

E-COMMERCE APPLICATIONS

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Strategic implications of IT – Business capability – Strategy formulation and implementation Planning – e-commerce implementation – e-commerce evaluation. Case Studies: Airline booking systems – Web Booking Systems - Competitive outcomes.

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UNIT I

LESSON

1

INTRODUCTION TO E-COMMERCE

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- 1.0 Aims and Objectives
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1.0 AIMS AND OBJECTIVES

After studying this lesson, you will be able to:

- Explain the scope of e-commerce
- Discuss the definition of e-commerce
- Describe the internet commerce
- Identify and explain the electronic markets
- Discuss electronic data exchange

1.1 INTRODUCTION

Electronic commerce is a generic name for a range of technologies that allows the transfer of business information using electronic means. It is popularized by the advent of commercial services of the Internet. The commercial use of internet is perhaps typified by once-off sale to consumers.

Companies are re-orienting themselves in the present competitive era. Globalization of markets is taking place with formation of trade blocks across the globe, and world moving towards a global village. Technology is setting the pace for how a company does business, how it launches new

products and enters into a new market, how it deals with suppliers, and how it communicates with customers and others in the new marketplace. In this lesson, we will study the basic of e-commerce.

1.2 E-COMMERCE

e-commerce is a selling and transfer process requiring several institutes. It is systematic and organized network for the exchange of goods between produces and consumers. The Net aims to establish the interconnections between producers and consumers directly and in this, the Internet embraces all those related activities which are indispensable for maintaining a continuous, free and uninterrupted distribution and transfer of goods. The Website or portals may be categorized into commercial and non-commercial.

Any website or portal that offers products and/or services for sale is a commercial website. There are thousands of commercial websites on the Internet. Some of them have been successful, and some weren't so lucky. What elements make up a good commercial website? Of course, web pages should look attractive to a customer.

However, even the most attractive web pages will not make a person come back to a website where it takes too long to find the right product or where order forms don't work. In this lecture, we will discuss what functionality is needed for a successful commercial website and what technology implements various website elements.

1.3 SCOPE OF E-COMMERCE

Electronic Commerce is a term popularized by the advent of commercial services of the Internet. Internet e-commerce is however, only the part of overall sphere of e-commerce. The commercial use of Internet is perhaps typified by once-off sale to consumers. Other types of transactions use other technologies. Electronic Markets (EMs) are in use in a number of trade segments with an emphasis on search facilities and Electronic Data Interchange (EDI) is used for regular and standardized transactions between organizations. The main stream of e-commerce consists of these three areas as depicted in Figure 1.1.

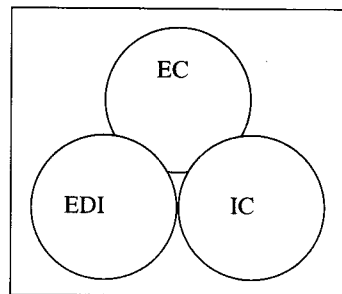


Figure 1.1

1.4 DEFINITION OF E-COMMERCE

E-commerce is a general concept covering any form of business transaction or information exchange executed using Information and Communication Technologies (ICTs). e-commerce takes place between companies, between companies and their customers, or between companies and public administration. E-commerce includes electronic trading of both goods and electronic material.

“E-commerce denotes the use of electronic transmission media (telecommunication) to engage in the exchange of products and services requiring transportation either physically or digitally, from location to location”,

– M. Greenstein and T.M. Feinman

“e-commerce describes the process of buying and selling (or exchanging) of products, services and information via computer networks including the internet”.

– E. Turban and others

e-commerce is the means to complete online transaction and integrate the supply chain into the transaction management process such as receiving orders, making payments and tracking down the deliveries or order.

“e-commerce can be defined as the technology-mediated exchanges between parties (individuals, organisations, or both) as well as the electronic based intra or inter organisational activities that facilitate such exchanges”.

– J. F. Rayport and B. I. Jaworski

“e-commerce as a commercial process includes production, distribution, marketing, sale or delivery of goods and services electronically”.

– World Trade Organization (WTO)

e-commerce is used everywhere in everyday life. It ranges from credit/debit card authorization, travel reservation over a phone/network, wire fund transfers across the globe, Point of Sale (POS) transactions in retailing, electronic banking, electronic insurance, fund raising, political campaigning, on-line education and training, online auctioneering, online lottery and so on. Many people use the term e-commerce and e-business interchangeably, which is factually wrong.

The word ‘commerce’ pertains to buying and selling of goods and services. Whereas, the word ‘commercial’ denotes practices and activities intended to make profit. The substantial commerce is a process of distribution of goods from a place where they are produced and found in plenty to a place where the goods are in short supply or scarce and hence in demand.

The concept of commerce is very comprehensive and complex organism and includes all the necessary functions involved in buying and selling. It contains all persons, organizations and institutions engaged in the distribution of goods. They include railways, road transport, shipping, merchants, banks, insurance, companies, brokers, wholesalers, retailers, stock market, distributors, agents, service providers etc.

The following are the broad limitations of traditional commerce:

Traditionally, commercial transactions have been carried out mainly through paperwork. They are manually transmitted and forwarded by postal services. The process is called paper-based system of commerce. Hence, it can not do all the time and all the seasons.

Delays in finalizing transactions: There are many associated delays in doing business transactions like delays in transportation, delays in manual processing, delays in giving and taking of orders etc.

As it is paper-dominated transaction there are additional costs include data typing, retyping, document storage, handling, maintenance etc.

The conventional commerce system is error prone. There are lots of uncertainties with reference to transportation or logistic, inadvertent delays in payments.

The traditional commercial business process is labor intensive, time consuming and costly affairs.

The advantages of the potential market cannot be obtained quickly, thereby losing customers.

The offline processing will never increase sales and nor will it provide the means of immediate payments.

There is very little room for impulsive buying.

The absence of round the clock buying and level field playing is major drawbacks.

The enhancement of market size is time consuming process and often not advantageous to the remote merchants and customers.

1.5 INTERNET COMMERCE

e-commerce can be used for once-off transactions. The consumer purchasing over the Internet typifies this area of trade but there are other networks such as:

- (i) Television sale channels.
- (ii) The French Mintel is a mature example of an interactive, public access network.
- (iii) e-franchise or business associate networks.

This form of e-commerce may give its customers credit facilities but is typified by the "cash" trade cycle.

The Internet Commerce can be used for all or part of the trade cycle:

- (i) The first stage of the trade cycle is search and the facilities of the internet can be used to locate sites offering, or advertising, appropriate goods or services; a function similar to an electronic markets. In many cases, Internet sites offer only information and any further steps down the trade cycle are conducted on the telephone or at a conventional shop outlet.
- (ii) An increasing number of sites offer facilities to execute and settle the transactions, or in normal parlance to make a purchase-delivery may be electronic or by a home delivery service depending on the nature of the goods or service being offered. The use of the Internet for on-line purchasing is an increasingly common feature on conventional advertising.
- (iii) The final use of Internet e-commerce is for after-sale service. Many IT service/solution providers now offer online support and on-line service such a banking are, arguably, a special case of the use of after-sales transactions. Again the use of the Internet for after sales may not be a follow on to an earlier on-line transaction.

Some of the hype about Internet commerce would seem to suggest that it would displace most or all other forms of retailing. The hype constantly predicts the "break through" a couple of years ahead or once the next piece of technical "gauzing" is in place. The reality however is somewhat different. Some sites, arguably niche traders, are doing very well for example, amazon.com but other sites have produced very little by way of direct sales.

Internet trade is not suited to all goods or to all services or to all people. Marketing strategy is popularly enshrined in the concept of four Ps: Product, price, place and promotion.

1.6 ELECTRONIC MARKETS

According to Been et. al., an electronic market is an inter-organizational information system that provides facilities for buyers and sellers to exchange information about price and product offering. The electronic market is primarily about the search phase of trade cycle as in depicted. The electronic market is most effective in assisting the buyers in a commodity market where products/services are essentially identical across all sellers. In a differentiated market there is variety of products/services offerings and the search problem is complex. An effective electronic market increases the efficiency of the market; it reduces the search costs for the buyers and makes it more likely that the buyer will continue the search until the "best buy" is found. Electronic Markets exists in commodity exchanges, financial markets and they are also extensively used in Airline industry for passenger seat sales. By nature electronic markets, conforms to one of the irregular transaction Trade cycles. A public access network can be seen as an electronic market and can be used with an index or a search engine to find vendors of the required product or service. The general and non-standardized nature of a service such as the Internet does not provide for an optimized electronic market. It may well be that the technical changes in the specification of information, e.g., XML and tags and in the search engine can improve the situation but it is equally likely that the increased volume of information, disparities in technical standards and the commercial imperatives on indexing services will work the other way.

1.7 ELECTRONIC DATA INTERCHANGE (EDI)

"Computer-to-computer" means that the data you send or receive from a bookstore (the most common examples are Invoices or Purchase Orders) is communicated via electronic transmission, without human intervention or interpretation.

