominance in research and technology. Being a customer centric organization, Amazon has incorporated many advanced and innovative techniques like one-click technology, reviews, personalization, search options, browsing

opportunities, auctions, and merchant partnerships that attracted more customers.

Amazon's success is based on strong core values like customer satisfaction, employee enthusiasm,operational efficiency, and effective Web strategy. Some of the tactics that were used by the organization to enhance its competitive advantage and overall growth are:

1. Offering products at competitive prices.
2. Marketing quality products that attract customers.
3. Providing hassle free services that satisfy the customer needs, fulfill expectations and resolve any problems at a faster rate.

4. Applying technology to make ordering secure, easy, and efficient.
5. Growing through strategic alliances and acquisitions.

Amazon.com offers an online catalog of various products and information. The home page of the site is a hub that links to catalogs of different product or services. The different functionalities of the site make it unique. The configuration e-mail facility keeps the users informed and maximizes their trust in the overall fulfillment process.

The fulfillment process mainly provides customers a confirmation mail which clearly states the product purchased, time, date, price, shipping details, and mode of payment. The login screen of the Web site provides an enhanced feature for the non - members or new customers trying to log into the Web site.

Amazon.com presents two questions to the customers logging into the Web site in a linear order.

1. What is your e-mail address?
2. Do you have an Amazon.com password?

The users can respond to any one question. According to the membership status of the customer, the Web site allows complete access or partial access to the Web site.

Amazon.com is the globe's largest customer centric organization that focuses on customer relationships.

The advanced functionality of the Web site tracks the browsing and purchase history of its customers and the collaborative filtering systems computes the similarity of preferences among different individuals. This process allows the organization to create a unique experience for every individual by suggesting products likely to interest that person. The suggestions are either made in real time when the users navigate the site or through e-mails.

The option of recommending related books at the end of each book review interests the customers and also creates a tremendous cross-sell and up-sell opportunity for the Web site.

The powerful A9 search engine of Amazon.com allows site visitors to easily search for the desired product or services. The landing page is colorful and contains lot of information that is relevant to the products.

One-Click ordering facility allows the registered users to check shipping and billing information without any hassle every time they make a

purchase. The shipping of the products is prompt and confirmed with tracking information through e-mail to the customers. Any queries, problems, refunds, or complaints are handled quickly and satisfactorily.

Main Reasons for Amazon's Success

Amazon.com has been successful mainly due to the diversity of its business, which applies to both the products offered and the architecture used. Its operational practice also incorporates diversity.

Originally known as a book retailer, the organization moved into alternate media to expand the scope of its business. Amazon's acquisition of an Internet movie database company is an instance of this. Amazon found an opportunity to widen its customer database through direct marketing which gave it the opportunity to target the various market demographic categories using a limited marketing expenditure.

In Amazon.com, a review function allows its patrons to rate and discuss books, films or music online in order to share their feedback with others. This function is cited as the primary reason for Amazon.com having more than doubled the number of users when compared to other primary retail sites. However,

the system for the user reviews has been criticized due to the opportunity for abuse that the functionality gives. This has been evident in the

previous years with authors and musicians inflating reviews for their own products under anonymous names in order to stimulate sales.

The following are some of the patents of Amazon.com:

1. System and method for conducting a discussion relating to an item.
2. Internet based referral system to customers.
3. Method to produce sequenced queries.
4. Method to gather data around forms and search barriers.

Questions:

1. "Marketing tactics enhance the organization's competitive advantage and overall growth." Justify.
2. "Amazon sells used books to its customers alongside the new versions." Is this a sensible business.

practice, or does it unfairly undermine the market for new books? Analyze.

15.5.2 Ebay.com

 *Case Study* **: Ebay.com**

eBay which has become the leader of the online auction industry was founded in 1995 by Pierre Omidyar. It has created a powerful platform for the sale of goods and services by a

passionate community of individuals and businesses. eBay aims to increase its gross merchandise volume and net revenues.

Detailed objectives are defined to achieve these aims, with strategies focusing on:

1. ***Acquisition:*** Increase the number of newly registered users on the eBay Marketplace.
2. ***Activation:*** Increase the number of registered users that become active bidders, buyers or sellers on the eBay Marketplace.
3. ***Activity:*** Increase the volume and value of transactions that are conducted by each active user on the eBay Marketplace.

At the end of 2007, eBay had approximately 83 million active users, compared to approximately 82 million at the end of 2006. An active user is any user who has bid, bought, or listed an item in the current 12-month period.

eBay is famous for its core service which enables sellers to list items for sale on an auction fixed price basis. It gives buyers an opportunity to bid for and purchase items of interest.

Software tools are provided, particularly for frequent traders which include Turbo Lister, Seller's Assistant, Selling Manager and Selling Manager Pro. Tools that are used to help automate the selling process include the Shipping Calculator, Reporting tools, and so on. Today, over sixty percent of listings

are done with the help of the software. This proves the value of automated posting for frequent trading.

eBay has developed "Trust and Safety Programs" which are very important to give assurance to the customers since online services are prone to fraud. In case of any fraud, eBay works with law enforcement and government agencies to enforce its policies. eBay has developed many programs and resources to ensure the safety of trade and to help in building trust.

eBay Feedback

Each member of the eBay Web site has a feedback score that is displayed in the seller information box of the item listing page. It helps to build trust among the people involved in trading.

Spoof Web site Protection

The eBay toolbar enables its members to protect their accounts by warning them when they are on a potentially fraudulent or spoof Web site.

eBay Security Center

The eBay security center provides guidance to its members on buying, selling, and paying safely. It is a valuable resource for all the users. To protect the user from threat, Rapport online browsing

protection is provided by the security experts at Trustier. Rapport secures the user communication with eBay. It

blocks malicious programs from stealing the financial information. To take advantage of the protection offered by Rapport, the user needs to download and install the Rapport plug-in for Windows or Mac.
Rapport doesn't alter the user's experience on eBay. Once installed, it operates quietly in the background to protect the user's communication with eBay's site and participating financial sites. Rapport works in conjunction with the user's existing antivirus software and firewall.

Competition

Currently eBay is facing a problem in creating a business plan to maintain their position as the leader in the online auction industry. There are both direct and indirect competitors of online auction services. As per eBay (2005) competing channels are, online and offline retailers, distributors, liquidators, import and export companies, auctioneers, catalog and mail-order companies, classifieds, directories, search engines, products of

search engines, virtually all online and offline commerce participants, online and offline shopping channels, and networks. Some of the competition that eBay is facing are sites such as Yahoo Auctions, Overstock.com, Craigslist, Google, and Amazon.com.eBay is not a free site.

Sellers have to pay monthly fees, which in turn can increase the cost of the items being sold. On the other hand, sites like Craigslist are completely free which is increasing its popularity.

Questions:

1. How has eBay been able to maintain its dominant position?
2. What method does eBay use to reduce the potential for fraud by traders on its site?

5. Electronic Commerce Technology_Part1

5. Introduction

There are three types of communication networks (internet, intranet and extranet) used for electronic commerce, depending on whether the intent is to support cooperation with a range of stakeholders, cooperation among employees, or cooperation with a business partner. Each of these topologies is briefly described, and we discuss how they can be used to support electronic commerce.

5.1 Internet Technology

Computers can communicate with each other when they speak a common language or use a common communication protocol. Transmission Control Protocol/Internet Protocol (TCP/IP) is the communication network protocol used on the Internet. TCP/IP has two parts. TCP handles the transport of data, and IP performs routing and addressing.

5.1.1 Data Transport

The two main methods for transporting data across a network are circuit and packet switching. Circuit switching is commonly used for voiceand package switching for data. Parts of the telephone system still operate as a circuit-switched network. Each link of a predetermined bandwidth is dedicated to a

predetermined number of users for a period of time.

The Internet is a packet switching network. The TCP part of TCP/IP is responsible for splitting a message from the sending computer into packets, uniquely numbering each packet, transmitting the packets, and putting them together in the correct sequence at the receiving computer. The major advantage of packet switching is that it permits sharing of resources (e.g., a communication link) and makes better use of available bandwidth.

5.1.2 Routing

Routing is the process of determining the path a message will take from the sending to the receiving computer.

It is the responsibility of the IP part of TCP/IP for dynamically determining the best route through the network. Because routing is dynamic, packets of the same message may take different paths and not necessarily arrive in the sequence in which they were sent.

5.1.3 Addressability

Messages can be sent from one computer to another only when every server on the Internet is uniquely addressable. The Internet Network Information Center (InterNIC) manages the assignment of unique IP addresses so that TCP/IP networks anywhere in the world can communicate with each other. An IP

address is a unique 32-bit number consisting of four groups of decimal numbers in the range 0 to 255 (e.g., 128.192.73.60). Humans can more easily remember addresses like uoitc.edu.iq A Domain Name Server (DNS) converts uoitc.edu.iq to the IP address 192.169.152.125. The exponential growth of the Internet will eventually result in a shortage of IP addresses, and the development of next-generationIP (IPng) is underway.

5.2 Infrastructure

Electronic commerce is built on top of a number of different technologies. These various technologies created a layered, integrated infrastructure that permits the development and deployment of electronic commerce applications (see figure (5.1)). Each layer is founded on the layer below it and cannot function without it.

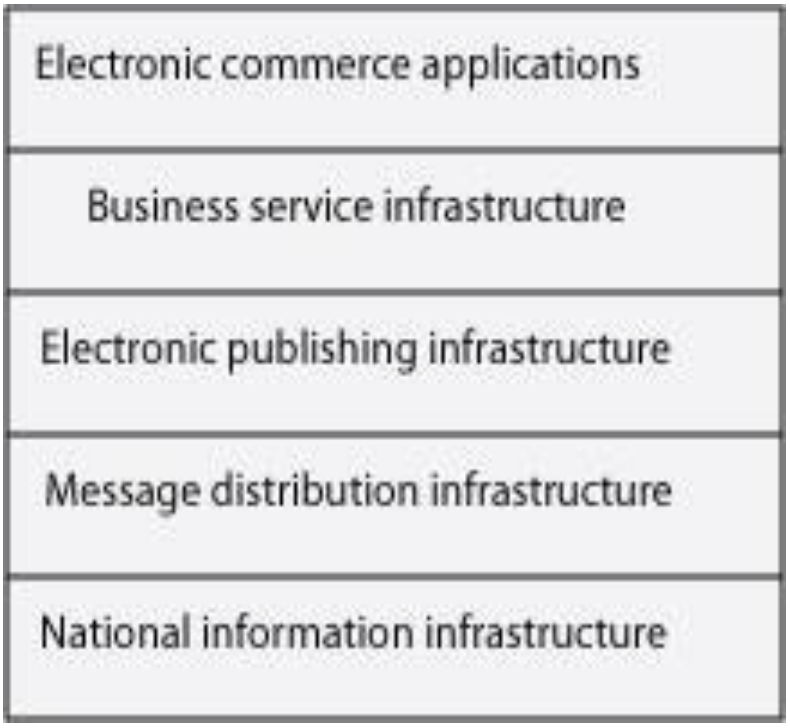


Figure (5.1) E-Commerce infrastructure

5.2.1 National Information Infrastructure

This layer is the bedrock of electronic commerce because all traffic must be transmitted by one or more of the communication networks comprising the national information infrastructure (NII). The components of an NII include the TV and radio broadcast industries, cable TV, telephone networks, cellular communication systems, computer networks, and the Internet. The trend in many countries is to increase competition among the various elements of the NII to increase its overall efficiency because it is believed that an NII is critical to the creation of national wealth.

5.2.2 Message Distribution Infrastructure

This layer consists of software for sending and receiving messages. Its purpose is to deliver a message from a server to a client. For example, it could move an HTML file from a Web server to a client.

Messages can be unformatted (e.g., e-mail) or formatted (e.g., a purchase order). Electronic data interchange (EDI), e-mail, and hypertext text transfer protocol (HTTP) are examples of messaging software.

5.2.3 Electronic Publishing Infrastructure

The Web is a very good example of this layer. It permits organizations to publish a full range of text and multimedia. There

are threekey elements of the Web:

• A uniform resource locator (URL), which is used to uniquely identify any server.

• A network protocol.

• A structured markup language, HTML.

5.2.4 Business Services Infrastructure

The principal purpose of this layer is to support common business processes. Nearly every business is concerned with collecting payment for the goods and services it sells. Thus, the business services layer supports secure transmission of credit card numbers by providing encryption and electronic funds transfer. Furthermore, the business services layer should include facilities for encryption and authentication.

5.2.5 Electronic Commerce Applications

Finally, on top of all the other layers sits an application. Consider the case of a book seller with an on-line catalog (see figure (5.2)). The application is a book catalog; encryption is used to protect a customer's credit card number; the application is written in HTML; HTTP is the messaging protocol; and the Internet physically transports messages between the book seller and customer.

Electronic commerce applications	Book catalog
Business services infrastructure	Encryption
Electronic publishing infrastructure	HTML
Message distribution infrastructure	HTTP
National information infrastructure	Internet

Figure (5.2) E-Commerce application

1. Introduction of Electronic Commerce

Ecommerce, also known as electronic commerce or internet commerce, refers to the buying and selling of goods or services using the internet, and the transfer of money and data to execute these transactions. Ecommerce is often used to refer to the sale of physical products online, but it can also describe any kind of commercial transaction that is facilitated through the internet.

The history of ecommerce begins with the first ever online sale: on the August 11, 1994 a man sold a CD by the band Sting to his friend through his website NetMarket, an American retail platform. This is the first example of a consumer purchasing a product from a business through the World Wide Web—or "ecommerce" as we commonly know it today.

Since then, ecommerce has evolved to make products easier to discover and purchase through online retailers and marketplaces. Independent freelancers, small businesses, and large corporations have all benefited from ecommerce, which enables them to sell their goods and services at a scale that was not possible with traditional offline retail.

Global retail ecommerce sales are projected to reach $27 trillion by 2020.

2.E-Commerce Categories:

1.Electronic Markets

Present a range of offerings available in a market segment so that the purchaser can compare the prices of the offerings and make a purchase decision.

Example: Airline Booking System

2.Electronic Data Interchange (EDI)

Electronic Data Interchange (EDI) is the electronic interchange of business information using a standardized format; a process which allows one company to send information to another company electronically rather than with paper. Business entities conducting business electronically are called trading partners.

- It provides a standardized system
- Coding trade transactions
- Communicated from one computer to another without the need for printed orders andinvoices & delays & errors in paper handling
- It is used by organizations that a make a large number of

regular transactions Example: EDI is used in the large market

chains for transactions with their suppliers

3.Internet Commerce

- It is used to advertise & make sales of wide range of goods & services.
- This application is for both business to business & business to consumer transactions.

Example: The purchase of goods that are then delivered by post or the booking of tickets thatcan be picked up by the clients when they arrive at the event.

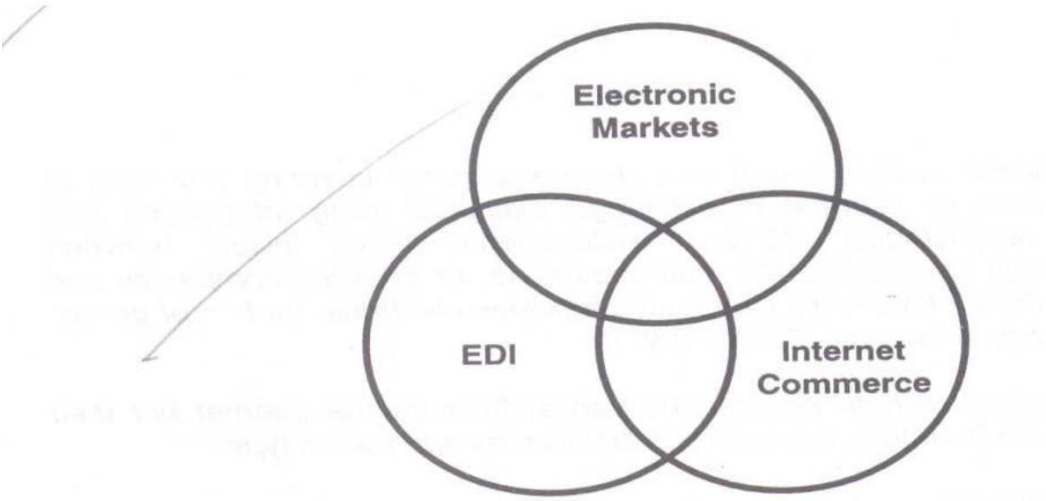


Fig. 1.1 The three categories of e-Commerce.

3. Advantages of E-commerce:

- Buying/selling a variety of goods and services from one's home or business
- Anywhere, anytime transaction
- Can look for lowest cost for specific goods or service
- Businesses can reach out to worldwide clients - can establish business partnerships

- Order processing cost reduced
- Electronic funds transfer faster
- Supply chain management is simpler, faster, and cheaper using ecommerce
  - Can order from several vendors and monitor supplies.
  - Production schedule and inventory of an organization can be inspected by cooperating supplier who can in-turn schedule their work

4. Disadvantages of E-commerce:

- Electronic data interchange using EDI is expensive for small businesses
- Security of internet is not very good - viruses, hacker attacks can paralise e-commerce
- Privacy of e-transactions is not guaranteed
- E-commerce de-personalizes shopping

5. Threats of E-commerce:

- Hackers attempting to steal customer information or disrupt the site
- A server containing customer information is stolen.
- Imposters can mirror your ecommerce site to steal customer money
- Authorized administrators/users of an ecommerce website downloading hidden active content that attacks the ecommerce system.
- A disaffected employee disrupting the ecommerce system.
- It is also worth considering where potential threats to your ecommerce site might come from, as identifying potential threats will

help you to protect your site. Consider:

- Who may want to access your ecommerce site to cause disruption or steal data; for example competitors, ex-employees, etc.
- What level of expertise a potential hacker may possess; if you are a small company that would not be likely to be considered a target for hackers then expensive, complex security may not be needed.

6. Features of E-Commerce:

➢ Ubiquity

It refers to the fact that the visitors/ customers can access a service from any place, on any device, anytime.

➢ Global reach

The technology reaches Commerce to be enabled across cultural and across national boundaries, around the earth. The Internet allows the company to market themselves and attract new customers to their website where they can provide product information and better customer service.

➢ Universal standards

The universal standards of the internet and e-commerce greatly provide lower market entry costs which is the cost that merchants must pay simply to bring their goods to the market. At the same time, for consumers, universal standards reduce search cost which is the effort required to find suitable products.

- **Richness**

Video, audio, and text marketing messages are possible. integrated into a single marketing message and consuming experience.

- **Interactivity**

It allows two-way communication between merchant and consumer which was not afforded through traditional mediums such as newspapers, magazines, radio ads and television. Television for instance, cannot ask viewers any questions or enter into conversations with them and it cannot request that customer information be entered into a form. In contrast, all of these activities are possible on an e-commerce website. Interactivity allows an online merchant to engage a consumer in ways similar to a face-to-face experience but on a massive and global scale.

- **Information density**

Information density in e-commerce markets make prices and costs more transparent. Price transparency refers to the ease with which consumers can find out the variety of prices in a market. Cost transparency refers to the ability of consumers to discover the actual costs merchants pay for products. Many see price and cost transparencies as a benefit to consumers, but many businesses do not want this form of information made public, limiting strategic initiatives and possible related advantages.

14. Designing and Building E-Commerce Web Site – Basics

14.1 Introduction

E-Commerce Web sites provide an excellent mode of expanding business across the globe. The customers around the world can access the e-commerce Web site for shopping and various other purposes. E-Commerce Web sites provide a virtual mode of shopping that deal with purchase of various products or services. Building e-commerce Web sites require various tools and features for making it user-friendly and attractive to the customers. Every shopping Web site provides a virtual trolley or a shopping cart that stores the products selected by the customers online. The cart with items stays visible until the customer makes the payment online.

14.2 Designing and Building E-Commerce Web site

Web site technologies provide an opportunity to build Human Machine Interfaces (HMIs) using new technologies with high speed communication links to connect business with the global market. Creating a Web site involves many tradeoffs involving the choice of hardware and software while developing and running the Web site, type of audience, visual design of the site, and so on. A team dedicated for Web site development must be skilled to make the organization's tradeoffs effectively.

The main goal of building an e-commerce Web site is to present functionality and content through some type of visual interface. An organization must consider the following factors before developing an e-commerce Web site:

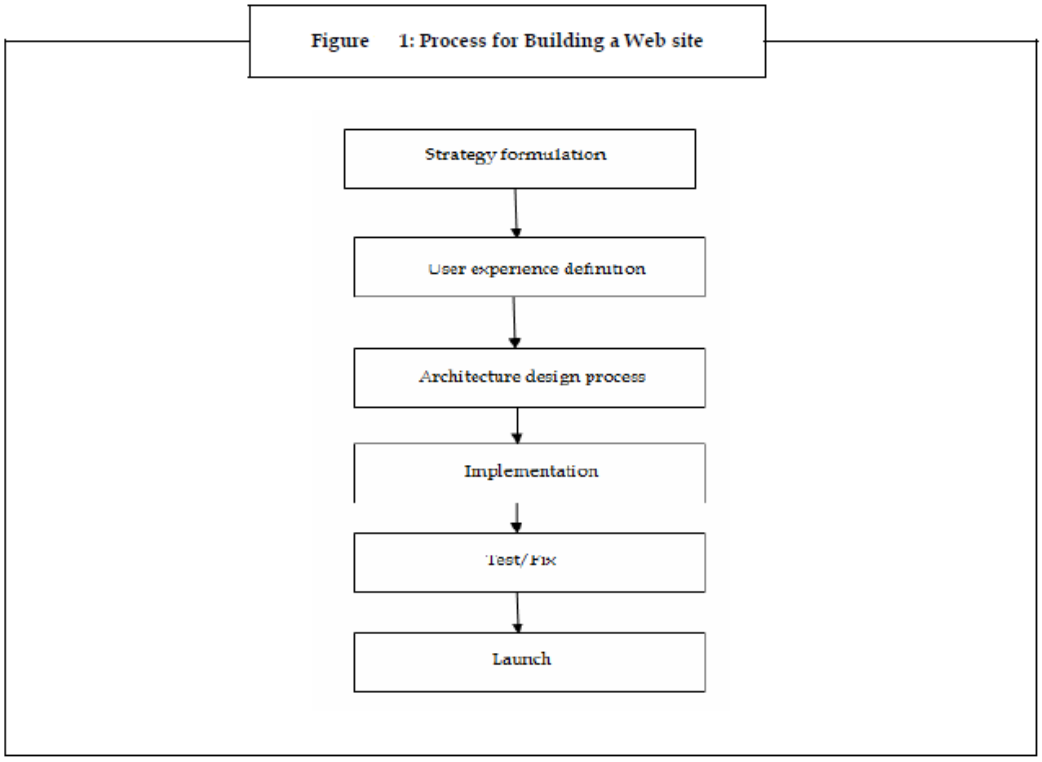
1. The organization must make a survey in the market and analyze the types of audience that the Web site will serve.
2. The organization must analyze the competing organization's market standards.
3. The organization must identify necessary requirements to market its products globally over the Internet.
4. The customers must be provided with a secure mode of payment over the Internet.
5. The organization must employ skilled professionals for developing its Web site.

The process of building a Web site must consider certain aspects such as:

1. A finite set of business objectives for developing a site.
2. A clear and well-defined project plan with checkpoints and milestones.
3. Appropriate budget plans.

The process of building Web site consists of a sequence of methods that are deployed in the development process.

Figure.1 depicts the process for building a Web site.



The initial step in the process of building a Web site deals with framing strategies. The strategies are the foundation for building an e-commerce Web site. It binds the team members and process into certain rules through which the organization executes the process effectively. The next step deals with analysis of the user experience. This step is necessary as it enables the development team to understand the requirements of the users. The information gathered in the first two phases is carried into the next step which is called architecture design. This phase mainly deals with designing the blueprint for the Web site. It includes translation of raw data into functionality and screen representations. The next phase is the implementation phase which deals with building the actual Web site. It includes

template designing, backend coding, content writing, and integrating security network for the Web site, and so on. The Web site is then tested repeatedly until it is considered acceptable. Once the Web site is in the acceptable form, it is launched.

The site design must combine multimedia features, functions, and content. The team developing the site must be given sufficient time and place for performing the given task. Adequate time and space enhances the output of the Web site development, which in turn will be in a useful format for the end users. A clear understanding of the business objectives provides an easy flow of developing the Web site.

 *Example:* ESPN (www.espn.com) created its Web site after clearly identifying the type of audience it would cater to. Most of the audience logging into the Web site are sports fans and are primarily interested in reading sports related articles, updates on new sports wear and accessories, game summaries, and so on. Hence, the homepage is designed in such a way that users are provided with options to access the detailed content or navigate to other page which can be of interest to the user. There are various additional components for the site development process which includes:

1. ***Functional Specification***: It provides a detailed description of necessary information that needs to be included in each page of the Web site. The functional specification document is similar to

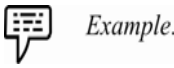
the blueprint required for developing the Web site. It also provides the rules to be applied for esigning the Web page and its functionalities. The functional specification additionally defines every action that is carried out in the Web page, which includes page navigation, selecting an item, providing information about the product, ensuring secured payment, adding to shopping cart, calculating shipping charges of the product, and providing the end user with detailed information about the product and the process of purchase and payment.

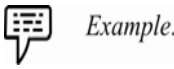
2. ***Change Management Process***: It acts as a framework for identifying the problems within the project. It involves identifying software bugs or changing the site according to the new requirements. The problems are identified and prioritized according to their severity and are assigned to a team for resolving and maintaining an error free site. To make any changes or further developments to the Web site after its release in the market, it is important to obtain an approval from the Change Management Board.

3. ***Project Plan***: It deals with designing checkpoints and resources while analyzing the requirements to build a Web site.

The project manager proactively uses various planning methods to manage the expectations of stakeholders and the development team, to identify the project bottlenecks, to flag the resource constraints, and to spot project dependencies. Project planning helps to break down the large task into small discrete

components such that the progress of the project can be measured easily.


Example: Dell is a pioneer in direct marketing of computers online. It sells products worth $30 million every day. The company gained huge profits due to its ability to customize orders and set standards for online computer retailing. Dell's customer support section known as www.support.dell.com contains a feature called Ask Dudley. It mainly handles technical queries from customers who have purchased Dell's products.


Example: QVC is a leading e-commerce Web site that provides television based shopping of various products. It markets a wide variety of products in various categories suchas electronics, jewelry, cosmetics, home furnishings, and so on. It has an additional feature known as "Watch Live TV" that provides an option to watch TV live while shopping online.

14.3 Managing Products

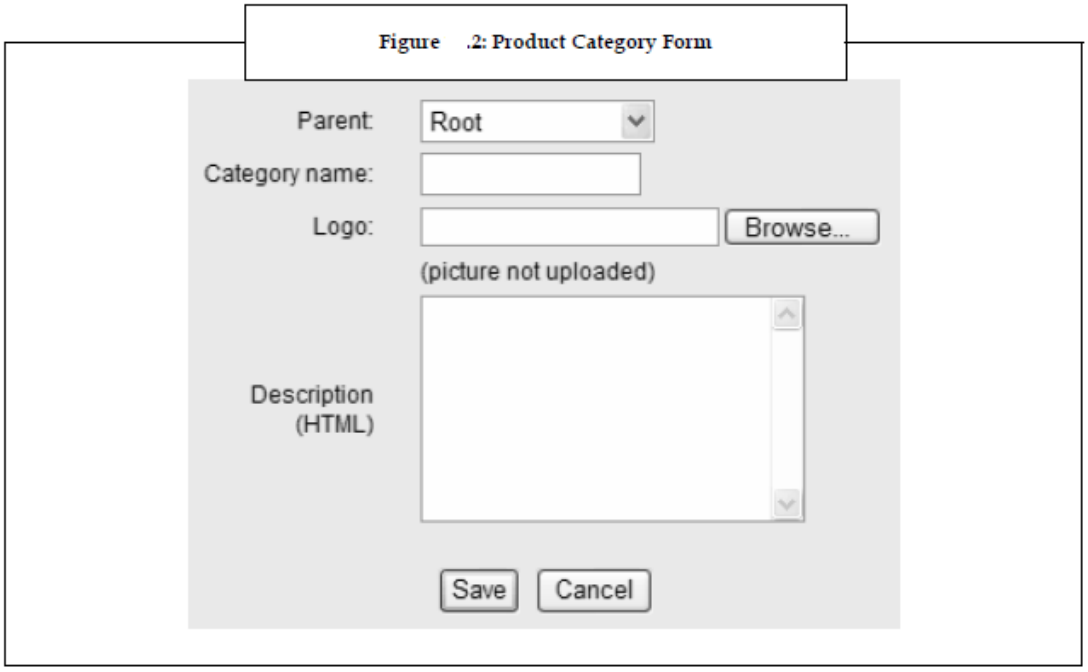
In an e-commerce Web site, every business transaction is done online which includes marketing, shopping, payments, and shipping. Therefore, it is important for a Web site to contain all these necessary features to deal with these requirements. The outlook of the online store must be professional to encourage customers to shop through the Web site. The graphical user interface of the Web site must be unique in order to ensure that the customers purchase more products. The products must be

displayed in a user-friendly manner for the customers to access the products conveniently. E-Commerce Web sites contain various products that are listed for the customers to view and purchase. Hence, it is necessary to categorize the products into related search groups so that the customers can easily search the product. The basic architecture of the Web site application includes designing product catalog that provides details of the products. To create such a catalog, it is important to design architecture that involves the following procedure:

1. Design a database for storing product catalog that are sub-divided into various departments and categories.
2. A Structured Query Language (SQL), Hypertext Preprocessor (PHP), HTML, JavaScript, Ajax, CSS code is written to access the data and make the product catalog functional.
3. Add data to the product catalog that defines product attributes such as color, size, and so on.
4. A product search engine must be provided and the site administrator must be provided with a private section in order to manage the online product catalog. Once the catalog is built, the next step is to offer products for sale by integrating the products with shopping cart functionality and order-processing system. This will help to handle credit card transactions and e-mails with details of orders. The products must be categorized to maintain the product information for effective browsing in the Web site. The merchant is provided with a product category form during

the process of adding a new product to the Web site. The figure.2 depicts the product category form of an e-commerce Web site which helps in categorizing the products according to the listed category in the Web site.

Figure .2: Product Category Form



In the figure.2, the product category form is used by the manufacturers to advertise their respective products on the Web site. It consists of Parent, Category name, Logo, and Description of the category.

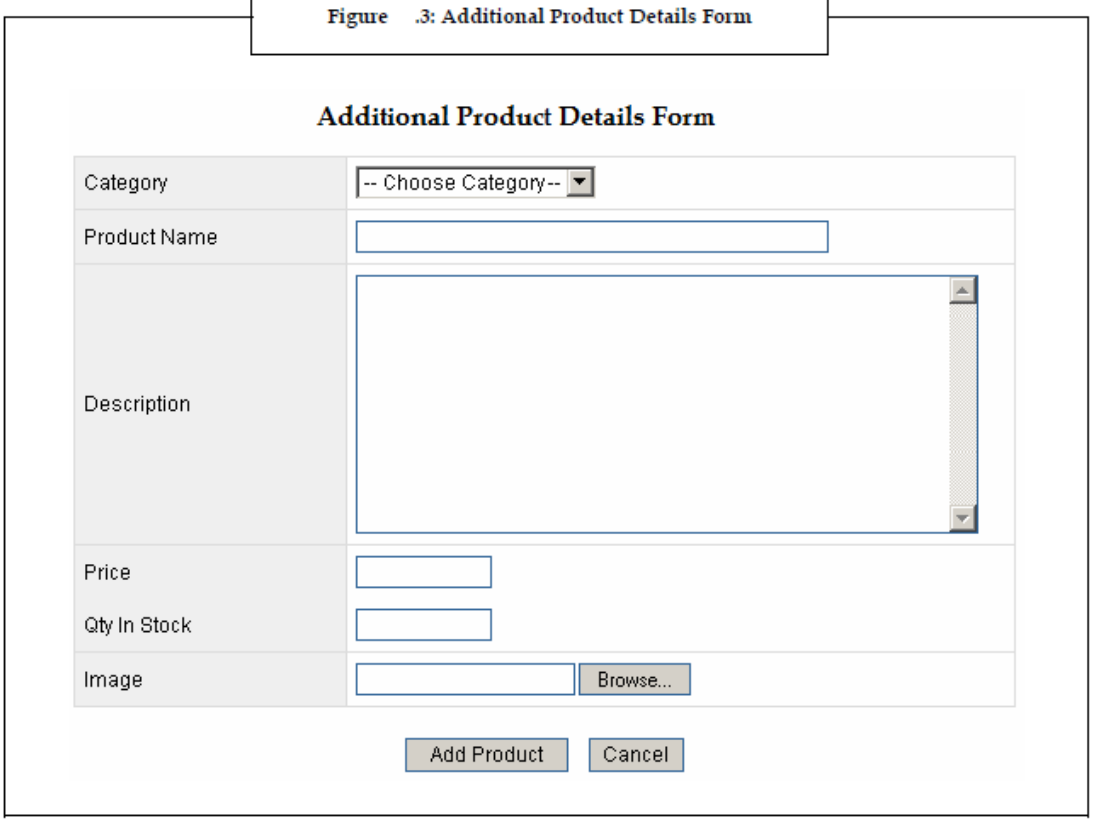
The Category Name specifies the category in which the product can be advertised. Description refers to the description of the product and the picture URL links the Web page to the specific image of the product.