"Business documents" means that you will use EDI for the exchange of specific documents only, such as Purchase Orders or Invoices.

"Standardized format" is at the heart of EDI. EDI requires you to follow standards that define the format and content of your business documents. When you start using EDI, your Purchase Orders and Invoices will be converted by the EDI translation software program into the exact same format as those used by all other publishers using EDI. (The publishing industry EDI standards have been set by the BISAC - recently renamed BASIC - committee of the Book Industry Study Group). This means that each Purchase Order, Invoice, or Pack Slip will be completely readable by any computer used by any bookseller using EDI.

Check Your Progress

1. Define e-commerce.
2. Write two advantages of e-commerce.
3. Write two disadvantages of e-commerce.

1.8 LET US SUM UP

E-commerce is a general concept covering any form of business transaction or information exchange executed using Information and Communication Technologies (ICTs). Electronic Commerce is a term

popularized by the advent of commercial services of the Internet. E-commerce is a selling and transfer process requiring several institutes. It is systematic and organized network for the exchange of goods between producers and consumers. Any website or portal that offers products and/or services for sale is a commercial website. E-commerce is highly economical. Doing e-business on the Internet is extremely cost effective. E-commerce emphasizes better and quicker customer service. There are some problems and drawbacks of E-commerce like security, shortage of e-literate people, data protection and the integrity of the system etc. E-commerce takes place between companies, between companies and their customers, or between companies and public administration. E-commerce includes electronic trading of both goods and electronic material. The EDI, trading partners establishes computer-computer links that enables them to exchange information electronically. Electronic market is an inter-organizational information system that provides facilities for buyers and sellers to exchange information about price and product offering.

The internal commerce could be defined as using methods and pertinent technologies for supporting internal business process between individuals, departments, and collaborating organizations. To deliver superior values to its customers today organizations focuses on better coordination, and workflow management, product and service customization, and supply chain management.

1.9 KEYWORDS

Commerce: It pertains to buying and selling of goods and services.

Commercial: It denotes practices and activities intended to make profit.

Substantial commerce: It is a process of distribution of goods from a place where they are produced and found in plenty to a place where the goods are in short supply or scarce and hence in demand.

e-commerce: It is a general concept covering any form of business transaction or information exchange executed using information and communication technologies.

EDI: EDI is based on a set of standardized messages for the transfer of structured data between computer applications.

Internal Commerce: The internal commerce could be defined as using methods and pertinent technologies for supporting internal business process.

Electronic Market: Electronic market is an inter-organizational information system that provides facilities for buyers and sellers to exchange information about price and product offering.

1.10 QUESTIONS FOR DISCUSSION

1. What is e-commerce? Give a definition of your own.
2. Discuss the importance and significance of e-commerce.
3. “The Internet is in itself an example of convergence”. Explain
4. What is meant by EDI? What are the advantages and disadvantages of EDI?
5. Define the Internet Commerce. How it is important in business context?
6. What is meant by electronic market? Discuss its importance.
7. Define internal commerce. How it is relevant in complex business scenario?

Check Your Progress: Model Answer

1. E-commerce is the means to complete online transaction and integrate the supply chain into the transaction management process such as receiving orders, making payments and tracking down the deliveries or order.
2. Two advantages are:
 - ❖ E-commerce is highly economical.
 - ❖ Doing e-business on the Internet is extremely cost effective.
3. Two disadvantages are:
 - ❖ Lack of a blueprint for handling e-commerce.
 - ❖ Security continues to be a problem for online business.

1.12 SUGGESTED READINGS

Kienam, *Managing Your E-Commerce Business*, Prentice Hall of India, New Delhi.

Kosiur, *Understanding E-commerce*, Prentice Hall of India, New Delhi.

Kalakota, Whinston, *Frontiers of Electronic Commerce*, Addison Wesley.

Schneider P. Grey, Perry T. James, *E-Commerce*, Thomson Learning, Bombay.

Shurety, *E-business with Net Commerce* (with CD), Addison Wesley.

Napier, *Creating a winning E-business*, Vikas Publishing House, New Delhi.

Didar Singh, *E Commerce for Manager*, Vikas Publishing House, New Delhi.

Whitely David, *Electronic Commerce*, TMH, New Delhi.

Efraim Turban, Jay Lee, David King & H. Michael Chang, *Electronic Commerce; A Managerial Perspective*, Pearson Education, New Delhi.

LESSON

2

BUSINESS STRATEGY IN AN ELECTRONIC AGE

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- 2.0 Aims and Objectives
- 2.1 Introduction
- 2.2 Business Strategy in Electronic Age
- 2.3 Value Chain
- 2.4 Supply Chain
 - 2.4.1 Enabling Technologies
 - 2.4.2 Types of Supply Chains
- 2.5 Porter's Model of Value Chain
- 2.6 Inter-organizational Value Chain
- 2.7 Competitive Advantages using e-commerce
 - 2.7.1 Advantages of e-commerce to Business Firms
 - 2.7.2 Benefits of e-commerce to Society
 - 2.7.3 Benefits of e-commerce to Customers
- 2.8 Let us Sum up
- 2.9 Keywords
- 2.10 Questions for Discussion
- 2.11 Suggested Readings

2.0 AIMS AND OBJECTIVES

After studying this lesson, you will be able to:

- Explain the value chain and supply chain
- Discuss the Porters value chain model
- Describe the inter-organizational value chain
- Identify and explain the competitive advantages using e-commerce

2.1 INTRODUCTION

Most e-business behaves as a network economy and obeys different laws from traditional commerce. The network economy rests on communications, not commodities. Success on the internet requires a

large presence. In network economies supply creates demand. New business practices need to recognize the differences in conduct in business in a network economy and the network effects.

The whole field of e-business is relatively new. The business and legal models for e-commerce business relationships are evolving very quickly. It is difficult to sustain a competitive advantage with most of these models because they can be easily replicated or rendered obsolete. Some of these models are proving not to be sustainable over the long-term.

These e-commerce business relationships require an appreciation of the technology, the network economy, unique intellectual property issues, and business models applicable to web development agreements, web hosting agreements, web linking agreements, web affiliation agreements, content provider agreements, Web advertising, co-branding and co-marketing agreements, fulfillment agreements, merchandising agreements, channel partner agreements, electronic distribution agreements, and other forms of e-commerce relationships.

2.2 BUSINESS STRATEGY IN ELECTRONIC AGE

The order-to-delivery cycle from the merchant's perspective is generally managed with an eye towards standardisation and cost. This view, developed over the last five decades, is based on the assumption that an organisation must create a set of operating standards for service and productivity, then perform to those standards while minimising the cost of doing so. Often, when orders are delivered, the company measures how the actual delivery stacks up against the guidelines for that activity and what the action costs. If the service standards are met with minimal expense, the company judges the delivery successful. The strengths of this philosophy lie in (i) a company's ability to take the position of low-cost provider, (ii) its stress on benchmarking service, and (iii) its emphasis on responsiveness as well as continuous improvement.

However, this model is incomplete for e-commerce. As an operations-focused, inward-looking vision, it's out of sync with the e-commerce accent on flexibility, customisation, and customer service. Those companies concentrating on performance standards and cost metrics may be headed for big trouble in the e-commerce environment, because the nature of products and services is dramatically different. Instead of asking whether the customer's needs were met effectively, the traditional view is concerned with the percentage of cases of products that were shipped on time and at what cost. To fully realise and maintain a competitive advantage in the online environment, a company must build a robust vision of what its order-to-delivery cycle, and all the business processes that support it, should be.

To achieve a better understanding, it is necessary to examine the Order Management Cycle (OMC) that encapsulates the more traditional order-to-delivery cycle. The typical OMC includes eight distinct activities, although overlapping may occur. The actual details of OMC vary from industry to industry and may differ for individual products and services. However, OMC has the following generic steps.

- (i) **Customer Enquiry and Order Generation:** The business process begins long before an actual order is placed by the customer. What happens in the first step, order planning, already shows how and why lack of cohesive operations can cripple a company. Those farthest from the customer make crucial decisions and open up debate between interdependent functions right from the start. For example, people close to the customer, either in the sales force or in a marketing group at company headquarters, develop a sales forecast. At the same time, a group in the operations or manufacturing function drafts a capacity plan that specifies how much money will be spent, how many people will be hired, and how much inventory will be created. The production planners

often develop the final forecast used to hire workers and build inventory. The lack of internal communication can cause the final result to differ significantly from what is actually needed.

Order planning leads into order generation. Orders are generated in a number of ways in the e-commerce environment. The sales force broadcasts ads (direct marketing), sends personalized e-mail to customers (cold calls), or creates a WWW page. Regardless of the specific marketing approach, the result is almost always the same. The sales and marketing functions worry about order generation, and the other functions stay out of the way. Little coordination takes place across functional boundaries.

- (ii) **Pricing of Product:** Pricing is the bridge between customer needs and company capabilities. But most companies do not understand how to execute order-based pricing in online markets. Pricing at the individual order level depends on understanding the value to the customer that is generated by each order, evaluating the cost of filling each order; and instituting a system that enables the company to price each order based on its value and cost. Although order-based pricing is difficult work that requires meticulous thinking and deliberate execution, the potential for greater profits is simply worth the effort. Often, battles erupt between engineers who do the estimation, accountants who tabulate costs, management that oversees pricing, and the sales force that actually quotes a price. Each group questions the judgement, competence, and goals of the others. Meanwhile, of course, the customer waits for the bid or quote, unattended.
- (iii) **Receipt of Order and Entry:** After an acceptable price quote, the customer enters the order receipt and entry phase of OMC. Traditionally, this was under the purview of departments variously titled customer service, order entry, the inside sales desk, or customer liaison. These departments are staffed by customer service representatives, usually either very experienced, long-term employees or totally inexperienced trainees. In either case, these representatives are in constant contact with customers.
- (iv) **Acceptance of Order and Prioritisation:** Customer service representatives are often responsible for choosing which orders to accept and which to decline. In fact, not all customer orders are created equals; some are simply better for the business than others. In particular, the desirable orders are those that fit the company's capabilities and offer healthy profits. These orders fall into the "sweet spot" region, which represents a convergence of great customer demand and high customer satisfaction, which in turn translates into customer retention.

The importance of order selection and prioritisation is another important matter. Companies that put effort into order selection and link it to their business strategy stand to make more money, regardless of production capacity. In addition, companies can make gains by the way they handle order prioritisation – that is, how they decide which orders to execute faster. These decisions are usually made not by top executives who articulate corporate strategy but by staff who have no idea what that strategy is. While customer service reps decide which order gets filled when, they often determine which order gets lost in limbo. In sum, there is little recognition of the importance that should be placed on order selection and prioritisation in e-commerce.

- (v) **Production Schedule:** During the ordering scheduling phase the prioritised orders get slotted into an actual production or operational sequence. This task is difficult because the different function departments – purchasing, marketing, customer service, operations, or production – may have conflicting goals, compensation systems, and organizational imperatives. Production people seek to minimize equipment changeovers, while marketing and customer service reps argue for special

service for special customers. And if the operations staff schedules orders unilaterally, both customers and their reps are completely excluded from the process. Communication between the functions is often non-existent, with customer service reporting to sales and physically separated from production scheduling, which reports to manufacturing or operations. The result is lack of interdepartmental coordination.

- (vi) **Order Fulfilment and Delivery:** During the order fulfilment and delivery phase, the actual provision of the product or service is made. Often, order fulfilment involves multiple functions and locations: Different parts of an order may be created in different manufacturing facilities and merged at yet another site, or orders may be manufactured in one location, warehoused in a second, and installed in a third. In some businesses, fulfilment includes third-party vendors. In service operations, it can mean sending individuals with different talents to the customer's site. The more complicated the task, the more coordination required across the organisation. And the more coordination required, the greater the chance that the order is delayed.
- (vii) After the order has been fulfilled and delivered, billing is handled by the finance staff, who view their job as getting the bill out efficiently and collecting quickly. In other words, the billing function is designed to serve the needs and interests of the company, not the customer. Often customers don't understand the bill they receive, or they believe it contains inaccuracies. The bill may not be inaccurate, but it is usually constructed in away more convenient for the billing department than for the customer.
- (viii) **Customer Service and Support:** This phase plays an increasingly important role in all elements of a firm's profit equation: customer value, price, and cost. Depending on the specifics of the business, it can include such elements as physical installation of a product, repair and maintenance, customer training, equipment upgrading, and disposal. Because of the information conveyed and intimacy involved, post sales service can affect customer satisfaction and company profitability for years. But in most companies, the post sales service people are not linked to any marketing operation, internal product-development effort, or quality assurance team.

2.3 VALUE CHAIN

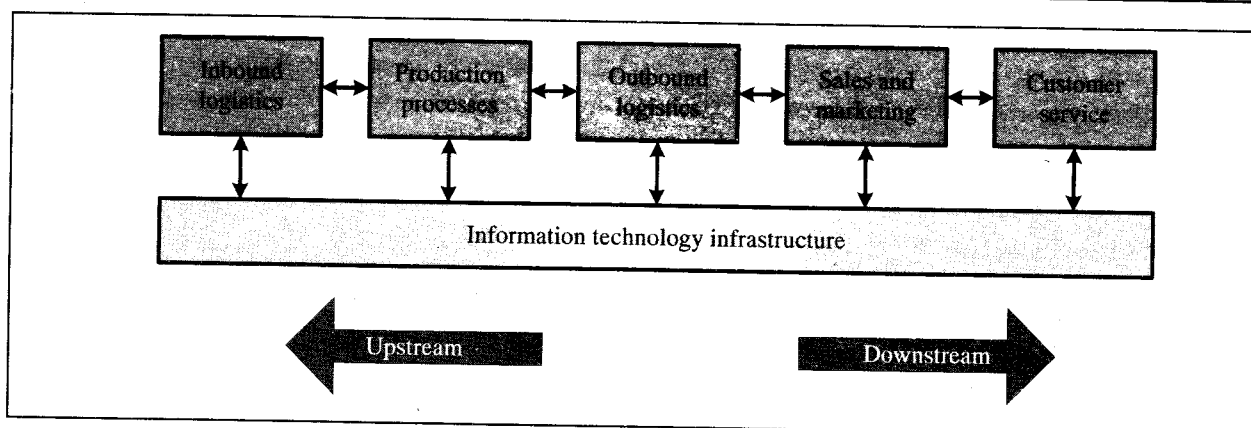


Figure 2.1 Value Chain

A model that believes how supply chain activities can add value to products and services delivered to the customer.

The key to intra-business e-commerce is improving value chain effectiveness. Definition for Value chain from e-marketing which provides succinct definitions of the many terms related to managing and implementing Internet marketing today.

For each Internet marketing term I define, there is a link below to all other pages on this site that offer more detailed information, including the latest developments. So this Internet marketing glossary is not static, but continually updated.

Conducting business online. Selling goods, in the traditional sense, is promising to do electronically because of certain software programs that run the main functions of an e-commerce Website, including product display, online ordering, and inventory management. The software resides on a commerce server and works in conjunction with online payment systems to process payments. Since these servers and data lines make up the backbone of the Internet, in a broad sense, e-commerce means doing business over interconnected networks.

The definition of e-commerce contains business activities that are business-to-business (B2B), business-to-consumer (B2C), extended enterprise computing (also known as “newly emerging value chains”), d-commerce, and m-commerce. e-commerce is a major factor in the U.S. economy because it assists companies with many levels of current business transactions, as well as creating new online business opportunities that are global in nature.

Here are a few examples of e-commerce:

- Accepting credit cards for commercial online sales
- Generating online advertising revenue
- Trading stock in an online brokerage account
- Driving information through a company via its intranet
- Driving manufacturing and distribution through a value chain with partners on an extranet
- Selling to consumers on a pay-per-download basis, through a Website

2.4 SUPPLY CHAIN

Supply chain management consists of the coordination of demand and supply of products and services between a suppliers' supplier and a customers' customer. It involves the flow of product, information, and money between the 'trading partners' of a company's 'supply chain'.

To define “Supply Chain Management” we have to pull apart the parts of that term.

SUPPLY – Providing Goods, Services and knowledge

CHAIN – Across several entities that are linked

MANAGEMENT – Infers Pro-activity

The Proactive act of improving the efficiency and effectiveness of the flow of goods, services and knowledge across all stake holders with the goal of reducing total cost and obtaining a competitive advantage for all parties.

The Internet wave and emergence of e-business has highly influenced traditional supply chains by enhancing coordination and communication between the partners. The enabling technologies like

EDI, Intranet, Extranet, Electronic Market Places, ERP, DRP, Warehouse management system, CRM, CPFR etc. has tremendously improved the integration among the buyers and sellers.

The wonder letter 'e' has removed the roadblocks of information sharing making the firm smarter everyday. Rapid evolution of the digital marketplaces or hubs which allows buyers and sellers to transact in a single intelligent, multidimensional marketplace that connects multiple trading exchanges and making the sharing of information at a wink of an eyelid.