Example: A car dealer wants to enter the details of Maruti Zen. The dealer must enter Maruti Zen for the Category Name and the car description which describes the type and model of the car.

The manufacturer must provide the URL of the image of a Maruti Zen car for the Category thumbnail or image URL to link to the car Web site containing the product.

Once the product category is created, then the products to be advertised must be assigned to the product category while configuring the product details. The figure.3 depicts product details form which helps the customers to identify the product in the specific category.

Figure .3: Additional Product Details Form



In the figure.3, the additional product details are entered for the created product category. It consists of Category, Product Name, Description, Price, Quantity (Qty) in Stock, and Image of the product. The form displays the product description which was

entered in the product category form. The manufacturer can select the product category to which the product needs to be assigned from the Category drop down list. The products entered in the Category list are displayed to the customer.

Figure .4 Product List Displayed to the Customer

In the figure.4, the Web site displays the description of the product, image, price, and license of the product which was entered earlier by the vendor. An option is provided to the customers to add the particular product into the cart.

The product production and services depends on control function management, operations management, and configuration management. Control function management mainly deals with controlling variety of ongoing management activities to co-ordinate operations in the Web site.

Operations management in Web site deals with wide variety of operations. Configuration management deals with tracking the new versions of products and services which includes updating, deleting, and configuring the product and its information in the Web site.

The product management in a Web site must contain the details of the products and the manufacturer for the customer's awareness regarding the manufacturers of the product. In order to maintain the details of the manufacturer, a separate category must be created. A panel is developed in the Web site that contains the manufacturer information in a particular category form.

In the figure.5, the manufacturer category form contains information which includes category name and category description. The manufacturer must enter the category of the product which is to be advertised on the Web site with description. In this example, 'Publishers' is given as the Category Name. The Category Description contains the description of the publisher which is specified as a Manufacturer of books, CDs, and information products. The information provided to the customers must be stringent and clear so that there is no ambiguity among the customers. Hence, it is very important to add the manufacturer information so that the products being advertised in the Web site seem original. Once the manufacturer category form is filled, the next step is to add the manufacturer information.

Figure.5 is a snapshot of manufacturer's information form which is filled by the manufacturer during the process of adding product to the Web site.

Figure .5: Manufacturer Category Form of VirtueMart

If such a form is expanded, it should contain the manufacturer name, URL of the company, category of the manufacturer, description of the manufacturing company, and customer support e-mail id for the customers to send their queries directly to the manufacturer. Once the manufacturer information is added, it gets updated in the Web site and the customer can choose the products with complete details.

Example: VirtueMart is an e-commerce Web site. It offers various products for sale with advanced features of product management. The VirtueMart Web site contains a manufacturer category form in which the details of the manufacturer advertising the product are entered before publishing the product for sale. The figure.5 is a snapshot of the manufacturer category form present in the VirtueMart Web site.

The products are updated in the Web site according to the release of its new versions and variable changes in the prices.

14.4 Database

A database is mainly required to store and update large quantities of data. The online Web sites dealing with buying and selling of products provide great importance to database. The database management system is a systematic approach of storing, accessing, and retrieving data effectively. The database management systems consist of a data warehouse that archives the data provided by the manufacturers regarding the product. The data is classified, summarized, and categorized in the data warehouse so that the end users are provided with information at a faster rate.

The database stores the information of the product, manufacturer, and customers who regularly visit the Web site, and so on. It provides a convenient mode of transaction over the Internet to locate, purchase, make inquiries, and review the products or services. It provides greater access for choosing various products that are stored in the database. The designing of e-commerce Web site database usually consists of four primary tables. They are:

1. ***Customers Table:*** It stores the information of the customer logging into the Web site like customer's residential address, billing address, shipping address, and so on.

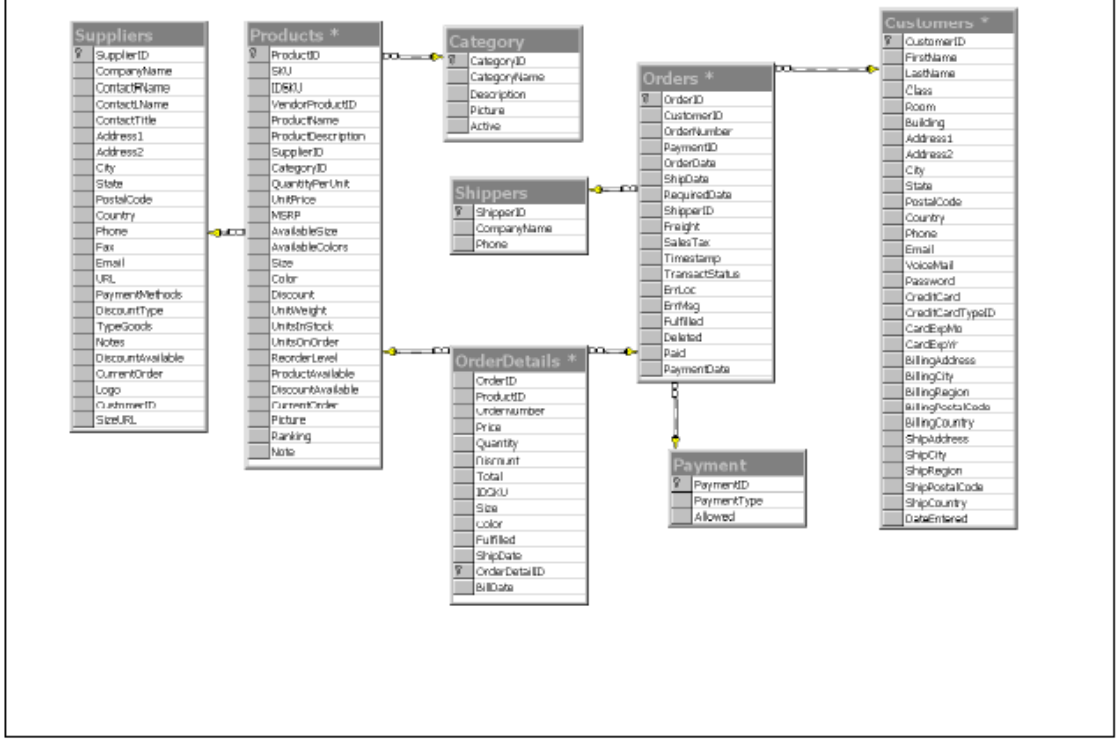
2. ***Products Table:*** It stores the product information such as description, size, color, price, and so on.

3. ***Orders Table:*** It stores the information regarding customer ID, date of order, shipping date, and so on.

4. ***Order Details Table:*** It stores information on each product ordered which includes quantity, price, any discounts on product, and so on. The attributes of the data must be entered while designing the database so that the searching process of the customers can be done easily.

The figure.6 depicts the schematic diagram of the relational database in which the products and its details are stored. Each table is interrelated such that the customer is provided with complete details of the product, payments, and shipping process.

Figure .6: Relational Database



14.5 Shopping Cart Applications

A shopping cart is a piece of software that helps in simplifying the shopping process for an online customer when purchasing multiple products or services from a merchant's Web site. It provides an interface between a company's Web site and its deeper infrastructure. It allows consumers to select merchandise, review the selected merchandise, and purchase the merchandise.

Basically, a shopping cart is a software that allows merchants to list their products on a Web site and then automatically collect fees when a customer buys products from their Web site.

Example: Assume that you have a grocery shop, and now you want to start selling grocery products on a Web site. To do that, first, you must have shopping cart software.

You must also have a business bank account, payment gateway, and a service that allows you to automatically process credit cards on the web site.

Once you have the shopping cart software set up on the Web site, you can add grocery products to the Web site using a Web browser. The software allows you to include images, description, prices which are stored in database and recalled on structured queries. Shopping cart is as good as a shopping basket as it holds the products.

Customers log into the Web site and add products to their shopping cart. When they are ready to buy the products, they enter their shipping and credit card information in a form. This enables the merchant to know where to ship the product and whom to charge it to. Once the customer clicks the button to submit the order, the shopping cart uses the payment gateway and credit-card-processing service, to validate the credit card and then transfer the money from the customer's credit card to the merchant's bank account.

Shopping carts are written in different types of programming languages. Some of them give full access to the source code and thus, allow experienced programmers to make modifications to the system features. Some shopping carts run on Windows Web servers, some on UNIX, and others on both. In most cases, the merchant can place the shopping cart on a Web server by transferring the source code files into the server using any File Transfer Protocol (FTP) software.

Example: Product Cart, shopping cart software, is a collection of files written in a programming language called Classic ASP. An e-commerce merchant can host that software on a Windows server. As the source code is included, the experienced programmers can customize the system as per their choice.

Normally all the shopping carts share the same structure. The structure includes:

1. A database that stores information such as product details, customer data, order information, and so on.
2. A storefront that displays the stored information.
3. An administration area that allows the store administrator to manage the store by adding products, setting up shipping and payment options, and processing orders.

As most of the information is stored in a database, the shopping cart creates pages dynamically as per the requirement of the customer. Apart from the HTML pages that make up most of the Web site, the shopping cart pages do not exist until a customer requests one. The Web server dynamically generates the page by retrieving data from the database.

Example: X-cart is shopping cart software that is template based with open source code. It means that the look and feel and functionality of the shopping cart can be changed according to the business requirements.

14.6 Shipping Calculation

In the last few years, the shipping calculations have become more sophisticated. All the up-to-date carts include the following two types of shipping calculations:

1. Calculation from the look-up tables which is set up by the merchant.
2. Real-time calculations that take information from the major shippers and couriers.

Generally, shipping calculations from look-up tables which are set up by the merchant, work perfectly well. Shipping costs may differ from those in the look-up tables. However, in the long run, these cost differences even out. Shopping carts often include a wide variety of shipping calculations which can be grouped by:

1. Total sales.
2. Number of items in the order.
3. Weight and zone.
4. A fixed shipping price for all products.

The merchant has to select the particular system of grouping shipping calculations that applies to all their products. Some of the carts add a shipping surcharge to selected products that are especially bulky or require special crates or shipping containers.

Many merchants go for the by weight system and find it most flexible especially, when they have a number of products that are dissimilar in size and shape.

The merchants can also use the plug-ins supplied by some of the major shippers. The shipping companies offer a service to online merchants that estimate shipping costs, depending upon the type of service the customer selects, like shipment on the same day or the next day, and so on.

4. Content Management System

Good website content is critical because it is a process of creating and distributing digital materials online to directly or indirectly promote a brand,product, or service. When the websites are accessible, easy-to-use, and credible, it has the potential to make the most out of the marketing and salesefforts.

How do we ensure that we reach these and other marketing goals? It's quite simple; we need to build our websites using a content management system (CMS). So what's a CMS and how does it impact our online stores? This lecture will familiarize you with the capabilities of the software in order that you make the right decisions before building your E-Commerce website.

4.1 Introduction of Content Management System (CMS)

CMS is a computer application that allows publishing, editing and modifying content, organizing, deleting as well as maintenance from a central interface. Such systems of content management provide procedures to manage workflow in a collaborative environment. CMSs are often used to run websites containing blogs, news, and shopping. Many corporate and marketing websites use CMSs. CMSs typically aim to avoid the need for hand coding, but may support it for specific elements or entire pages.

4.2 CMS Features

There are 5 key features that a CMS should incorporate in order for you to take control of your E-Commerce store's look, feel, navigation, and content.

1. Content Builder: A CMS platform allows to create beautiful webpagesand blog/news posts. CMS platforms create fully responsive layouts for both desktop and mobile, with drag & drop functionality, without the needfor any design or programming knowledge.

2. Membership/account access: CMS provides for customers exclusiveaccess to content, driving sales a securing high-value content.

3. Theme Builder: CMS theme builder gives users access to hundreds oftheme options that can be customized without any special coding skills.

4.3 Web Traffic

Web traffic is the amount of data sent and received by visitors to a web site.Web traffic is measured to see the popularity of web sites and individual pages or sections within a site. This can be done by viewing the traffic statistics found in the web server log file, an automatically generated list of all the pages served. A hit is generated when any file is served. The following types of

information are often collated when monitoring web traffic:

- The number of visitors.
- The average number of page views per visitor – a high number would indicate that the average visitors go deep inside the site, possibly becausethey like it or find it useful.
- Average visit duration – the total length of a user's visit. As a rule the more time they spend the more they're interested in your company and are more prone to contact.
- Average page duration – how long a page is viewed for. The more pagesviewed, the better it is for your company.
- Domain classes – all levels of the IP Addressing information required todeliver Webpages and content.
- Busy times – the most popular viewing time of the site would show when would be the best time to do promotional campaigns and when would be the most ideal to perform maintenance.
- Most requested pages – the most popular pages
- Most requested entry pages – the entry page is the first page viewed by a visitor and shows which are the pages most attracting visitors
- Most requested exit pages – the most requested exit pages could help find bad pages, broken links or the exit pages may have a popular external link

4.4 CMS Platforms

1. Magento is famous as the leading open-source E-Commerce platform. The system is developed in PHP that enables store owners to build their online businesses with ease. The platform supports all business sizes and meets business needs for B2B, Mobile Commerce, etc. Besides, Magento allows integrating with multiple extensions from the third parties, creating distinct digital retail experiences.
2. Shopify is a flexible e-commerce platform with tons of highlight features. According to the Shopify report, over 800,000 businesses worldwide use the Shopify platform. Shopify is regarded as an all-in-one eCommerce platform. Small merchants can set up their online stores, manage their products, and handle all orders in a single dashboard. Free integration with eBay and Amazon without custom code is a notable advantage of Shopify. tore owners capture positive customers and boost sales with incredible ease.

9. Internet Environment for E-Commerce

9.1 Introduction

E-Commerce is associated with conducting any transaction involving the transfer of ownership to use goods or services through a computer network or buying and selling over the Internet.

Internet based e-commerce has introduced revolutionary innovations in businesses, management, and international trade. In particular, information sharing with clients and coordination of business activities with trading partners based on shared information has managed to step up the existing level of business acumen.

9.2 Internet Environment for E-Commerce

The Internet is a collection of global networks, connected to share information using a common set of protocols. It allows individuals from all over the world to be connected economically and reliably.

The Internet is a vast network, which helps people to share information around the world. It is an enabler for e-commerce as the Internet allows businesses to showcase and sell their products and services online. The Internet also gives potential customers, prospects, and business partners access to information about the businesses and their products and services that would lead to purchase.

Before the Internet was utilized for commercial purposes, companies used private networks like the Electronic Data Interchange (EDI) to transact business with each other. That was the early version of e- commerce. However, installing and maintaining private networks was very expensive. With the advent of Internet, e-commerce spread rapidly because of the reasonable costs.

9.2.1 E-Commerce Security Environment

Ensuring security of payments and privacy of online transactions is the most vital aspect of ecommerce.