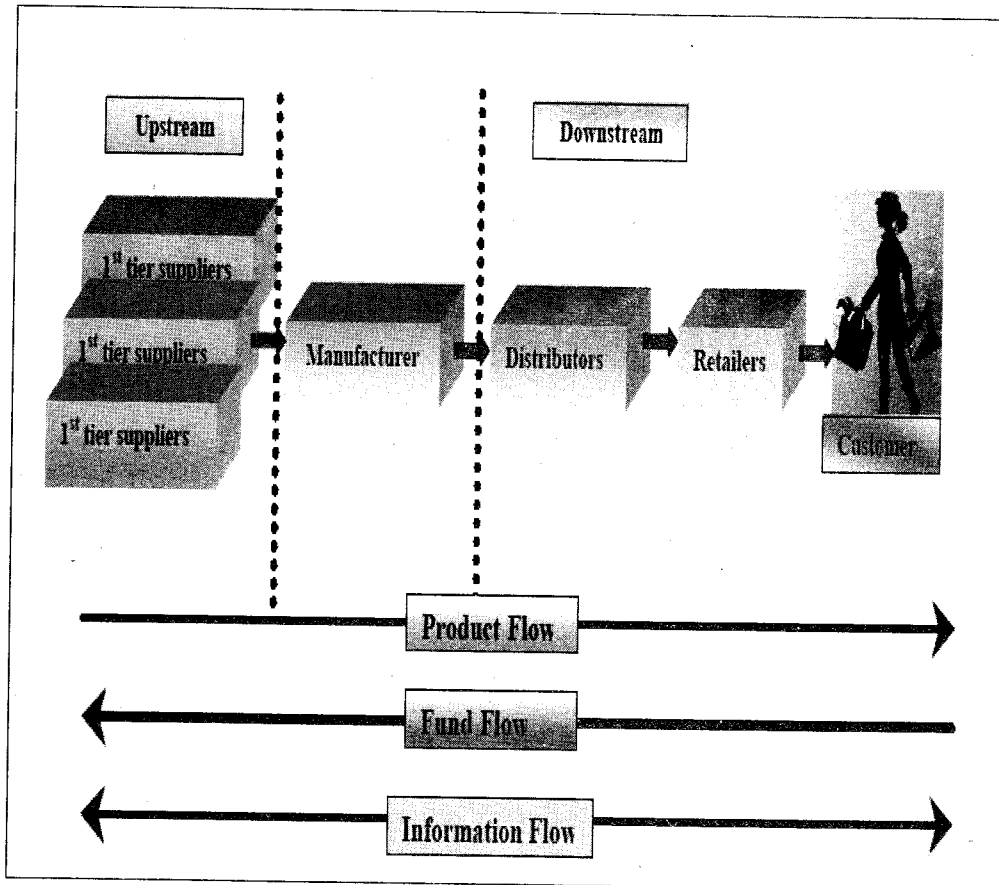


Figure 2.2: Stages in the Supply Chain and Flows between the Stages

e-business has enhanced both Supply Chain efficiency and responsiveness by sharing real time information regarding inventory, shipment status and other key information like product design, product availability and demand between the partners. The e-supply Chain will have customers and suppliers seamlessly linked together, throughout the world, exchanging information almost instantly. As a result of e-speed information sharing the companies are adopting pull strategy instead of push strategy. Fast access to relevant supply chain information can pay-off handsomely in lower product acquisition costs, lower procurement transaction, less inventory, higher quality decision-making, shorter cycle times, profitable means of disposing unused excess inventory and better customer service.

2.4.1 Enabling Technologies

- i. **Electronic Data Interchange:** EDI is a method to automate the traditional paper based, error prone and time consuming business transactions. EDI is computer-to-computer direct transfer of standard business documents through electronic media between the firms. The EDI helps in

Just-in-Time production and continuous production because of automation of internal processes. EDI is an important industrial network technology, suited to support communications among the partners.

EDI helps for enhanced corporate image and better relation with the trading partners by reducing lead-time and improving information sharing.

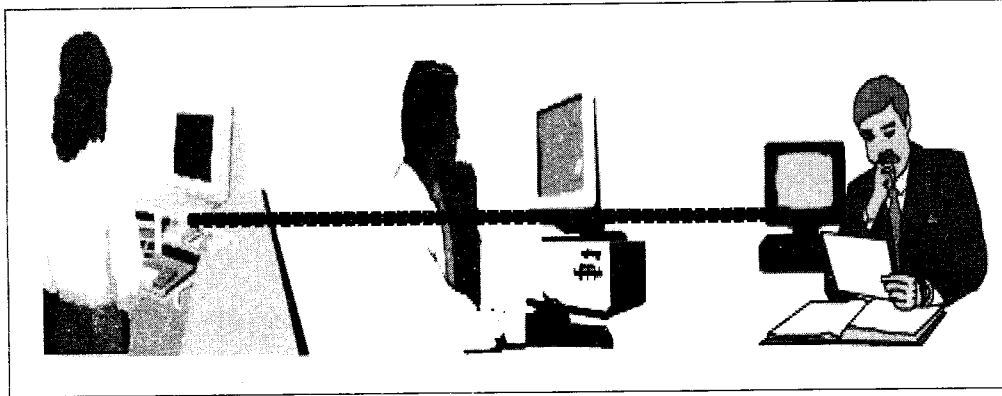


Figure 2.3: Electronic Data Interchange

- ii. **Intranets:** Intranet is an Internet like network inside an organization. It is a corporate LAN or Wide Area Network (WAN) that uses Internet technology and is secured behind company's firewalls. Intranets tremendously improve the communication and internal management by enhanced knowledge sharing. The intranets helps to share documents among the employees regardless of their geographic location like policies and procedures, training programmes, product catalogs, design drawings and manuals.

For example, Ford is using Web technologies to reengineer its internal business processes as well as those between the company and its dealers, suppliers and customers. Ford's global intranet brings 4500 engineers from labs in the United States, Germany and England together in cyberspace to collaborate on automobile design projects. The idea is to break down the barriers between regional operations so that basic auto components are designed once and used everywhere. When design plans conflict the software automatically sends out e-mail alerts to members of design teams. When all of the pieces are in place, the company hopes to transform the way it designs and produces cars, so it can quickly build them to order.

- iii. **Extranets:** Extranets combine the privacy and security of intranets with the global reach of the Internet, granting access to outside business partners, suppliers and customers to a controlled portion of the enterprise network. They are network links that use Internet technologies to interconnect the intranet of a business with the intranets of its customers, suppliers or other business partners.

For example, Adaptec, Inc is a \$1 billions microchip manufacturer supplying critical components to electronic equipment makers. The company outsources the manufacturing tasks concentrating on product research and development. Before it was implemented extranet Adaptec required up to 15 weeks to deliver products to customers.

Competitors were able to deliver similar chips in only eight weeks. The longer delivery time was mainly caused by the need to co-ordinate design activities between Adaptec headquarters in California and its three principal fabrication factories in Hong Kong, Japan and Taiwan. Once

they introduced extranet and enterprise - level supply chain integration software that incorporates automated workflow and EC tools, communication with manufacturers across several zones became very easy. Adaptec can send chip design diagrams over the extranet, enabling the manufacturers to prepare for product changes and new designs.

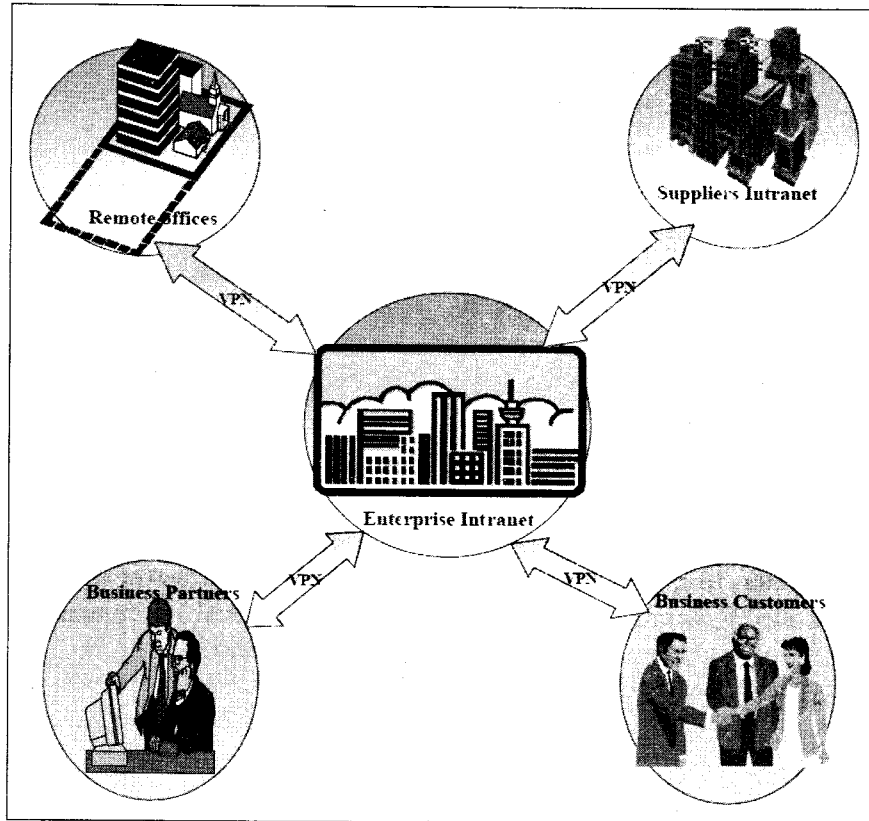


Figure 2.4: Intranet Connection for Supply Chain Management

- iv. **B2B Collaboration:** In the traditional supply chain, buying and selling materials means establishing long-term relationships with vendors, distributors and retailers. With the advent of Internet it is easy for the buyers and suppliers to meet, buy and sell across cyber market places and collaborate more quickly than the traditional way. It offers them a wide spectrum of advantages like Online ordering and tracking, managing their logistics, sharing the forecast, demand and POS information etc. The B2B market places are classified as Net market places or private market places. Also they are classified based on Buyer or Seller launched B2B market places.
- (a) **Net Market Place:** The Net market is independently owned market place that brings thousands of suppliers and buyers to cyber space in a dynamic real time environment. The buyers may not know the vendors and the Net market place connects this anonymous buyers and sellers according to the requirements of both. They could be a horizontal like Tradeout.com or vertical market place like steel.com. Vertical market places serve specific industries like food, steel, automobile etc. Horizontal market places serve all types of products serving different types of supplying firms as well as buyer firms like apparels, finance, cars, and other category of products together.