While the appropriate policies are in place to facilitate e-commerce, lack of trust is still a barrier for using the Internet to make online transactions. Moreover, credit card usage in many developing countries is still relatively low. Individuals and firms rarely engage in extensive e-commerce or use of Internet-based technologies because of the following reasons:

1. Tax evasion
2. Privacy and anonymity
3. Fraud adjudication
4. Legal liability on credit cards

9.2.2 Internet Economy Conceptual Framework

The Internet economy is a broader concept and it includes both e-commerce and e-Business. The Internet economy includes all economic activities using electronic networks as a medium for

commerce or activities that are involved in both, building the networks linked to the Internet and the purchase of application services. It is made up of three major segments. They are physical infrastructure, business infrastructure, and commerce.

The Center for Research and Electronic Commerce (CREC) at the University of Texas has developed a conceptual framework for the Internet economy, which is depicted in table.1. The framework shows four layers of the Internet economy. They are:

1. Internet infrastructure
2. Internet applications infrastructure
3. Internet intermediaries
4. Internet commerce

Table 1: Conceptual Framework for The Internet Economy

Internet Economy Layer	Layer 1 – Internet Infrastructure	Layer 2 – Internet Applications Infrastructure	Layer 3 – Internet Intermediaries	Layer 4 – Internet Commerce
	Companies that provide enabling hardware, software, and networking equipment for World Wide Web.	Companies that provide software for Web transactions.	Companies that link buyers and sellers of e-commerce and provide Web content and marketplace.	Companies that sell products or services directly to end users.
Types of companies	Networking hardware and software companies, pc and server manufacturers, Internet service providers, security vendors and fiber optics makers.	Internet consultants, Web development, Multimedia applications providers.	Market makers, online travel agents, online advertisers, portal providers.	Online tickets, fee, subscription based companies.
Examples	Qwest, AT&T, Cisco	Adobe, Microsoft, IBM, Oracle	e-Steel, Yahoo, ZDNet	Amazon.com, Dell

9.3 E-Business Enabling Technologies

E-Business involves communications and doing business electronically through the Internet. E-Business can be significantly improved by strengthening the links in the value chain between businesses (B2B) and consumers (B2C). Today's e-Business environment enables manufacturers to automate and integrate functions as never before - from customer relationship management, to supply chain management to e-manufacturing operations on the production floor. Companies use the Internet to implement Customer Relation Management (CRM) and Supply Chain Management (SCM) capabilities, which enable them to link their operations seamlessly with customers and suppliers. Traditional Enterprise Resource Planning (ERP) systems take care of internal value chain whereas, e-Businesses establishes the value chain across the market and other industries. Organizations construct their systems' architectures by integrating ERP systems with e-Business. They use Web-based interface with outside entities plus add-on modules such as CRM and SCM in the integration.

NOTE :

Information and Communications Technology

E-Commerce and e-Business are used interchangeably. However, they are distinct concepts. In e-commerce,

Information and Communications Technology (ICT) is used in inter-business or inter-organizational transactions and in business-to-consumer transactions. In e- Business, on the other hand, ICT is used to enhance one's business. It includes any process that a business organization conducts over a computer-mediated network.

9.4 Customer Relationship Management (CRM)

CRM is the business function that integrates sales, marketing, and customer service. Such integration simplifies customer interaction. Within an integrated enterprise, customer content and contact information are readily available to generate additional sales and service opportunities. Integrated business processes provide consistency and simplicity to access many communication channels available to firms today. Integration enables firms to support issues quickly and efficiently. Traditional CRM techniques use call centers and direct marketing to market goods and services to targeted audience. The Web has expanded the reach of this marketing function by enabling businesses to use software analysis tools, customer interaction data, multi-channel communications, and one-to-one interactions to market.

CRM tools integrate traditional methods of interacting customers with automated online capabilities, including product catalogs, product configuration systems, pricing engines,

proposal generators, and sales incentives and commission systems. On the other hand, customer service has a variety of enhanced services incorporated into communication channels, for example, integration of real-time audio and video with Web-based data.

The growth of CRM e-Business may be attributed to the following reasons:

1. Electronic technology is one of the main reasons for the growth of CRM. Availing of CRM e- Business facilities boosts the efficiency of the organization to a great extent. It is also cost effective and requires very little time to implement.
2. CRM is flexible and has the ability to adapt to changing environment.
3. CRM helps in tracking the purchases and in the buying and selling of products. It helps the organization to use electronic chat as a means of technical support and customer support.
4. CRM e-Business solutions give companies a well-planned and easily integrated e-Business strategy that caters to both, the customer needs as well as the corporate needs. Both these need to be adequately catered to, for the company's objectives to be fulfilled. The net result of implementing CRM e-Business strategies is satisfied customers and overall productivity.

9.5 Supply Chain Management (SCM)

Supply Chain Management (SCM) is the business function that enables a manufacturer to manage the complex network of relationships between a manufacturer and its suppliers. SCM systems allow the manufacturer to coordinate a series of transactions such as forecasting, purchasing, inventory status, change orders, shipment, and financing. The goal of SCM is increased efficiency through automated business processes that balance supply and demand.

Many enterprises are broadening their supply chain functionality to include Internet enabled transactions because of the global reach of the Internet. The Internet can draw together globally distributed information into a support structure that efficiently handles a variety of inter and intra company operations. Increased efficiency enables firms to effectively handle lower margins, increased customer demands, and unpredictable sales channels.

SCM is composed of two basic processes:

1. ***Supply Chain Planning (SCP)***: This includes advanced scheduling, demand forecasting, manufacturing planning, and transportation planning. All of these are necessary components for the effective coordination of manufacturing and supply efforts based on individual customer orders.

2. ***Supply Chain Execution (SCE)***: This process includes order planning, production, distribution management, and logistics.

All these ensure that orders flow smoothly through the system, from the supplier to the manufacturing operation and finally to the end customer.

SCM helps in the coordination of raw materials, intermediate goods, information, and financial transactions among all the organizations involved in producing a finished product. A variety of information and transportation links can be used to connect all these organizations, essentially allowing them to function efficiently as a single organization.

2.E-Commerce Models

There are mainly 4 types of business models based on transaction party:

2.1Business-to-Consumer (B2C)

In a Business-to-Consumer E-commerce environment, companies sell their online goodsto consumers who are the end users of their products or services. Usually, B2C E- commerce web shops have an open access for any visitor, meaning that there is no needfor a person to login in order to make any product related inquiry.

The common B2C business models are the online retailing companies such as Amazon.com. B2C e-commerce revenues will increase from US$59.7 billion in 2000 to US$428.1 billion by 2004.

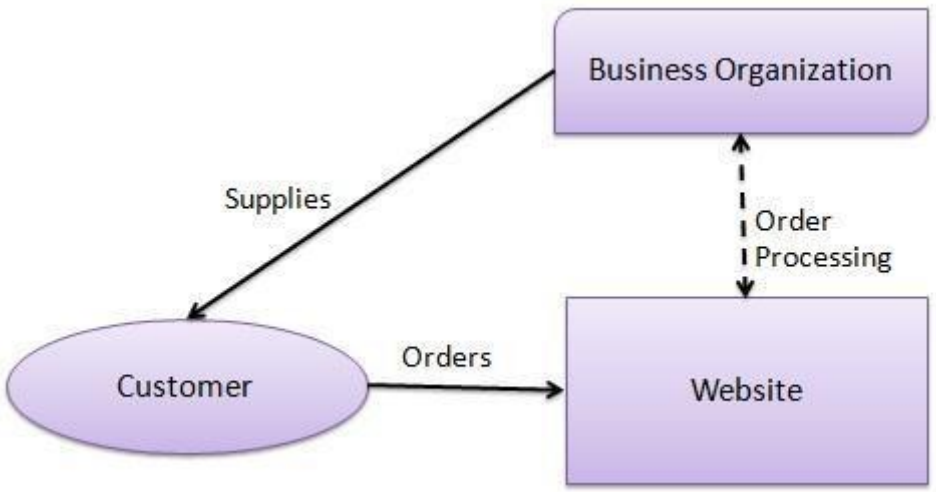


Figure (1) B2C

2.2 Business-to-Business (B2B)

In a Business-to-Business E-commerce environment, companies sell their online goods to other companies without being engaged in sales to consumers. In most B2B E- commerce environments entering the web shop will require a log in. B2B web shop usually contains customer-specific pricing, customer-specific assortments and customer-specific discounts.

The more common B2B examples and best practice models are IBM, Hewlett Packard (HP), Cisco and Dell. Cisco, for instance, receives over 90% of its product orders over the Internet. E-Marketer projects an increase in the share of B2B e-commerce in total global e-commerce from 79.2% in 2000 to 87% in 2004 and a consequent decrease in the share of B2C e-commerce from 20.8% in 2000 to only 13% in 2004.

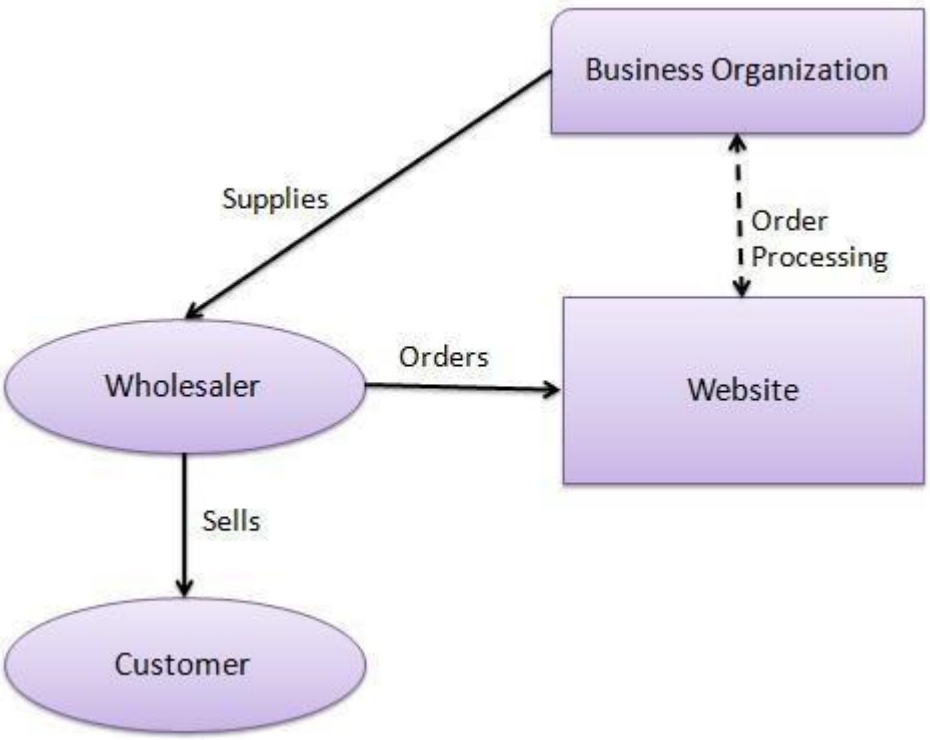


Figure (2) B2B

2.3 Consumer-to-Business (C2B)

In a Consumer-to-Business E-commerce environment, consumers usually post their products or services online on which companies can post their bids. A consumer reviews the bids and selects the company that meets his price expectations.

Elance was one of the first web sites to offer this type of transactions. It allows sellers to advertise their skills and prospective buyers to advertise projects. Similar sites such as Peopleperhour and Guru work on the same basis.

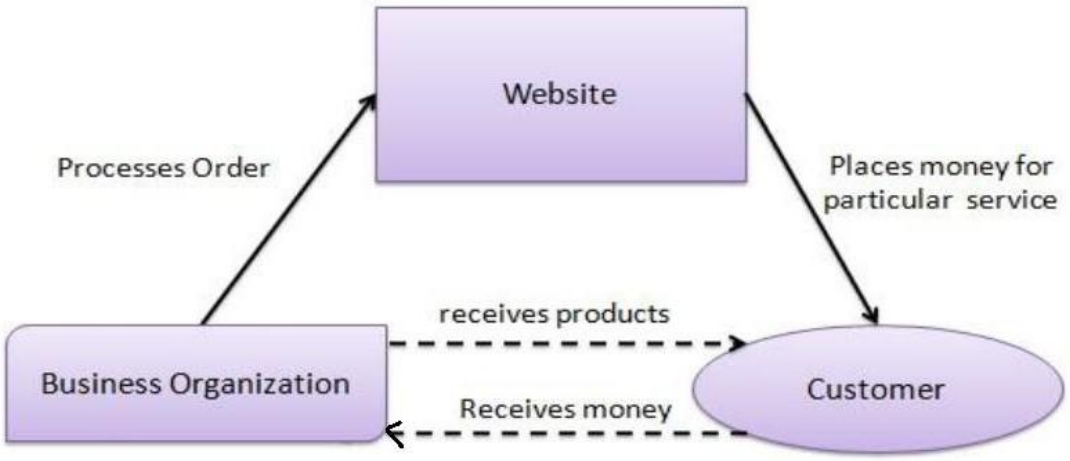


Figure (3) C2B

2.4 Consumer-to-Consumer (C2C)

In a Consumer-to-Consumer E-commerce environment consumers sell their online goods to other consumers. A well-known example is eBay.

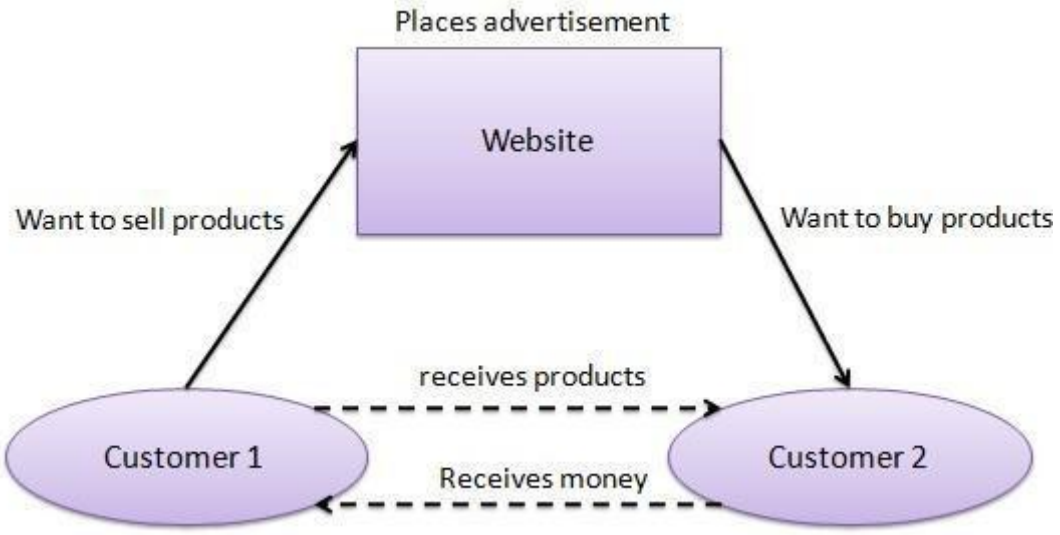


Figure (4) C2C

Differences between B2B and B2C

Business-to-Business e-commerce differs from Business-to-Consumer e-commerce in many ways.

Business-to-Consumer(**B2C)** merchants sell the products on a first-come, first-served basis and Business-to-Business(**B2B**) transactions are performed through negotiated contracts that enable the seller to think and plan for the quantity the buyer is likely to purchase. Business-to-Business(**B2B**) is a matter of making connections with business partners.

7. E-Commerce Consumer Applications

7.1 Introduction

The global consumer marketplace is spreading at a fast rate, but with its own problems. Consumer applications such as, online stores and electronic shopping malls are fast emerging but access is still inadequate in many cases. Many of the systems are not consumer friendly or well integrated. For example, it may be feasible to browse the site of an e-store via the Web, but there may be no directories or catalogs to search for the specific address of the store. Such lack of integration forces the consumer to spend more time searching for stores and online information. There is no standardization of electronic payment methods on the Web and the security of online payment still remains a major concern. These basic issues need to be resolved.

Some fundamental business issues must be addressed before consumer-oriented e-commerce can become widespread. These are:

1. Establishment of standard business processes for buying and selling products and services in electronic markets
2. Standardization of protocols for order-taking, online payments and service delivery
3. Development of privacy and security methods for secure transactions In other words, to make consumer-oriented e-commerce more effective, we need to understand the

components of the business process, the technology and the integration of the two.

Table.1 shows the classification of consumer-oriented e-commerce applications.

Table 1 : Classification of Consumer-Oriented E-Commerce Applications

Consumer services	Complementary multimedia services
Entertainment	Movies on Demand, video cataloging, interactive ads, multi user games
Financial services	Home banking, financial services, financial news
Essential services	Home shopping, electronic cataloging, telemedicine
Education and training	Interactive education, distance learning
Information	Online databases, directories.

7.2 E-Commerce Organization Applications

Organizations implement technology to save money and improve their profit margins. Organizations do not buy information and communications technology simply because it is new or because it is interesting to the employees.

Following are the various organizational applications of e-commerce:

1. ***Adapting to a Changing Business Environment:*** As there is a rapid change in the business environment, the consumers and businesses are looking for flexibility to change trading partners,

carriers, platforms, and networks. Many firms are considering both internal and external factors of an organization
when shaping their business strategies. The main focus of an organization is to set up private electronic connections with consumer, suppliers, competitors, distributors, and industry groups. This in turn helps to increase the efficiency of business communications, to expand market share, and to maintain long-term position in today's business environment.

2. ***Marketing and E-Commerce:*** Electronic commerce is forcing companies to rethink their existing ways of doing target marketing (isolating and focusing on a segment of the population), relationship marketing (building and sustaining a long-term relationship with existing and potential customers), and even event marketing (setting up a virtual booth where interested people come and visit). Interactive marketing is accomplished in electronic markets via interactive multimedia catalogs.Users find moving images more appealing than still images and listening more appealing than, reading text on a screen.

3. ***Inventory Management and Organizational Applications:*** Inventory management solutions are referred in the manufacturing industry as ***Just-In-Time (JIT)*** inventory systems. In the retail industry, they are referred as quick response programs.

(a) ***JIT Manufacturing:*** JIT purchasing, which is considered as an integral part of JIT, has received considerable attention in electronic commerce. It allows a manufacturer to incorporate its suppliers' efforts towards eliminating waste in the upstream portion of the manufacturing cycle. JIT purchasing focuses on the reduction of inventories throughout the systems of the manufacturing firms and provides a careful audit of the production process. Basically, it optimizes supplier and customer relations.

(b) ***Quick Response (QR) Retailing:*** The process is quite complex, given that a single retailer may purchase merchandise from thousands of vendors in a global market. The failure to stock merchandise that matches customer demand can be extremely costly. To reduce the risk of being out of stock, retailers are implementing QR systems. QR provides for a flexible response to product ordering and lowers costly inventory levels. QR retailing focuses on market responsiveness while maintaining low levels of stocks. It creates a closed loop encompassing the retailer, vendor, and consumer. As consumers make purchases, the vendor automatically orders new deliveries from the retailer through its computer network.

4. ***Supply Chain Management (SCM):*** The SCM process increasingly depends on electronic markets because of global sourcing of products and services. The process helps to reduce costs and product manufacturing life cycles, and provides

flexible manufacturing systems resulting in a variety of customizable products.

5. ***Work Group Collaboration Applications:*** Work group applications of e-commerce enable easy and inexpensive connection of various organizational segments to improve communication and information sharing among employees and to gather and analyze competitive data in real-time. E-Commerce also facilitates sales force automation by enabling salespeople to carry product and reference information in one portable device. Other applications such as, video conferencing, document sharing, and multimedia e-mail, are expected to reduce travel and encourage telecommuting.

6. Electronic Commerce Technology_ Part2

6.1 Introduction

In the previous lecture, we talked about the existence of three types of networks used in e-commerce and explained the first type (internet) in detail. In this lecture we will learn the other two (intranet and extranet).

6.2 Intranet

Internal company network that uses Internet standards (HTML, HTTP & TCP/IP protocols) & software. Accessed only by authorized persons, especially members or employees of the organization. Two levels of security required: internal (Encryption algorithms) and external (Firewall).

6.2.1 Firewall

Security device located between firm's internal network (intranet) & external network (internet). Regulates access into & out of a company's network based on a set of rules. Note : needs to be upgraded from time to time to check latest potential security problems.

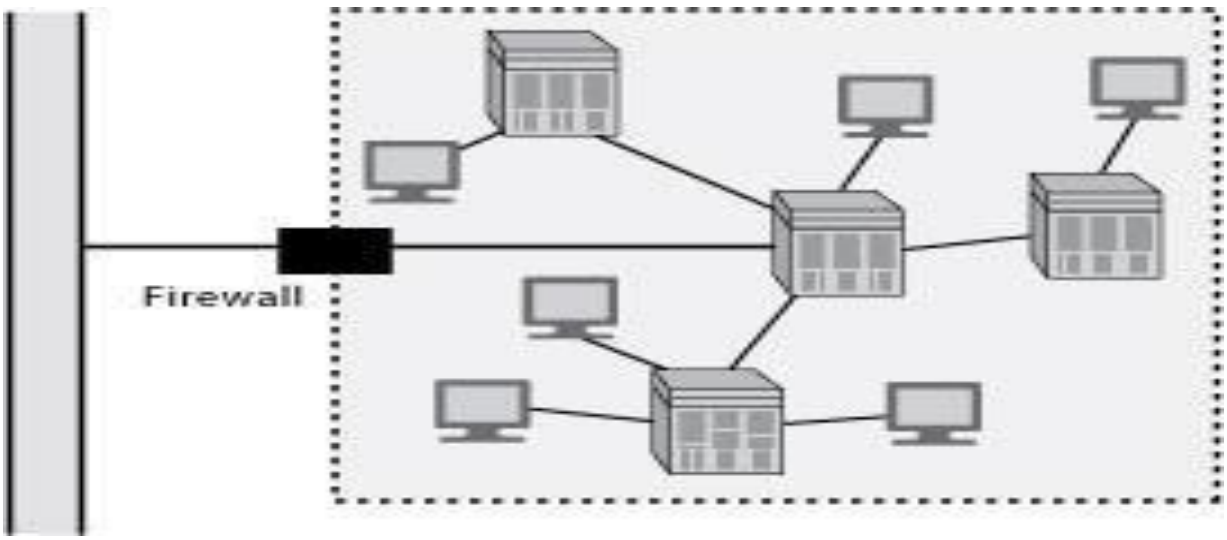


Figure (6.1) intranet

6.2.2 Advantages of Intranet

1. **Workforce productivity**: Intranets can help users to locate and view information faster and use applications relevant to their roles and responsibilities. With the help of a web browser interface, users can access data held in any database the organization wants to make available, anytime and subject to security provisions from anywhere within the company workstations, increasing employees' ability to perform their jobs faster, more accurately, and with confidence that they have the right information.

2. **Time**: Intranets allow organizations to distribute information to employees on an *as-needed* basis; Employees may link to relevant information at their convenience, rather than being distracted indiscriminately by email.

3. **Communication**: Intranets can serve as powerful tools for communication within an organization, vertically strategic initiatives that have a global reach throughout the organization. By providing this information on the intranet, staff have the opportunity to keep up-to-date with the strategic focus of the organization. Some examples of communication would be chat, email, and/or blogs. A great real world example of where an intranet helped a company communicate is when Nestle had a number of food processing plants in Scandinavia. Their central support system had to deal with a number of queries every day.

4. **Web publishing**: allows cumbersome corporate knowledge to be maintained and easily accessed throughout the company using hypermedia and Web technologies. Examples include: employee manuals, benefits documents, company policies, business standards, news feeds, and even training, can be accessed using common Internet standards (Acrobat files, Flash files, CGI applications). Because each business unit can update theonline copy of a document, the most recent version is usually available toemployees using the intranet.

5. **Business operations and management**: Intranets are also being used as a platform for developing and deploying applications to support business operations and decisions across the internetworked enterprise.

6. **Cost-effective**: Users can view information and data via web-browser rather than maintaining physical documents such as

procedure manuals, internal phone list and requisition forms. This can potentially save the business money on

printing, duplicating documents, and the environment as well as document maintenance overhead.

7. **Enhance collaboration**: Information is easily accessible by all authorized users, which enables teamwork.
8. **Cross-platform capability**: Standards-compliant web browsers are available for Windows, Mac, and UNIX.
9. **Built for one audience**: Many companies dictate computer specifications which, in turn, may allow Intranet developers to write applications that only have to work on one browser (no cross-browser compatibility issues).
10. **Promote common corporate culture**: Every user has the ability to view the same information within the Intranet.
11. **Immediate updates**: When dealing with the public in any capacity, laws, specifications, and parameters can change. Intranets make it possible to provide your audience with "live" changes so they are kept up-to-date, which can limit a company's liability.

6.2.3 Disadvantages of Intranet

Management problem	• A company may not have person to update their Intranet on a routine basis • Fear of sharing information and the loss of control • Limited bandwidth for the business
Security problem	• Unauthorized access • Abuse of access • Denial of service

6.3 Extranet

Extranet is an Intranet for outside authorized users using same internet technology. It enables outsiders to work together with company's employees. It also open to selected suppliers, customers & other business partners. For example, Dealers/distributors have access to product files such as (product specification, pictures and etc) to answer the queries of the customer.

6.2.4 Components of Extranet

Some basic infrastructure components such as the internet Including :-

1. TCP/IP protocols,
2. E-mail,
3. Web-browsers,
4. External business partners &
5. Tele-commuting employees place order, check status & send E-mail.

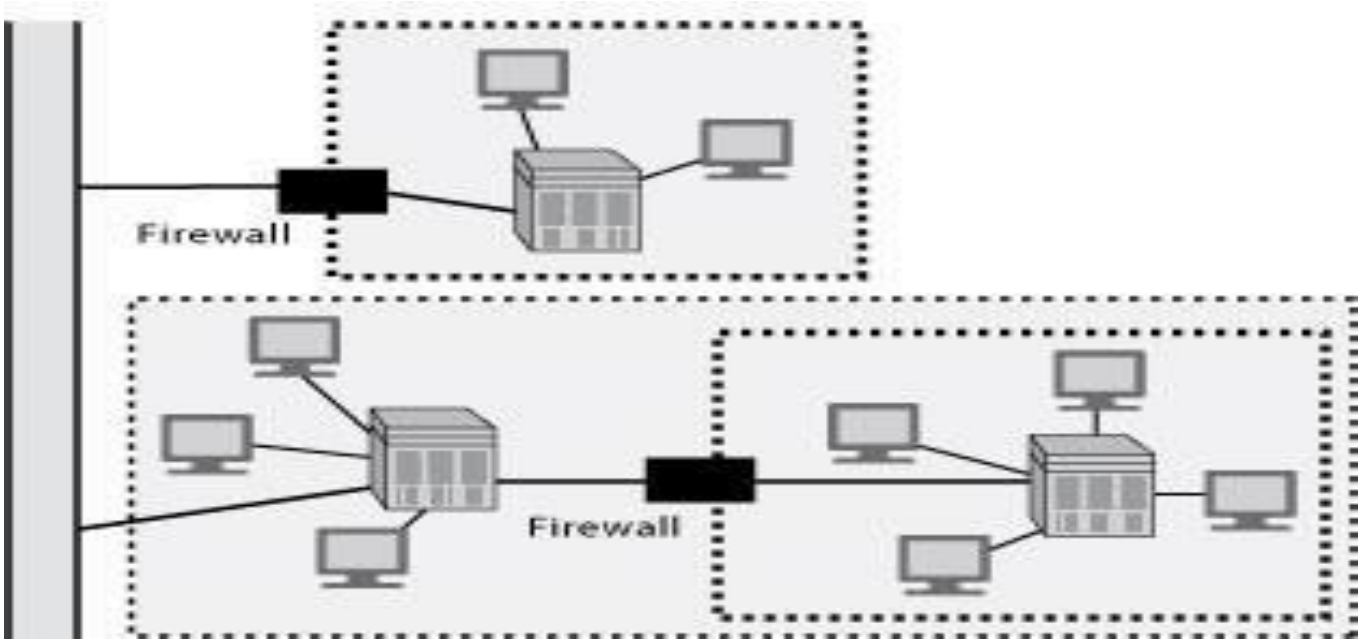


Figure (6.2) extranet

6.2.5 Benefits of Extranet

1. Improved quality.
2. lower travel costs.
3. lower administrative & other overhead costs.
4. reduction in paperwork.
5. delivery of accurate information on time.
6. improved customer service.
7. better communication.

6.2.6 Disadvantages

1. Faceless contact.
2. Information can be misused by other competitors.
3. Fraud may be possible.
4. Technical Employees are required.

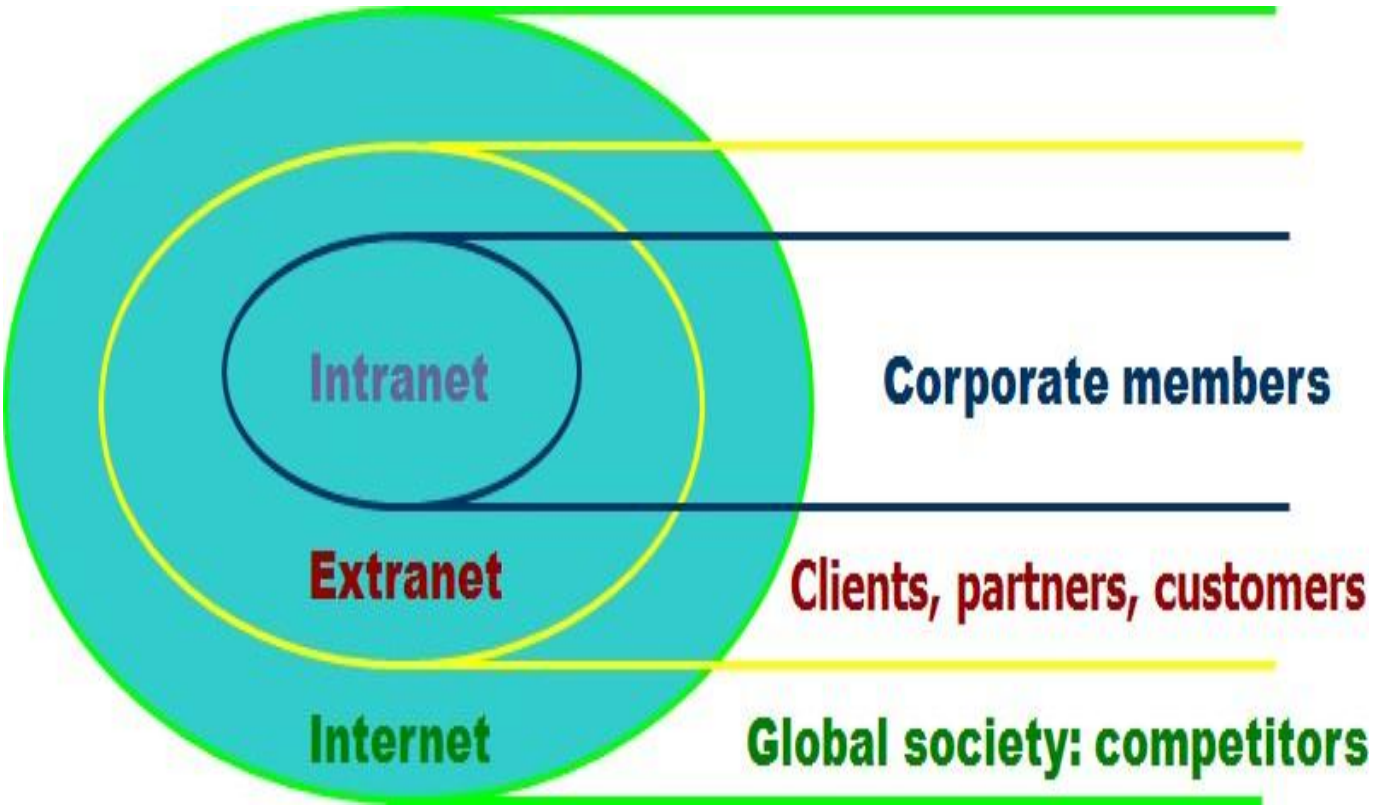


Figure (6.3) internet, intranet and extranet

10. Electronic Data Interchange to E-Commerce

10.1 Introduction

Electronic commerce which is commonly known as e-commerce consists of the buying and selling of products or services over electronic systems such as the Internet and other computer networks. The business is conducted over the Internet using any application that relies on the Internet such as e-mail, instant messaging, shopping carts, Web services, Electronic Data Interchange (EDI), and so on.