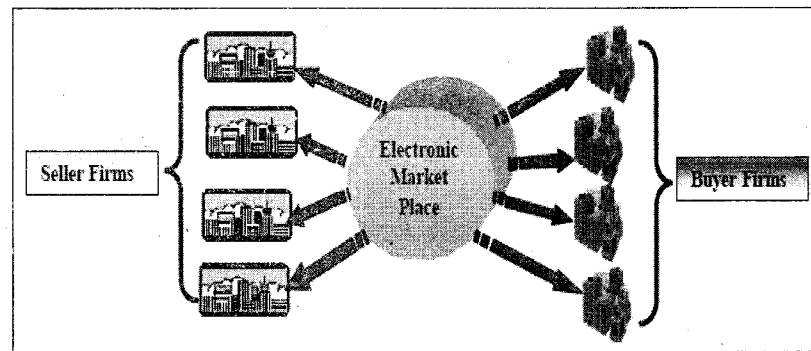


Figure 2.5: Electronic Market Place

- (b) *Private Market Place*: Private market place is a trading exchange in which membership is closed or by invitation only. The company that owns the market place launches it. Sometimes they are also called as Collaborative Commerce. Private market places brings business firms that collaborate to develop highly efficient and responsive supply chains to cater the needs of customers.

For example, Wal-Mart has connected all its point of sale and its point of sale and its 75,000 suppliers. Once the customer sales are captured at the POS, Wal-Mart conveys the information and replenishment orders to the warehouse and distributor. Also it conveys this information to manufacturers like P&G. This helps in better inventory management. This also tells Wal-Mart and its suppliers the exact level of demand for thousands of products. This process is also called the demand-pull system.

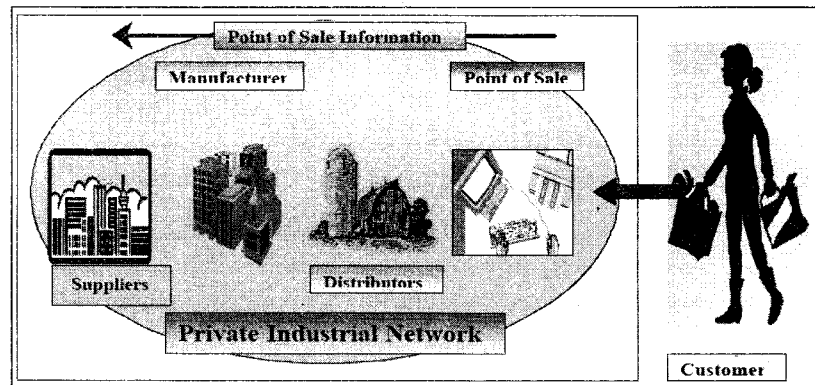


Figure 2.6: Wal-Mart and P&G Collaboration

Some very successful companies have formed their own private exchanges – Dell, for instance, has built Valuechain.dell.com, while Cisco has created its famous eHub. This brings aggregation capabilities to their customers and suppliers and strengthens the whole value chain.

- v. *Collaborative, Planning, Forecasting and Replenishment (CPFR)*: Collaborative, Planning, Forecasting and Replenishment is one of the fastest growing technologies for both retail and consumer goods firms. CPFR is seen as a new business essential for collaboration. CPFR is a combination of Continuous Replenishment Programmes (CRP) and Vendor-managed Inventory (VMI). CPFR involves working with network members to forecast demand, develop production plans, develop joint sales and operational plans, coordinate shipping and warehousing details and electronically collaborate to generate and update sales forecasts and replenishments plans.

CPFR collaboration requires information technology to build, share and adjust online forecasts and plans. The core objective of CPFR is to increase the accuracy of demand forecasts and replenishment plans to lower inventories. It requires trust between partners.

For it to succeed, partners must be willing to share their promotion schedules, POS data, and inventory data. CPFR is proving to be a Win-Win situation for the partners involved in meeting the customers demand, reducing inventory, lowering costs and improving the bottom line.

2.4.2 Types of Supply Chains

The term “supply chain” gives rise to associations of serial cooperation where materials and products are closely correlated throughout a chain of value-creating activities, which are like pearls on a string. Practically speaking, the relationships between the implicated companies are often quite complex. Some relations can be rather close and stable, while others are more short-term and ad hoc in nature.

The supply network is a more complete term than supply chain. As supply chain management has become a generally accepted term in the business community.

There are many different types of supply chains, Harland (2001) has suggested four main types, each of which has distinctive characteristics and specific demands on the cooperation between participants. These classifications are based on two dimensions:

Dynamic versus Stable Supply Chains

Dominant company versus balanced power distribution in the supply chain

By combining these two dimensions, four generic supply chain types result. These types are shown in Figure 2.7.

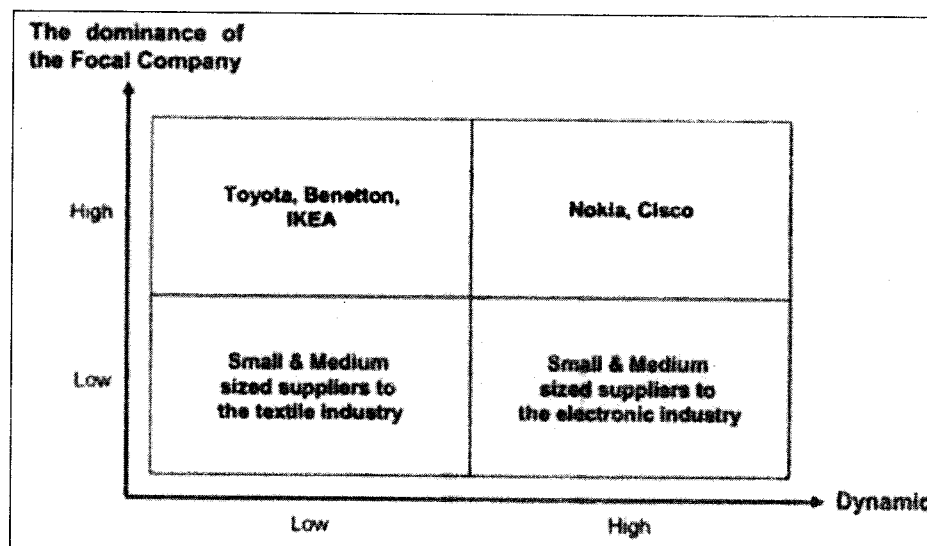


Figure 2.7: Typology of Supply Chain

- Type 1:** Dynamic/low level of influence from the company in focus – This type operates under dynamic conditions while the company in focus has only limited influence on the other participants involved in the supply chain. The dynamic conditions could be explained by frequent internal process changes, due to multiple product configurations or external market conditions, with a myriad of competitors as well as many new product launches. The low degree of influence

exerted by the company in focus may be explained by the fact that the company does not contribute a great degree of value for example, in the form of volume or innovative products/processes, to the other supply chain participants. In this situation, the most important activities in relation to the other companies involved to motivate them to participate in an integrated cooperation and to secure a fair distribution of risks and benefits. Examples can be found with the smaller sub-vendors in an industry.