EDI is an important subset of e-commerce. It is a system which allows structured transmission of data between businesses, government structures and other entities by electronic means. It is a set of standards, which creates a cohesive system within which all parties are able to electronically exchange information within a set of protocols, with minimal human intervention. Human intervention in the processing of a received message is typically required in error conditions, quality review and for special situations.

Example : The transmission of binary or textual data is not EDI. It requires human intervention to transmit the data unless the data is treated as one or more data elements of an EDI message. In the year 1996, the National Institute of Standards and Technology defined EDI as "the computer-to computer interchange of strictly formatted

messages that represent documents other than monetary instruments."

Example: Consider an interchange of messages between a buyer and a seller. Messages from buyer to seller can include Request For Quotation (RFQ), purchase order, receiving advice, and payment advice. Messages from seller to buyer can include bid in response to RFQ, purchase order acknowledgment, shipping notice, and invoice.

These messages may simply provide information like receiving advice or shipping notice, or they may include data that may be interpreted as a legally binding obligation like bid in response to RFQ or purchase order. The EDI standard was created to facilitate the exchange of business communication between enterprises.

Example: The EDI standards define structures that represent documents such as an invoice or shipping order for a company.

Electronic Data Interchange for Administration Commerce and Transport (EDIFACT) is an international standard for EDI trading in a wide range of commercial and non-commercial sectors. The UN/EDIFACT standards can be used for any application, domestic or international.

10.2 Electronic Data Interchange (EDI) to E-Commerce

E-Commerce is associated virtually in all industrial sectors. For statistical purposes, the U.S. Census Bureau defines

e-commerce as the value of goods and services sold online, whether over open networks like Internet or over proprietary networks running systems like EDI.

E-Commerce payment systems have become very popular majorly due to the widespread use of the Internet-based shopping and banking. EDI is a set of protocols for doing electronic business over computer networks. Initially, these networks were private Value-Added Network (VANs) but EDI is now done over the Internet. EDI supports the electronic exchange of the structured business data like purchase orders, invoices, and shipping notices, between two organizations. The relationship isgenerally between a vendor and a customer.

Example: Using EDI, based on the re-order levels, a customer can place an order for goods using the vendor's computer. The EDI system coordinates transactions, initiates deliveries, and produces invoices.

10.2.1 EDI vs. E-Commerce

It is very important to differentiate between EDI and e-commerce. Let us understand the difference between EDI and e-commerce. E-Commerce encompasses all the aspects of electronic business exchange, including person to person interaction, money transfer, data sharing and exchange, Web site merchant systems, and so on. EDI is a subset of electronic commerce that encompasses the exchange of business

information in a standardized electronic form like layout of information for an invoice or purchase order.

EDI can reduce costs, workforce requirements, and documentation errors related to retyping orders, invoices, and other documents. Using EDI, the computer data already entered by an organization is made available to a business partner.

EDI is typically handled by using store-and-forward technologies which is similar to an e-mail. A third party like General Electric Information Service (GEIS) often serves as a middleman to help organizations establish business relationships and handle business transactions.

10.3 EDI

EDI is an inter-organizational transmission of business documents in a structured format. Many companies use EDI facility to trade with each other. Important messages related to the trade such as purchase orders, delivery instructions, and remittance advice are the typical messages sent between the trading partners. These messages can be effectively communicated between the user companies because they are structured according to various standards.

Earlier, a particular format of agreement between two trading partners was used for electronic interchange of data. But, the differing document formats made it difficult for companies to

exchange data electronically with many trading partners. Therefore, a standard format was necessary to exchange data.

The first attempt to produce a common data format was done in the 1960s by the cooperative effort between industry groups. The format, however, was only for purchasing, finance, and transportation data and it was used only for intra industry transactions. The actual work for national Electronic Data Interchange (EDI) standards began in the late 1970s. The set of standard data format was created by considering both users' and vendors' requirements. The features of the standard data formats are:

1. It is hardware independent.
2. It is unambiguous such that, they can be used by all trading partners.
3. It reduces the labor-intensive tasks of exchanging data.
4. It allows the sender of the data to control the exchange, including acknowledging if and when the receiver received the transaction.

Today, a number of formats are available for EDI. The two most widely recognized and used formats are X12 and EDIFACT.

Some of the essential elements of EDI are the use of an electronic transmission medium rather than using physical storage system such as magnetic tapes and disks. The EDI message is well structured and formatted. EDI enables direct communication between applications and increases the speed of

document transfer from the sender to the receiver. It depends on a sophisticated information technology infrastructure that includes data processing, data management, networking capabilities that provide efficient and reliable data transmission between remote sets.

An EDI message can be easily translated into various formats which are suitable for application software right from controlling the production in a factory to giving future orders to the retailers. The structure permits the trade related operations to be automated with data, from serving customer to the relevant department for automatic action.

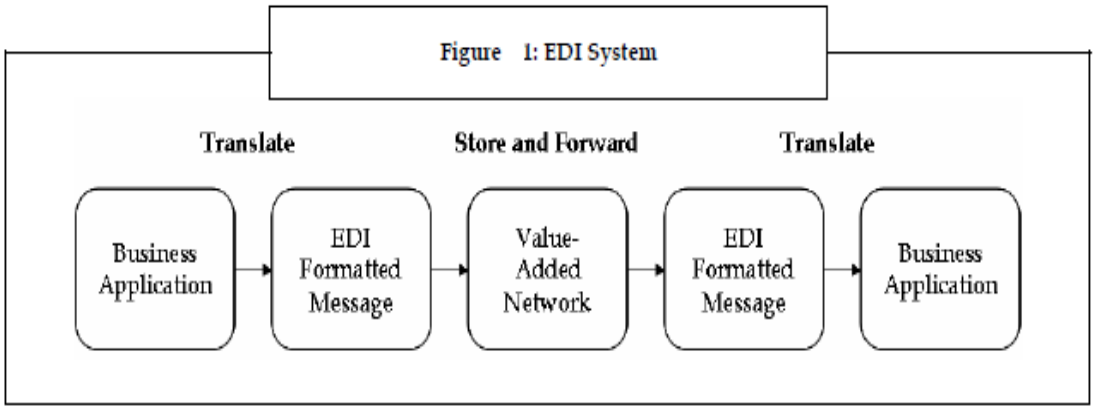
The EDI process is initiated either by downloading a file, or by an operator entering data into a computer with necessary instructions on the screen. The EDI system can send one or more orders at a time and different companies can receive the order at the same time. Once a company sends a message,

it is transferred through a telephone line either to a Value-Added Network (VAN) or directly to the trading partner. VAN stores the received message in an electronic mailbox and simultaneously registers the time and details in a computer. Then, the recipient checks the received message. VAN can also be programed to inform the recipient's computer whenever a new message is received.

The computer which receives the message translates it automatically to the required format. Then, the computer

transmits the message to the computer or applications software of the relevant department. EDI automates the business communications between the trading partners.

Figure.1 shows a typical EDI system.



The speed of creating invoices, purchase orders, receiving tickets, and so on has drastically increased with the advent of computers. Although these documents are produced by high speed printers, there still arises a need to burst, insert, distribute (usually mailed), and file copies of the documents. In traditional systems, the original message had to be manually transported to the receiver, opened, carried to the appropriate individual within the addressee organization and processed, which essentially means manually typing the data into a management information system.

The use of EDI removes many of these problems associated with traditional information flow.

Example: Consider a purchase order between a buyer and a seller. By simply placing the order or entering the information into the buyer's computer, the data can be electronically transmitted to the seller's computer without re-typing the information. This process of data transfer is called application to application EDI.

10.3.1 EDI Communication

Data transfer in a one-to-one EDI relationship can be as easy as connecting a modem and transferring a file. This becomes impractical with more number of vendors. If a manufacturer has to send out hundreds of purchase orders each week to hundreds of suppliers, it would require many employees and a very tight schedule to process their purchase orders. Even if the manufacturer had an extensive private network available for successful transmission, it would be necessary that all vendors be linked with the network.

These problems can be avoided by allowing receivers to access the senders' systems and collect the necessary data. However, the process could have a serious security issue. With careful control this method can be adopted, but it will work only on temporary basis by installing the separate hardware to isolate the system being accessed by third parties. Some companies might accept these approaches, but since the process is complex most EDI users would quickly start preparing printed documents,

depending on the mail to distribute all their documents.

To overcome these issues, EDI users can make use of third-party network services, commonly referred to as "Value Added Networks" or VANs. The VAN works as a clearing house for electronic transactions, serving as a private electronic mail service. A company can send their purchase order files to a single destination. Each vendor's data is routed to their own electronic mailbox by the VAN. If the recipient of the file does not subscribe to the particular VAN used by the sender, then the transaction can be routed from one VAN to the other.

The security issue is resolved by using a VAN. It allows trading partners to trade information and at the same time avoid giving information away. Although both the parties cannot access each other's systems, they can still freely exchange agreed-upon information. The implementation process can be made even easier by using a full service VAN, which provides other services, including translation, standards compliance checking, and EDI software.

10.3.2 Components of EDI System

An EDI system consists of all the components necessary to exchange EDI transactions with the EDI capable trading partners. The following components and tools are necessary for performing EDI:

1. ***EDI Standards***: Different industries have developed their own EDI standards. One must first know the EDI standards that their trading party is using before translating the EDI documents. The EDI standards are designed to be independent of communication and software technology.

The EDI standard provides details about a particular document like, which piece of information is mandatory for that document and which is optional. It also provides the rules for the structure of the document. Two different EDI documents can follow the same standard and contain different sets of information. EDI standards help EDI by:

(a) Providing rules of syntax

(b) Defining the data organization

(c) Providing editing rules and conventions

(d) Making available published public documentation

The four major types of EDI standards are:

(a) UN/EDIFACT standard is the only international standard. This standard is predominant outside of North America.

(b) ANSI ASC×12 standard is predominant in North America.

(c) TRADACOMS standard is predominant in the UK retail industry.

(d) ODETTE standard is used in the European automotive industry.

2. ***EDI Translation Management Software***: EDI transactions are very difficult to read and manipulate. With the help of EDI translation management software, EDI data is translated into a file format which acts as an interface with a company's in-house systems. It also helps to translate the EDI data into the forms that can be used by the users. EDI translation software also supports the development and maintenance of maps. Maps are required to handle each transaction type. Each transaction type with individual partner is formatted differently with the help of a map. It translates the EDI transaction into a useable file format.

3. ***EDI Guides***: EDI trading partners provide EDI guides to communicate about the formatting style of the transaction type. There must be a similarity between the EDI guide and the EDI complaint made with a particular EDI partner. The EDI guides must be similar in order to be compliant with a particular EDI partner. The EDI guides are generally used to develop maps.

4. ***Hardware***: Hardware is needed to run EDI translation software. The computer hardware must be sufficiently powerful and reliable to support the exchange of EDI transactions in compliance with trading partners' transmission schedules all the time.

5. ***Communication Network***: A direct communication link is required to send and receive EDI transactions. Some trading partners offer a direct connection to their EDI computer using a direct AS/2 connection. Trading partners can elect this method

of communication instead of using a third party network provider which is a communications intermediary with other trading partners which is called VAN.

6. ***Inexpensive Microcomputer***: Inexpensive microcomputers are required to bring all potential users into the market. It permits even small firms to implement EDI. Since microcomputers are now easily available, it has become easy for all the firms to deal with each other using EDI maps.

7. ***EDI Experienced Personnel***: EDI experienced personnel are required to implement each of the EDI system components and to maintain the specific data for a company's EDI trading partners.

10.3.3 Advantage of EDI

Replacement of your paper documents with electronic documents has several obvious benefits. Let us take an example of purchase order to understand it more clearly.

Following are the advantages of EDI:

1. ***Reduced Time Delay***: There are principally two reasons for the delay while doing business manually. The first reason is that paper documents may take days to transport from one location to another and the second reason is manual processing delays, which are caused by typing, retrieving files, and comparing data. Manual work can be avoided by using EDI.

2. ***Reduced Labor Costs***: In traditional systems, manual processing is required for typing the data, storing the document, retrieving the data, matching the information, reconciling the data, stamping, signing, and so on. The labor costs for document processing occupies a significant proportion of their overall company's overhead. Labor based processes are more expensive than non-labor-intensive operations which involve computers and telecommunications.

3. ***Error Free***: The non-EDI systems are usually prone to errors as the data is typed multiple times and the documents are easily accessible to people when transported, stored, and retrieved. There is no need for re-entering the data in the EDI system. Thus, it reduces the risk of human error.

4. ***Removes Uncertainty***: In non-EDI processing systems, time delays and uncertainties lead to storage of large amount of documents and paper works. Inventories are often higher than necessary. In a manufacturing firm, it is virtually impossible to do a just-in-time inventory system with the time delays inherent in non-EDI processing systems.

5. ***Reduced Inventories***: In non EDI processing systems, uncertainties and time delays lead to accumulation of large amount of documents and paper work. EDI can help organizations directly or indirectly to improve their inventory control. It helps in reducing the inventory costs through shorter

order processing and delivery cycles and by lower inventory levels.

6. ***Information Access:*** EDI allows users to access a vast amount of detailed transaction data. Since EDI data is already stored in computer-retrievable form, it is subjected to automated processing and analysis.

10.3.4 EDI Transmission

Companies have various ways to send and receive the EDI files through the Internet. The EDI transmission utilizes various software and systems to allow transmission, where more than one document can be transmitted at a time. Let us take an example to understand the working of EDI transmission.

Some of the ways of EDI transmission are described below.

1. ***Dial Up:*** In this method, communications generally happen over dedicated lines directly between trading partners or through VAN. This file transmission method uses a computer's modem to send tax return, report and/or payment files to the department's EDI service provider. However, this transmission is very slow and also very expensive, due to the use of several modems and lines to support multiple trading partners. Taxpayers who do not have Internet access on their computer generally use this transmission method. Dial-up transmission was mainly used to send and receive the EDI files before the high-speed Internet became popular.

Note : The Framework EDI component has no dial-up functionalities.

2. ***Simple Mail Transfer Protocol (SMTP) or E-mail:*** According to Bruce Chambers, "There is a significant amount of E-mail activity around an EDI transmission." E-mail over the Internet provides less expensive and simple ways of sending and receiving EDI files. However, the security is less if the files are sent by e-mail over the Internet, and also the size of an account's mailbox limits the size of EDI files that one can send. In addition, as per EDI definition, human intervention is not required to transfer a document, whereas, e-mail generally requires a user to retrieve an attached message.

3. ***File Transfer Protocol (FTP)***: FTP has become one of the popular ways of sending and receiving files. Trading partners can easily create their own FTP server and directly upload their EDI files.

However, with this protocol, files can only be sent or received into directories where these files wait to get polled for processing. These files can be processed depending on the polling interval. This operation is used to send appropriately packaged EDI, Extensible Markup Language (XML), or other business data.

4. ***Hypertext Transfer Protocol (HTTP) or Hypertext Transfer Protocol Secure (HTTPS):*** HTTP server is the most commonly available of all communication servers. Just like FTP, HTTP server is inexpensive but the major advantage of the HTTP server is that, the HTTP protocol directly sends to or receives files from a destination application. Because of this direct process, it is possible to have the destination application run a process immediately once a file is received. This process is used to acknowledge the received files.

Note : HTTP is the foundation of data communication for the WWW.

5. ***EDIINT AS2***: It is sophisticated and a more complicated version of HTTP. It is an Internet based communication protocol which allows sending business data such as purchase orders, invoices, and delivery notes over the Internet regardless of the data format EDI or XML. Since, the transmission of business data using VAN is very costly and the pricing model is very confusing, a company can reduce their ongoing expenses with VANs by utilizing the AS2 solution in the B2B strategy.