- **Type 2:** Dynamic/high degree of influence held by the company in focus – In this type of supply chain, the focus company has power/influence over the other participants. In this situation, the focus company will typically, as a result of their purchasing power or innovative ability/image, be an important cooperative partner for the other links in the supply chain. A company such as B&O will, following this principle be an attractive customer for many suppliers, as it would generally be seen as a mark of quality to be a key supplier to B&O another example is Nokia, who due to their size and innovative product development, will lend value to the images of their customers and suppliers. In this type of example, the focus company will be in a position to pick and choose their cooperative partners rather than being chosen, for example, because they have implemented VMI or because they live up to specific requirements made on retail shops regarding product availability, shop decoration/furnishings, and education of personnel.
- **Type 3:** Static/focus company has a low level of influence – This supply chain works under stable conditions, both internally and externally. Total cost effectiveness will often be the primary aspect of competition. Focus will be on increasing effectiveness within the logistics processes, including improving processes, integrating information systems, reducing inventory, and making full use of capacity. In order to realize these forms of increasing effectiveness, the focus company must be able to motivate the other participants as well as give them fair portion of the resulting savings relative to the risks that they have taken. Examples can be found among small suppliers in the process industry or the textile industry.
- **Type 4:** Static/focus company has high degree of influence – In this type of supply chain, the focus company enjoys a high degree of influence over the other parties involved. This situation indicates that the dominant company can choose its cooperation partners and make the necessary decisions regarding the organization of the supply chain, as well as increasing its effectiveness. A typical focus company of this type would be IKEA, whose product line can remain stable over a long period of time.

This illustrated classification of the main types of supply chains can aid the individual company in its effort to identify the type it most closely resembles, and which activities the company should focus on when building relationships with other companies.

2.5 PORTER'S MODEL OF VALUE CHAIN

The value chain framework of Michel Porter is a model that helps to analyze specific activities through which firms can create value and competitive advantage.

The Activities of Value Chain:

- Primary activities
- Supportive activities

- **Primary Activities:** The primary activities or line functions of value chain are:
 - ❖ *Inbound Logistics:* It includes receiving, storing, inventory control, transportation planning.
 - ❖ *Operations:* It includes machining, packaging, assembly, equipment maintenance, testing and all other value-creating activities that transform the inputs into the final product.
 - ❖ *Outbound Logistics:* The activities required to get the finished product at the customers: warehousing, order fulfillment, transportation, distribution management.
 - ❖ *Service:* The activities that maintain and enhance the product's value, including customer support, repair services, installation, training, spare parts management, upgrading etc.
- **Support Activities:** The support activities or staff functions of value chain are:
 - ❖ *Procurement:* Procurement of raw materials, servicing, spare parts, buildings, machines, etc.
 - ❖ *Technology Development:* Includes technology development to support the value chain activities. Such as: Research and Development, Process automation, design, redesign.
 - ❖ *Human Resource Management:* The activities associated with recruiting, development, retention and compensation of employees and managers.
 - ❖ *Firm Infrastructure:* Includes general management, planning management, legal, finance, accounting, public affairs, quality management, etc.

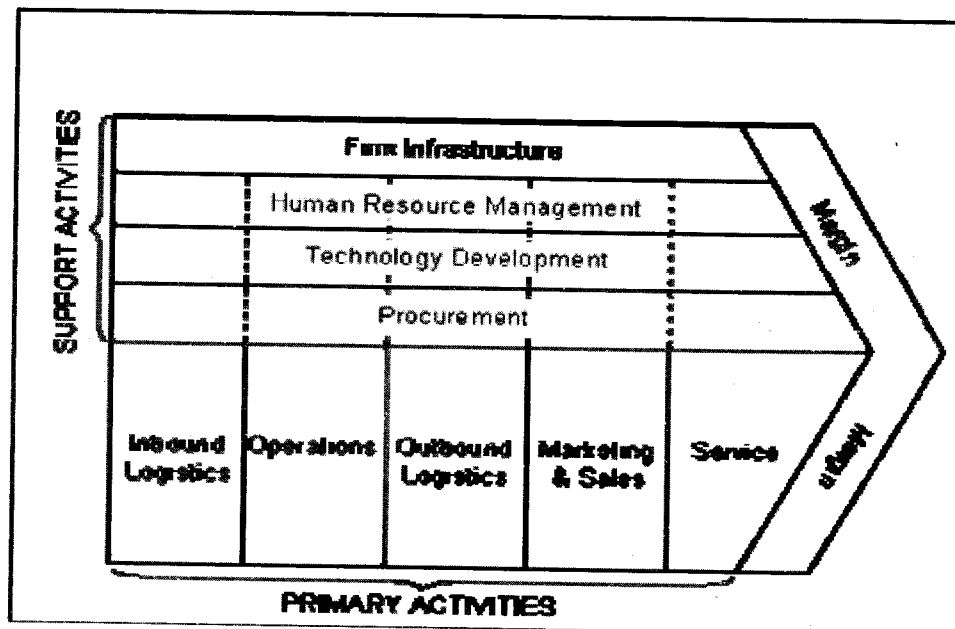


Figure 2.8: Michael Porter's Value Chain

2.6 INTER-ORGANIZATIONAL VALUE CHAIN

Value chain is a high-level model of how businesses receive raw materials as input, add value to the raw materials through various processes, and sell finished products to customers.

For the e-commerce to reach its fullest potential the synergy of concept addressing the three elements is essential and these are: customer-organization, interorganizational, or internal automation activities.

The technologies and methods associated with the electronic commerce are used extensively within organization, where the focus is on operations and other aspect of gaining efficiency. These are known by various names like enterprise integration, process control systems, business process re-engineering, and work flow management. The internal commerce is the usage of e-commerce to processes or operations.

Definition of Internal Commerce

The internal commerce could be defined as using methods and pertinent technologies for supporting internal business process between individuals, departments, and collaborating organizations.

To deliver superior values to its customers today organizations focuses on better coordination, and workflow management, product and service customization, and supply chain management.

Workflow Management

The workflow re-engineering efforts have been used to only few tasks or departments in the past. However, the usage of this effort to other activities and departments is recently being done with an objective to improve the productivity. Many organization in India are now using the SAP to distribute the documents electronically, approve the ticketing, travel expenditure, leave approval and other work related processes electronically.

Product or Service Customization

The consumer demands and expectations are now not satiated just be the simplicity. On the contrary customers are now demanding more made-to-order or customized products with rapidly shrinking lead-time. The customization in the area of electronics and computers, with 'bundled features' is increasing every day.

The customization is often associated with agile manufacturing. The global competitiveness has popularized the concepts like world-class engineering, agile manufacturing, and lean production.

Customization focuses on two concepts:

- (i) Time-to-time markets and
- (ii) Flexible operations

Supply Chain Management

A supply chain is the network of suppliers and customers within which any business operates. For instance, the computer manufacturer has a chain of suppliers for its chip, disc drives, etc. and a chain of customers in its retailers, resellers and customers. The supply chain management is important as it is becoming difficult to compete by the enterprises at the business or industrial level as an isolated business entity.

For the purpose improving the competitiveness the organizations are aligning the coordinated network of companies in the form of groups of producers, associates of suppliers, distributors, retailers, and support providers.

2.7 COMPETITIVE ADVANTAGES USING E-COMMERCE

E-commerce is now available everywhere every time. As soon as you click onto the Net, some very attractive banner advertisement invites you to its web sites and tries to tell you products or services.

Areas that are groceries by leaps and bounds are financial services, entertainment, travel, retailing groups etc. It was estimated by Forrester Research, spending on new web sites will jump to ₹ 1330 billions in 2002 up from ₹ 300 billions in 1987, thus there is roughly 45 times growth in spending in five year period.

2.7.1 Advantages of e-commerce to Business Firms

The major advantages of e-commerce are:

- **Economy:** E-commerce is highly economical. Unlike the brick-and-mortar environment, in e-commerce there is no rental of physical store space, insurance, or infrastructure investment. All you need is an idea, a unique product, and a well-designed Web storefront to reach your cyber-customers, plus a partner to do fulfillment.
- **Lower Cost:** Doing e-business on the Internet is extremely cost effective; it reduces logistical problems and puts a small business on a par with giants like Amazon.com, Sears, General Motors, or Bank of America. In a commercial bank, for example, a basic over-the-counter transaction costs ₹ 52.95 to process; over the Internet, the same transaction costs about 1 rupee. Every financial transaction eventually turns into an electronic process. The sooner it makes the conversion, the more cost-effective the transaction becomes.
- **Better Customer Service:** E-commerce emphasizes better and quicker customer service. Web-based customer service makes customers happier. Instead of calling your company on the phone, holding for 10 minutes, then getting to a clerk who taps into your account, the Web merchant gives customers direct access to their personal accounts over the Web. It saves time and money. It is a win-win proposition. For companies that do business with other companies, adding customer service to the Web is a competitive advantage. The overnight package delivery service, where tracking numbers allow customers to check the whereabouts of a package online, is one good example.
- **Greater Profit Margin:** E-commerce means greater profit margins. For example, the cost of processing a conventional airline ticket is ₹ 400. According to one travel agency, processing the same ticket (called e-ticket) over the Web costs ₹ 50 only. Along with higher margins, business can gain more control and flexibility and are able to save time when manual transactions are done electronically.
- **Knowledge Markets:** E-commerce helps create knowledge markets. Small groups inside big firms can be funded with seed money to develop new ideas. For example, Daimler Chrysler has created small teams to look for new trends and products. A Silicon Valley team is doing consumer research on electric cars and advising car designers.
- **Swapping Goods and Services:** Swapping is trading something you have for something you want more. Offering goods or services through barter is gaining in popularity through sites like Web Swap, www.BarterTrust.com, and www.Ubarter.com. Here is how it works: Sam, a networking consultant, offers his technical services through a barter company. People pay currency into Sam's account in exchange for his services. Instead of accepting the cash, he turns around and buys things (a PC, carpeting). The barter house keeps a modest commission to expedite the exchange.