3. E-Payment Systems

3.1 Introduction

Various applications of e-commerce are continually affecting trends and prospects for business over the Internet, including e-banking, e-tailing and online publishing/online retailing. A more developed and mature e-banking environment plays an important role in e-commerce by encouraging a shift from traditional modes of payment (i.e., cash, checks or any form of paper-based legal tender) to electronic alternatives (such as e-payment systems).

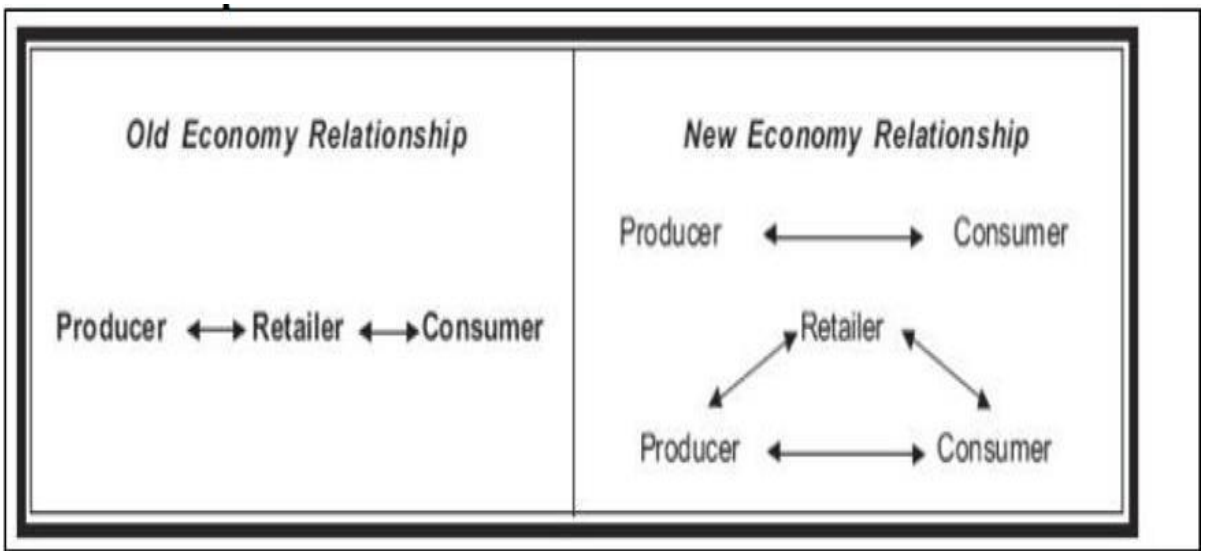


Figure (3.1) Old Economy Relationships vs. New Economy Relationships

3.2 online payment schemes

3.2.1 Traditional Payment Methods

Cash-on-delivery. Many online transactions only involve submitting purchase orders online. Payment is by cash upon

the delivery of the physicalgoods.

Bank payments. After ordering goods online, payment is made by depositing cash into the bank account of the company from which the goods were ordered. Delivery is likewise done the conventional way.

3.2.2 Electronic Payment Methods

- **Innovations affecting consumers,** include credit and debit cards, automated teller machines (ATMs), stored value cards, and e-banking.
- **Innovations enabling online commerce** are e-cash, e-checks, smart cards, and encrypted credit cards. These payment methods are not too popular in developing countries. They are employed by a few large companies in specific secured channels on a transaction basis.
- **Innovations affecting companies** pertain to payment mechanisms that banks provide their clients, including inter-bank transfers through automated clearing houses allowing payment by direct deposit.

3.3 Types of Electronic Payment Systems

Electronic payment systems are common in banking, retail, health care, on- line markets, and even government in fact, anywhere money needs to change hands. The organizations are motivated by the need to deliver products and services more cost effectively and to provide a higher quality of service to customers. The emerging electronic payment technology labeled electronic funds transfer (EFT). EFT is defined as ―any transfer of funds initiated through an electronic terminal telephonic instrument, or computer or magnetic tape so as to order, instruct, or authorize a financial institution. EFT can be segmented into three broad categories:

1- **Banking and financial payments**

- Large-scale or wholesale payments (e.g., bank-to-bank transfer).
- Small-scale or retail payments (e.g., automated teller machines).
- Home banking (e.g., bill payment).

2- **Retailing payments**

- Credit Cards (e.g., VISA or MasterCard).
- Private label credit/debit cards.
- Charge Cards (e.g., American Express).

3- On-line electronic commerce payments a-Token-based payment systems

- Electronic cash (e.g., DigiCash).
- Electronic checks (e.g., NetCheque).
- Smart cards or debit cards (e.g., Mondex Electronic CurrencyCard).

b- Credit card-based payments systems

- Encrypted Credit Cards (e.g., World Wide Web form-basedencryption).
- Third-party authorization numbers.

3.4 E-Cash

Electronic cash is a general term that describes the attempts of several companies to create value storage and exchange system that operates online in much the same way that government-issued currency operates in the physical world. However, Concerns about electronic payment methods include:

– Privacy.

– Security.

– Independence.

– Portability.

There are many ways that exist for implementing an e-cash system, all must incorporate a few common features. Electronic

Cash is based on cryptographic systems called "digital signatures". This method involves a pair of numeric keys: one for locking (encoding) and the other for unlocking(decoding). E-cash must have the following four properties:

1- Monetary value.

2- Interoperability.

3- Retrievability.

4- Security.

3.4.1Electronic Cash Storage

There are two methods of electronic cash storage including:1- **On-line**

- Individual does not have possession personally of electronic cash.
- Trusted third party, e.g. e-banking, bank holds customers' cashaccounts.

2- Off-line

- Customer holds cash on smart card or electronic wallet.
- Fraud and double spending require tamper-proof encryption.

The purchase of e-cash from an on-line currency server (or bank) involvestwo steps:

1- Establishment of an account.

2- Maintaining enough money in the account to bank the

purchase.

Once the tokens are purchased, the e-cash software on the customer‘s PC stores digital money undersigned by a bank. The users can spend thedigital money at any shop accepting e-cash, without having to open an account there or having to transmit credit card numbers. As soon as the customer wants to make a payment, the software collects the necessary amount from the stored tokens Convenience.

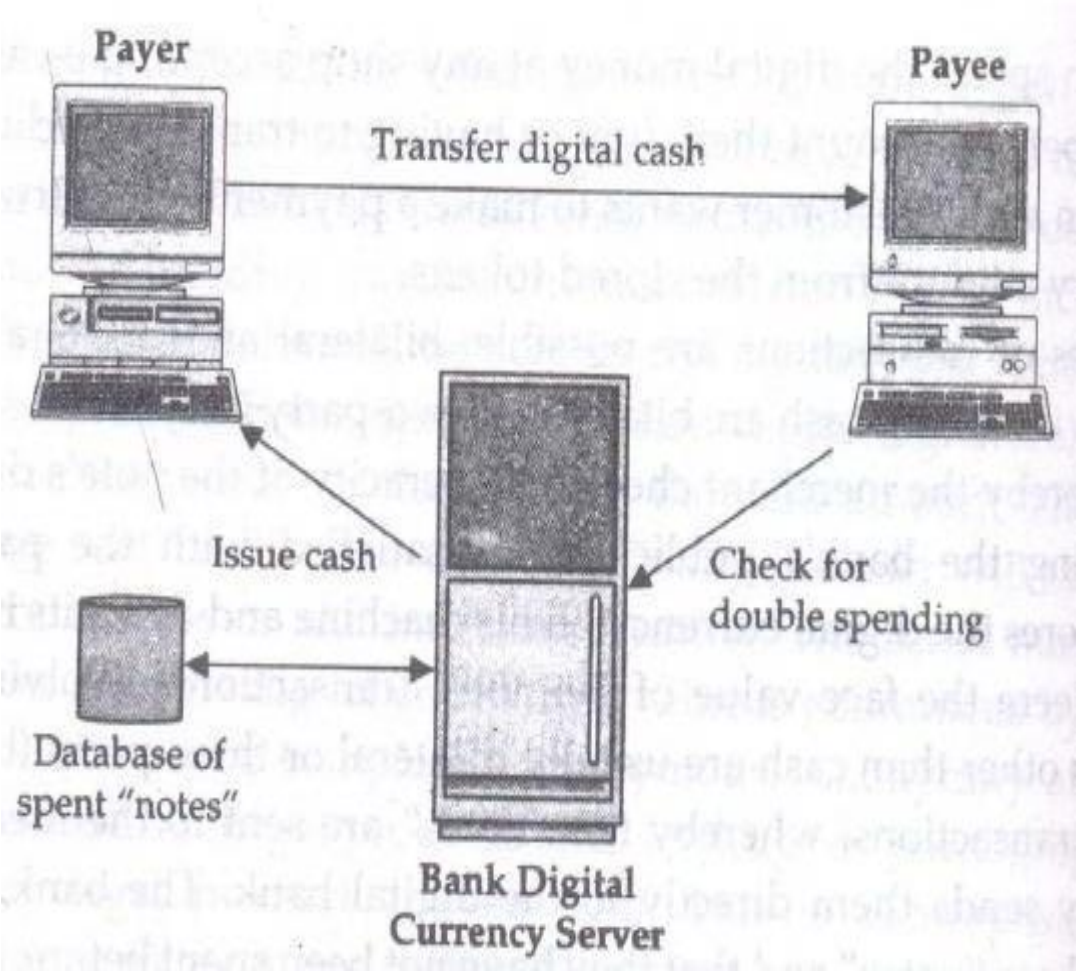


Figure (3.2) E-Cash System

3.5 Electronic Checks

It is another form of electronic tokens. Buyers must register with third-party account server before they are able to write electronic checks. The accountserver acts as a billing service.

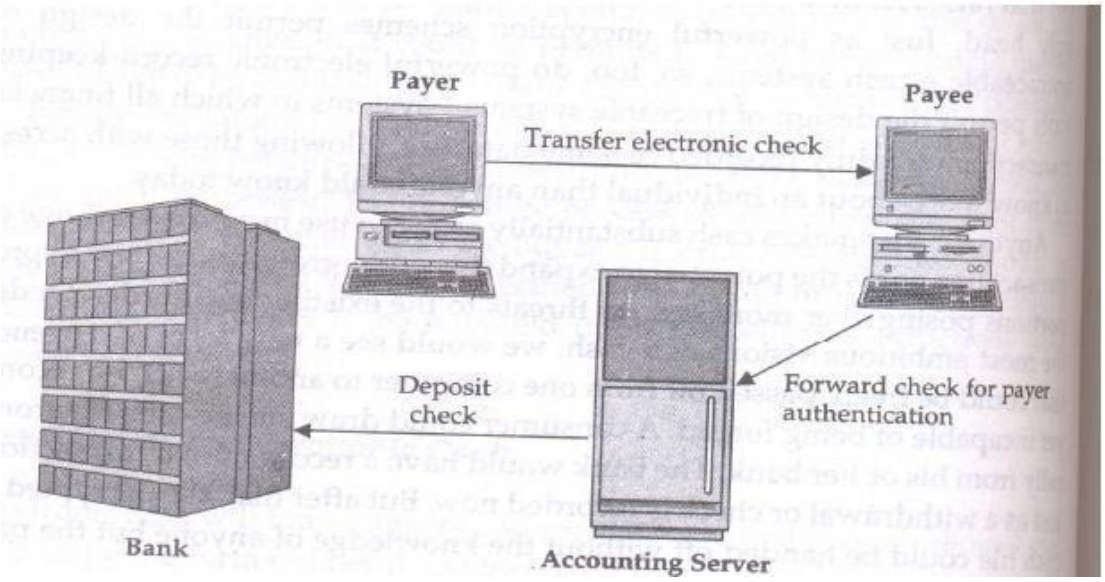


Figure (3.3) E-Checks System

3.6 Smart Cards & Electronic Payment Systems

Smart cards have been in existence since the early 1980s and hold promisefor secure transactions using existing infrastructure. Smart cards are credit and debit cards and other card products enhanced with microprocessors capable of holding more information than the traditional magnetic stripe. The smart card technology is widely used in countries such as France, Germany, Japan, and Singapore to pay for public phone calls, transportation, and shopper loyalty programs.

Advantages:-

- Payment cards provide fraud protection.
- They have worldwide acceptance.
- They are good for online transactions.

Disadvantages:-

- Payment card service companies charge merchants per-transactionfees and monthly processing fees.

13. Management of Change

13.1 Introduction

We live in the age of constant change. We have a tendency to associate the idea of change with that of progress. Today, teams and organizations are facing rapid changes like never before. Globalization has amplified the markets and opportunities for extra growth and revenue. Progressively, diverse markets have a broad variety of needs and expectations that must be understood if they are to become strong customers and collaborators. The capability to manage change while continuing to meet the needs of customers, is a very essential skill required by today's leaders and managers. According to John Kotter (1996), “Most credible evidence suggests that change will happen at a more rapid pace in the business environment in the future. The rate of environmental movement and the pressure on organizations to transform themselves will increase over the next few decades. If this is the case, then the only rational solution is to learn more about what creates successful change.” As the speed of change is continuing to increase, change management has become a fundamental skill needed by managers, human resources staff, and organization leaders. Change management is a structured approach of shifting individuals, teams and organizations from an existing state to a desired future state. It is an organizational process targeted to

empower employees to accept changes and implement the changes in their present business environment.

13.2 Overview of Change Management

According to Albert Einstein, "The world we have created is a product of our thinking and it cannot be changed without changing our thinking." The main target of change management is to assess and plan the change process to make sure that if a change is made, it is completed in the most proficient way. A general definition used for change management is a set of processes that is employed to guarantee that significant changes are implemented in a logical, controlled, and efficient manner to effect organizational change.

Example: The set of processes include recording of changes, evaluating the impact, cost, benefit, and risk of planned changes, developing business validation, and obtaining approval.

Some of the other activities under change management program are managing and coordinating change realization, monitoring and reporting on implementation, reviewing and closing change requests.

Organizational change management takes into account the processes and tools that managers use to formulate changes at an organizational level. Most organizations desire change to be implemented with the slightest resistance possible and for this to happen, change must be applied with a structured approach.

Change management must work to make sure that the changes are:

1. Justified.
2. Carried out without risking service quality.
3. Appropriately recorded, classified, and documented.
4. Diligently tested in a test environment.
5. Functioning with backup plans and if the system functions inaccurately after implementation, then the changes can be undone.

Before initializing organizational change, we need to make sure what we want to achieve with the change and how will we know that the change has been achieved. We also need to make sure who is affected by this change, along with their probable reactions to the same. These aspects relate strongly to the management of personal as well as organizational change.

13.2.1 Strategies of Change Management

There is no specific change management strategy model for each and every organization. Each organization develops its own model of change management, often by selecting a model and modifying it as they go along in developing their own planning process. The basic strategies provide a range of alternatives from which organizations select an approach and begin to develop their own change management process.

An organization may prefer using a scenario to identify strategic issues and goals, and then carefully plan to address the issues and reach the goals.

Types of change management strategies include:

1. ***Directive Strategies:*** This approach emphasizes on the manager's right and authority to manage and enforce change without involving other people. The main advantage of the directive strategy is that change can be brought into effect quickly. This approach however does not take into account the views of other people who are involved in, or are affected by the imposed change. Valuable information and ideas may be missed in this approach as the inflow of new ideas or information is restricted due to non-participation of other people. There is generally a strong aversion from the staff of an organization, when changes are forced on them rather than discussed and agreed.


Example: When a manager wants to shuffle the domain of the employees working in a project, he or she takes the decision and conveys the change to the higher authorities.

2. ***Expert Strategies:*** This approach takes into account change management as a problem solving process, which involves an expert. The expert approach is primarily applied to problems that are more technical and are normally led by a specialist

project team or senior manager. In this scenario, there is little involvement with those affected by the change.

Example: When a new learning management system is introduced in an organization, an expert leads the team to build and initiate the system.

The advantage of using this strategy is that experts play a key role in finding a solution to a problem. The implementation of the solution is quick as a small number of experts are involved.

However, those affected by the change may have different views than those of the experts and may not welcome the solution being imposed or the outcomes of the changes made.

3. ***Negotiating Strategies:*** This approach emphasizes on the willingness of the senior managers to negotiate and bargain in order to achieve change. Senior managers must also believe that adjustments and concessions may need to be made in order to realize change.