- **Information Sharing, Convenience and Control:** Electronic market places improve information sharing between merchants and customers and promote quick, just-in-time deliveries. Convenience for the consumer is a major driver for changes in various industries: Customers and merchants save money; are online 24 hours a day, 7 days a week; experience no traffic jams, no crowds and do not have to carry heavy shopping bags. Control is another major driving factor. For example, instead of banks controlling the relationships with the customer, customers today can have more control of their banking needs via Internet Web sites. Banks like Bank of America and ICICI now give customers access to their accounts via the Web.
- **Quick Comparison Shopping:** E-commerce helps consumers to comparison shop. Automated online shopping assistants called hopbots scour Net stores and find deals on everything from applesauce to printer ribbons. For example, mySimon (www.mysimon.com) learns the navigation preferences of its runner (a tool that fills out the request form asking the bot to search Web pages for solutions). It lets you enter basic keywords such as "ladies dress" to search its database of Web stores for the best buys.
- **Teamwork:** E-commerce helps people work together. e-mail is one example of how people collaborate to exchange information and work on solutions. It has transformed the way organizations interact with suppliers, vendors, business partners, and customers. More interaction means better overall results. A recent study of 40 corporate Internets by the MET A Group found that the typical Intranet (within-company network) had an average Return on Investment (ROI) of 38 per cent. Networks that provided collaborative capabilities had a 40 per cent ROI and those that gave people direct access to needed information had a 68 per cent ROI. The implication is that the more interactive and the more "Collaborative-rich" the Web site, the higher the payoff for the business (www.IBM.com).
- **Productivity Gains:** E-commerce means productivity gains. Weaving the Web throughout an organization means improved productivity. Take the example of IBM, which incorporated the Web into every corner of the firm-products, marketing, and practices. The company figured it would save \$750 millions by letting customers find answers to technical questions via its Website. The total cost savings in 1999 alone was close to \$1 billion (www.IBM.com for recent details).
- **Customization:** Digital products are highly customizable. They are easy to reorganize, revise, or edit. With information about consumer tastes and preferences, products can be differentiated (customized) and matched to individual needs.
- **Ensure Secrecy:** EC devices invariably have in-built security measures. For example password, encoding cryptography, cipher etc. are some of the mechanisms/measures which provide security and prevent unauthorized access and use of data, information and transactions.
- **Other Benefits:** The other benefits include improved image, improved customer services, new found business partners, simplified processes, compressed cycle and delivery time, increased productivity, eliminating paper, expediting access to information, reduced transportation costs, and increased flexibility.

2.7.2 Benefits of e-commerce to Society

It helps society in the following ways:

- Enables individuals to work at home and to do less traveling for shopping, resulting in less traffic on the roads and lowers air pollution.

- Allows some merchandise to be sold at lower prices and helps in increasing standard of living.
- Enables people in Third World countries and rural areas to enjoy product and services that otherwise are not available to them.
- Facilitates delivery of public service such as health care, education and distribution of government social service at reduced cost and/or improved quality.

2.7.3 Benefits of e-commerce to Customers

The customers can enjoy the following benefits of e-commerce:

- **Customer Convenience:** A website is open 24 hours a day. It can take orders, keep an eye on deliveries, and receive payments, at any time of convenience to the customer.
- **Product/Service made to Customer's Order:** E-commerce enables the customers to get the products/services made as per particular needs. Manufacturers may even invite customers to design the product/service exactly as they want it and thus earn their goodwill.
- **Wider Choice:** Customers can access websites of as many competing suppliers as desired to, decide on which product/service would best meet their need. They do not need to drive to different shops for this purpose. In any case, a website can offer any number of products/services and in any detail without any space or inventory limits as in case of a shop or market place.
- **Quick Delivery:** In case of digitized products, electronic commerce allows quick delivery.
- **Cheaper Products/Services:** Electronic commerce allows customers to visit websites of several business firms and make comparison of their offering. Thus, he can get cheaper products/services of required quality by visiting various websites.
- **Virtual Auction:** The customers can participate in virtual actions through Internet. For example, several airlines put air tickets to specify destination on auction and the customers are free to offer any price.
- **Competition:** Electronic commerce creates competition between product and service providers. The customers are benefited in the form of lower prices.

Check Your Progress

Fill in the blanks:

1. Two types of Net market place are and
2. The full form of CPFR is
3. Intranet is an Internet like inside an organization.
4. Extranets combine the privacy and of intranets with the global reach of the Internet.

2.8 LET US SUM UP

The order-to-delivery cycle from the merchant's perspective is generally managed with an eye towards standardization and cost. Value chain provides succinct definitions of the many terms related to

managing and implementing Internet marketing today. Supply chain management consists of the coordination of demand and supply of products and services between a suppliers' supplier and a customers' customer. The enabling technologies like EDI, Intranet, Extranet, Electronic Market Places, ERP, DRP, Warehouse management system, CRM, CPFR etc. has tremendously improved the integration among the buyers and sellers. e-business has enhanced both Supply Chain efficiency and responsiveness by sharing real time information regarding inventory, shipment status and other key information like product design, product availability and demand between the partners. The B2B market places are classified as Net market places or private market places. Vertical market places serve specific industries like food, steel, automobile etc. Horizontal market places serve all types of products serving different types of supplying firms as well as buyer firms like apparels, finance, cars, and other category of products together. The company that owns the market place launches it. e-commerce is now available everywhere every time. As soon as you click onto the Net, some very attractive banner advertisement invites you to its websites and tries to tell you products or services.

2.9 KEYWORDS

Value Chain: It provides succinct definitions of the many terms related to managing and implementing Internet marketing today.

Supply Chain Management: It consists of the coordination of demand and supply of products and services between a suppliers' supplier and a customers' customer.

EDI: It is computer-to-computer direct transfer of standard business documents through electronic media between the firms.

Net Market: It is independently owned market place that brings thousands of suppliers and buyers to cyber space in a dynamic real time environment.

Private Market Place: It is a trading exchange in which membership is closed or by invitation only.

2.10 QUESTIONS FOR DISCUSSION

1. What is e-commerce value chain?
2. What is the advantage of online customer service?
3. What is business-to-business (B2B) e-commerce? Describe with example.
4. Compare and contrast intranet and extranet.
5. What is Supply Chain Management? How is it important?
6. What is EDI? How does it help in Web based Business?

Check Your Progress: Model Answer

1. Horizontal market place, vertical market place
2. Collaborative, Planning, Forecasting and Replenishment
3. network
4. security

2.11 SUGGESTED READINGS

Ravi Kalakota, Andrew Winston, *Frontiers of Electronic Commerce*.

P.T. Joseph, *E-Commerce - A Managerial Perspective*.

G. Winfield Treese & Lawrence C. Stewart, *Designing Systems for Internet Commerce*.

Kamelesh K Bajaj, Debjani Nag, *E-Commerce: The Cutting Edge of Business*.

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Judy Strauss, Adel El-Ansary, Raymond Frost, *E-Marketing*, 3rd Edition, Pearson Education, 2003.

UNIT II

LESSON

3

STRATEGIC IMPLICATIONS OF IT

CONTENTS

- 3.0 Aims and Objectives
- 3.1 Introduction
- 3.2 Strategic Implications of IT
- 3.3 Business Capability
- 3.4 Strategic Formulation
 - 3.4.1 Process of Formulating e-commerce Strategy
 - 3.4.2 Designing the System
 - 3.4.3 Some Pitfalls to Avoid during Planning
 - 3.4.4 Strategy Assessment
 - 3.4.5 Review your Web Traffic Analysis
- 3.5 Implementation Planning
- 3.6 E-commerce Implementation
- 3.7 Evaluation of e-commerce
- 3.8 Let us Sum up
- 3.9 Keywords
- 3.10 Questions for Discussion
- 3.11 Suggested Readings

3.0 AIMS AND OBJECTIVES

After studying this lesson, you will be able to:

- Explain the strategic implications of IT
- Discuss business capability
- Describe the strategy formulation
- Identify and explain the implementation planning
- Discuss the e-commerce implementation
- Explain the e-commerce evaluation

3.1 INTRODUCTION

The continued enhancements of information technologies facilitate and increase knowledge intensity in organizations. As such, knowledge and information technologies play critical roles in the development of competitive advantage by firms. For example, IT facilitates organizational learning and helps firms move into international markets by making it easier to coordinate geographically dispersed units and operations. Even entrepreneurial new venture firms are moving into international markets earlier in their life cycle (Oviatt and MacDougall, 1977; Zahra *et al.*, 2000). IT has become especially important to smaller, entrepreneurial firms to facilitate their networking and cooperative ventures with other firms in order to compete more effectively with much larger firms for major projects. Furthermore, information technologies facilitate these firms' technological learning, a critical element to their survival and long-term success (Zahra *et al.*, 2000). IT has also helped firms from emerging markets (e.g., Korea, Mexico) compete more effectively against firms from developed markets that have more resources. Thus, IT has helped facilitate the increasing globalization of businesses.