This approach recognizes that those affected by change have a right to say about the implemented change. Individuals feel involved in the change and are supportive of the changes made. This approach takes more time to effect change, which is one of the disadvantages of this strategy. The outcomes of this approach cannot be predicted and the changes made may not accomplish the total expectations of the managers.

Example: Suppose an automobile company decides to upgrade its database to be more competent in the growing market. For

this they need to hire an IT company who will provide the required software. The software and its annual maintenance will cost the buyer a lot of money. The senior managers negotiate to reduce the price of the software. If the negotiation is successful, the software will be bought at the price fixed by the senior managers of the automobile company.

4. ***Educative Strategies:*** This approach involves changing people's values and beliefs, which motivates them to support the changes and move toward the development of a shared set of organizational values. Activities like education, training, and selection are used which are led by specialists and in-house experts. Individuals within the organization have optimistic commitment to the changes. The disadvantage of this approach is that it takes a longer time to implement.

5. ***Participative Strategies:*** This approach emphasizes on the full participation of all of those involved and affected by the changes. Though senior managers drive this approach, the process is equally driven by the management, groups or individuals within the organization. The views of all the individuals involved are taken into consideration before changes are made. Consultants and experts from outside the organization are used to aid the process but they do not make any decisions regarding the outcomes. The main disadvantages of this process are that the process is lengthy and the outcomes may be unpredictable.

This approach is also more expensive due to the numerous meetings of consultants and experts who are paid for their services. However, the benefit of this approach is that the changes made are more likely to be supported due to the involvement of all those who are affected.

13.2.2 Challenges of Change Management

Change management faces various challenges. Some challenges are internal whereas some are external.

Now, we will discuss the challenges.

Challenges of Initiating

These challenges are often sufficient to thwart any growth almost before it starts. They are encountered at the early stages of major organizational change. The ability to deal with the challenges must be created under high pressure. However, to manage these challenges efficiently, organizations must develop competencies much earlier instead of dealing with them in the future. The following are the challenges of initiating:

1. ***Not Enough Time:*** This is the challenge of control over one's time. It represents an important prospect for restructuring the way that work places are organized and to provide flexibility and time for expression and innovation.

2. ***Lack of Help:*** Some managers consider asking for help, a mark of incompetence, while others are unaware that they need coaching and support. Meeting this challenge means developing

the capabilities for identifying the need for help, recognizing the appropriate help, and the desire to guide each other in developing successful innovations.

3. ***Not Relevant:*** The main concern for pilot groups is to get a convincing case for learning and change. If people are not totally committed to an initiative's goals, a commitment gap develops and this hinders them to take part enthusiastically in achieving the goal. Creating relevance depends on open conversations regarding the reasons for change and the expected commitments of the people involved.

4. ***Lack of Leadership Values:*** It effects a change when there is a mismatch between the conveyed message and the actual behavior. If executives and leaders are not able to provide an atmosphere of trust and authenticity, then genuine change cannot occur or move forward. Leaders and managers must be sincere and open.

13.2.3 Guidelines for Change Management

The change management process should include the following elements:

1. ***Change Initiation:*** A Request For Change (RFC) should be filed and recorded. The request includes the proposed change, change category, and any other additional and supporting details.

The resources necessary to successfully plan, develop, test, and implement the proposed change allot a standard, minor, significant, or major change category.

 *Example:* When a need for change has been recognized and the initiator has raised a Request For Change (RFC), the change is categorized and prioritized based on the initial information available.

2. ***Change Review:*** The change manager reviews the RFC to conclude the impact of the requested change and accredit priority to the RFC as urgent, high, medium, or low priority. The change manager makes sure that the RFC is complete and practical. During the course of change review, existing information on identified risks and their potential impacts from risk management is used to process the RFC. When there is inadequate information to conclude the potential impact of the RFC on the exchange service, the risk management process takes place. Findings are documented as part of the risk list and risk statement.

 *Example:* After the RFC is ready, the authorization process takes place. If the change is authorized, it continues into the approval process. If authorization is denied, it is returned to the change initiator for additional information and rework before it is resubmitted.

3. ***Change Approval and Scheduling:*** An acceptably completed RFC with an appropriately identified category and priority

requires approval from the decision maker or the Change Advisory Board (CAB). The CAB is a group of stakeholders representing different business entities and interests. If the change is accepted and approved, the CAB sets a first round schedule for implementing the requested change. All relevant approval or reject discussions and scheduling decisions are entered into the change management log.

Example: The CAB appoints a team to validate the test plan as part of the change management process. The team tests all items in a test lab, analyzes, verifies the results, and prepares a report for the CAB.

4. ***Planning, Developing, Testing, and Implementing:*** Once the change is approved, scheduled, and documented, the RFC goes to the change owner, who is accountable for implementing the requested change. As a part of configuration management, all data regarding planning, developing, testing, and implementing the change is entered into the log.

Example: The change owner is the person who plans and implements the change. The change owner tests whether the implemented change actually works and satisfies the change request.

5. ***Change Verification and Process Review:*** The change requester and change manager authenticate whether the change owner has effectively implemented the changes. The success or

failure and the efficiency of the change process are documented, so that counteractive actions can be taken to pick up future changes.

13.2.4 Change Management in Public Administration

Governments always face a growing complexity and need more specialized staff to manage and solve new problems. Traditional administration, governed by a set of specific legislation is not sufficient for this purpose. Each organization has a specific culture depending on which, certain changes are made. Restructuring and reengineering of the government has become a necessity to alter its image and make it friendlier to the people. Its performance and presentation has to be enhanced through innovative and cost effective processes based on IT, EDI or e-commerce in particular.

Changes in legislation, social or political climate change, competition, economy, and so on. Change management refers to the adoption and implementation of change in a planned, structured, and organized way. The government is responsible for the change management in public administration.

They follow a structured and organized process that helps in the transition from one stage to another.

The aim is to implement more effective methods and systems in an organization that can function efficiently. However, few changes are found to be managed within the organization and

are controlled by it. In many cases, the process of change is treated independently from the characteristics of a situation. It is extensively recognized that these processes of change management must be performed by agents of change.

12. Cyber Security and Crime

12.1 Introduction

The Internet has grown rapidly with advancements in computer and telecommunication technologies. Internet commerce tools are used in the fields of education, communication, work, trade, health, interaction, and commerce. The growth of Internet has provided an opportunity for people to improve the quality of their lives which has led to the betterment of society.

However, Internet commerce tools are also used for fraudulent activities. This is because Internet systems are vulnerable targets for attack. Systems that are not configured securely or not protected from known vulnerabilities are easy victims to cyber-attacks. Cyber criminals attack computer networks, advocate violence, promote hatred, and vandalism using the Internet. Internet based applications such as electronic banking and e-commerce are potential targets for computer criminals. Criminals can conduct their operations from any corner of the world and can access any computer network. Hence, cyber security is essential to protect us from cybercrimes.

12.2 Cyber Security

Individuals and groups engage in crime by utilizing the tools provided by Internet for the benefit of people. It is extremely difficult to trace the criminals, and even when they are traced it is difficult to prosecute the culprits due to lack of laws. The governments are gradually trying to regulate the Internet through cyber laws. Law enforcement agencies are given the power to intercept online communications to curb cybercrime.

Example: The Regulation of Investigatory Powers Act in Britain gives law enforcement agencies the power to intercept online communications. South Korea has blocked access to gambling sites and Singapore has blocked access to pornography sites.

12.2.1 Cyber Attacks

A cyber threat is an intended or unintended illegal activity that could lead to unpredictable, unintended, and adverse consequences on a cyberspace resource. Cyber-attacks are classified as network based and executable based attacks. Executable based attack happens when a program is executed on a target computer system through either of the following ways:

1. ***Trojan:*** Trojan is a computer program with hidden and potentially malicious functions that evade security mechanisms.

They exploit authorizations of a system entity that invokes the program. Trojans pretend to do one thing while actually they do something different. Modifying a normal program to perform fraudulent activities in addition to its usual function is known as a Trojan horse attack. An attacker accesses the source code of an editor program, modifies it to steal someone's files, compiles it and saves it in the victim's computer. The next time the victim executes the editor program, the intruder's version gets executed. The editor apart from performing its normal functions transmits the victim's files to the attacker.

2. ***Virus:*** Virus attaches itself to a legitimate program with the intention of infecting other files. A virus cannot run by itself. It requires a host program to get executed and to make it active. It is hidden by nature and propagates by infecting a copy of itself into another program. A virus writer first produces a new useful program, often a game, which contains the virus code hidden in it. The game is then distributed to unsuspecting victims through the available networks. When the victim starts the game program, it examines all the binary programs on the hard disk to see if they area already infected. When an un-infected program is found, the virus program infects it by attaching the virus code to the end of the file and makes the first instruction jump to the virus code. In addition to infecting other programs a virus can also erase and modify files.

3. ***Worm:*** Worm is a computer program that runs independently and can propagate a complete working version of itself onto other hosts on a network. Virus is part of a program. Whereas, a worm is a complete program in itself. Both viruses and worms try to spread themselves and can cause enormous damage. An attacker uses bugs in the operating system or in an application to gain unauthorized access to machines on the Internet. Then a self-replicating program is written which exploits the errors and replicates itself within seconds on every machine it could gain access to.

Example: Explore Zip worm deletes files on a host system.

4. ***Spam***: Spam is a major source of cyber-attack. It is used to propagate viruses and worms. It appears to be promotional material and is similar to advertisements and catalogs. Unsuspecting users become victims when they click on attachments the spyware and Trojans get installed on their systems. Information and data on all activities of interest thus gets reported from users' computers to sites whose forwarding addresses have been installed as part of spyware. This information may be used by competitors.

In order to protect the information present on computers and servers a proper antivirus must be installed and updated regularly.

12.3 Methods of Attacks

The most popular weapon in cyber terrorism is the use of computer viruses and worms. The attacks on the computer infrastructure can be classified into three different categories:

1. ***Physical Attack***: In this type, the computer infrastructure is damaged by using conventional methods like bombs, fire, and so on.
2. ***Syntactic Attack***: In this type of attack, computer viruses and Trojans are used to modify the logic of the system in order to introduce delay or make the system unpredictable.
3. ***Semantic Attack***: In this type of attack, the information keyed in the system during entering and exiting the system is modified without the user's knowledge in order to induce errors.

Note: The use of computers, Internet, and information gateways to support the traditional forms of terrorism like suicide bombings is also a form of cyber terrorism. Most common usage of the Internet is designing and uploading Web sites through which false information is propagated. This can be considered as using technology for psychological warfare.

 **Did you know?** Attackers use JavaScript, Perl, PHP, and many other scripts to redirect the user to a site that is similar in appearance to the original Web site. The script requests the user to enter authentication information, credit card number or social security number and from the entered information the attacker can steal the user's money.

12.4 Cybercrime

Cybercrime is the latest and perhaps the most complicated threat in the cyber world. Any criminal activity that uses a computer either as an instrument or target is classified as cybercrime. The computer may be used as a tool in the following activities - pornography, sale of illegal articles, online gambling, property crime, financial crimes, e-mail spoofing, and cyber stalking. The computer can however be the target in the following activities - salami attacks, data diddling, logic bomb, physically damaging thecomputer system, theft of computer system, and so on.

12.4.1 Types of Cybercrimes

Cybercrime may be broadly classified under the following three groups:

1. Against individuals
2. Against organization
3. Against society at large

1. ***Against Individuals:*** The following crimes can be committed against individuals:

(a) E-mail spoofing

(b) Harassment via e-mails

(c) Cyber-stalking

(d) Dissemination of obscene material

(e) Indecent exposure

(f) Cheating and fraud

(g) Defamation

The following crimes can be committed against the property of individuals:

(a) Transmitting virus

(b) Computer vandalism

(c) Unauthorized access over computer system

(d) Internet time thefts

(e) Intellectual property crimes

2. ***Against Organization:*** The following crimes can be committed against organizations:

(a) Possession of unauthorized information

(b) Cyber terrorism against government organizations

(c) Distribution of pirated software

(d) Unauthorized access over computer system

3. ***Against Society:*** The following crimes can be committed against society at large:

(a) Financial crimes

(b) Pornography

(c) Trafficking

(d) Online gambling

(e) Forgery

Here some of the crimes are discussed briefly:

1. ***Denial of Service:*** These attacks are aimed at denying access to authorized persons to a computer or a computer network. These attacks can be launched with the use of a single computer or multiple computers across the world. The victim's computer is flooded with more requests than it can handle which causes it to crash. Distributed Denial of Service (DDoS) attack is also a type of denial of service attack in which the offenders are wide in number and widespread.

2. ***IP Spoofing:*** IP spoofing is used by intruders to gain unauthorized access to computers. Messages are sent to the computer with the sender's IP address of a trusted system by modifying the packet headers.

3. ***Hacking:*** Externally accessible systems are hacking targets. Hackers can spoil Web sites and steal valuable data from systems resulting in a significant loss of revenue. Hackers often hide the identity of computers that are used to carry out an attack by falsifying the source address of the network communication. This makes it more difficult to identify the

sources of attack and sometimes shifts attention to innocent third parties.

4. ***Cyber Stalking***: It involves the following:

(a) Following a person's movements over the Internet by posting threatening messages on the bulletin boards frequently visited by the victim.

(b) Entering the chat-rooms frequently visited by the victim.

(c) Bombarding the victim with e-mails constantly.

5. ***Data Diddling***: Data diddling involves modifying raw data just prior to the computer processing.

The data is then changed to its original form after the processing is completed.

6. ***E-mail Bombing***: E-mail bombing involves sending a large number of e-mails to the victim which crashes the e-mail account or mail servers.

7. ***Salami Attack***: These attacks are used for the commission of financial crimes. An important feature of this type of attack is that the alteration is so small that it normally is not noticed.

8. ***Internet Time Theft***: In these kinds of thefts the Internet browsing hours of the victim are used up by another person.

9. ***Logic Bomb***: These programs are created to do something only when a certain event occurs.

10. ***Intellectual Property Crime:*** Intellectual property crime is generally known as piracy or

counterfeiting. Piracy involves willful copyright infringement. Whereas, counterfeiting is willful trade mark infringement.

12.4.2 Reporting a Cybercrime

Crime in a society will remain at a tolerable level if it is detected early and the criminals are identified and awarded appropriate punishment. This will dissuade other individuals from indulging in such acts in the future. An unreported crime encourages the criminal to commit further such acts, apart from taking away the deterrence for others. Proper reporting helps the policy makers to know about the trends and allocate the resources to adequately tackle newer crimes.

Individuals do not report crime as they are concerned about the loss of reputation or negative publicity. However, most law enforcement agencies are aware of this and take steps to keep crime details confidential.

The following details must be provided by the complainant while addressing a complaint to the head ofcybercrime investigation cell:

1. Name of the complainant.
2. Mailing address and telephone number of the complainant.
3. Details on how the offence was committed, along with names and addresses of suspects, and any other relevant information.

The content of the application varies with the type of

fraud faced by the victim. The following details must be provided by the complainant for the respective fraud faced:

Cyber Stalking

Cyber stalking is the most common type of crime and the victim's report should contain the following:

1. E-mails or messages received.
2. Phone numbers of any obscene callers.
3. Web site address which contains the victim's profile.
4. Screen shot of the Web page has to be saved and a hard copy must be submitted.
5. Any other relevant information could be provided after consulting law enforcement agency.

Password Hacking

The following details must be provided in case of password hacking:

1. Details of last access of the e-mail account.
2. Details of the computer used for browsing.
3. Any information related to e-mail account such as date of birth entered, pin code entered, security question, and last password.

12.4.3 Preventing a Cybercrime

Governments should engage academic institutions to educate the common man about the dangers of cyber terrorism. There has to be a joint effort by all Government agencies including defense forces to attract qualified skilled personnel to implement counter measures. There is a growing connection between the hacker and the terrorist. Very soon terrorists themselves will become excellent hackers. A common vision is required to ensure cyber security and prevent cybercrimes. The following measures must be taken to prevent cybercrime:

1. Avoid disclosing any personal information.
2. Avoid sending any photograph online to strangers.
3. Use latest and updated antivirus software.
4. Never send credit card number to any site that is not secure.
5. Use a firewall.