3.2 STRATEGIC IMPLICATIONS OF IT

“In assessing the strategic implications of information technology for the next three years within any company or enterprise, senior executives need to realize that there are significant new developments that are fundamentally changing how teams collaborate, and how companies accomplish their objectives. The role of traditional Information Technologies (IT) has changed to being the enabler of strategic business processes. IT has in effect become the catalyst for many organizations to completely re-align their processes, making them more efficient and customer-centered at the same time. Foremost amongst these developments is the exponential growth of Web 2.0 (O'Reilly, 2005) and the series of collaborative, enterprise-wide applications of these concepts have fostered.

IT Outsourcing

IT outsourcing is a growing phenomenon in the developed economies. However, it is not often managed as strategically as it might be. Drawing on evidence from 30 case histories in the United Kingdom, this article presents the basis for a strategic approach. It identifies six critical factors around which IT outsourcing decisions can be based, provides a framework for decision-making based on organizational experiences of different levels of success, and discusses the additional factors that need to be borne in mind as a reality check, to ensure that the IT outsourcing decision can be delivered upon. The paper argues for a more strategic approach to IT outsourcing and provides frameworks to enable decision-makers to think through the issues presented by an impending IT sourcing decision.

Real Estate Sector

How society, its institutions and organizations relate to place and space is largely defined by advances in information, and communications and transportation technology. Advances in information technology transform society's relationships to and involvement in economic and social activity, and therefore the real estate processes, systems, procedures and relationships that characterize the real estate that support society's space-using economic and social activity. Information technology advances simultaneously introduce complexity and simplicity to the real estate sector. Now, we are seeing a convergence of functions, as a particular space assumes multiple purposes, similar to the earliest phases of economic history. The resources and purposes of activities that occur in traditional work

environments will increasingly reflect those that have been thought of as occurring in residential environments, and homes will have all the resources and electronic capabilities of places of business and merchandising. Ultimately, the implications of information technology for the real estate discipline challenge all involved to craft strategies reflecting an understanding of the direction and pace of society's transforming relationship to place and space.

Supply Chain

Efficient utilization of information technology is an essential component of a successful supply chain management strategy. Two typical supply chain technologies are automatic identification and data capture, and the electronic transfer of information via electronic data interchange and/or internet collaboration. Examples of their applications are abundant in the literature. However, the strategic aspects of their selection and implementation have for the most part been neglected until recently, and much of the literature fails to address the human and process factors involved in deploying this technology. This lesson presents a model for the strategic implementation of information technology in supply chain management based on an analysis of the long-term impact of these two technologies, along with relevant considerations concerning their execution. Discussion of their future in the light of possible technological developments is also included.

3.3 BUSINESS CAPABILITY

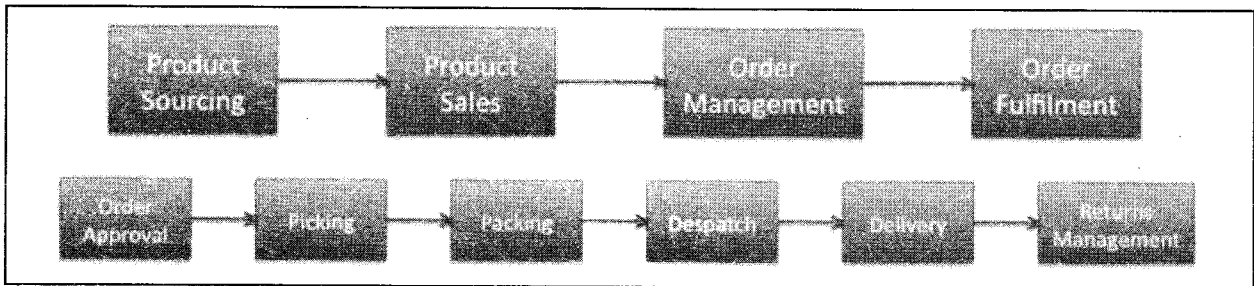
Understanding the capabilities required by your business provides a high level overview of the business and can be a very useful exercise as it allows one to take a step back and focus on what the key elements of the business are. You can avoid getting bogged down in the details of 'how' things happen and concentrate on 'what' does (or needs to) happen. Once you have done this it is possible to identify your key capabilities, for example, the ones that will differentiate your business and you can use this information to ensure that you focus on the areas of importance in your business, whether this is in defining new projects or ensuring business as usual delivers appropriately.

We use Business Capabilities to model the services that a business or enterprise offers or requires. These capabilities are modelled in the Business Conceptual layer and represent what the business does (or needs to do) in order to fulfil its objectives and responsibilities.

The Business Capabilities are the top layer of the business architecture. They belong to a Business Domain and are governed by the Business Principles of the organisation. The capabilities are realised by a business process and performed by a role, i.e. an individual or team in the organisation.

The Business Capability is, therefore, at a higher level than a business process and is in the conceptual layer. It represents a conceptual service that a group of processes and people, supported by the relevant application, information and underlying technology, will perform. The capability represents the what, whereas the process and people represent the how.

Business Capabilities can themselves be broken down into supporting capabilities, if this is useful. For example, 'Order Fulfilment' is a high level capability that may be broken down into further supporting capabilities such as 'order approval', 'picking', 'packing', 'despatch', 'delivery' and 'returns management', as depicted in the figure below. These are all examples of capabilities, or of services, that an organisation needs to perform to enable it to fulfil its obligation to its customers.



You will find that your business capabilities are relatively static because you are defining the ‘what’ which rarely changes whereas, for example, your business processes will constantly be evolving as the ‘how’ things are done changes all the time with the advancement of technology and of customer demand. A very obvious example is retail – twenty years ago the internet did not exist so there were no online sales channels; but the capabilities of a retail channel have not altered, Sales, fulfilment and billing are still capabilities, however the process of ‘how’ they sell, dispatch and take payment has altered dramatically.

The level at which you model your business capabilities will depend on your objectives – why you are carrying out the modelling exercise. Sometimes it can be useful to use the capabilities to model the key value chain of the business - the key chain of capabilities, or services, that flow through your business. This is a subset of all the capabilities as it will not include any of the support functions such as IT or HR and is usually modelled at a fairly high level. It can be useful to highlight what the areas of most importance are to the business and to provide some focus. However, if a particular area has been identified as an area for change, you should focus on this area and model the capabilities down to the level where they meet the processes and people that support them. It depends on your objective at the time.

Before entering any information into essential, it is useful if you can identify all the capabilities in the area you are modelling up front, however, if you can’t do this it is ok to model incrementally and add the information as you get it. You will also need to understand which capabilities are supporting capabilities and which are contained capabilities, for example, ‘Order Fulfilment’ contains the ‘order approval’, ‘picking’, ‘packing’, ‘despatch’, ‘delivery’ and ‘returns management’ capabilities. In return, these are capabilities that support ‘Order Fulfilment’. It is easier if you ensure that you are aware of this structure before you start modelling.

3.4 STRATEGIC FORMULATION

Strategy formulation should depend on the development of strengths and opportunities. It includes examining the corporate or project mission by specifying achievable objectives. An organization's mission states the purpose for its existence.

Based on its e-commerce mission a company can formulate the objective of e-commerce. An e-commerce objective is the measurable goal that the company wants to achieve with e-commerce.

A first step is to establish a web site. Initial experiences from this can help determine future directions of development. A longer term e-commerce strategy must then be put in place based on the business aims and objectives within the constraints of feasibility.

3.4.1 Process of Formulating e-commerce Strategy

Organizations should develop a sound strategy to meet its goals and the following processes have been employed by successful e-commerce companies to develop their strategy:

Company should consider creating an independent e-commerce division or department with employees having specialist skills. A mixture of skills is needed. As well as the technical skills to implement the hardware and software required for e-commerce transactions, there will be a need for specialists in sales and marketing, purchasing, human resources, training, finance and business process re-engineering.

Companies should introduce e-commerce as a corporate culture as a top down led management initiative. This may require education and training of managers in the first instance so they understand the benefits (and risks) associated with e-commerce introduction.

The SWOT analysis should have identified the company's strengths. An ecommerce initiative needs to build on these strengths. The cost benefit analysis should enable managers to set targets and prioritize e-commerce activities to give the greatest opportunities for the earliest financial return with the minimum risk.

Companies should not underestimate the amount of business re-organization required to introduce e-commerce. These changes should, therefore, be harmonized with any other change initiatives the company is undertaking. The changes need to be seen as part of the company development and not as an add-on extra.

Companies need to consider whether they can carry out the development work themselves or whether they should subcontract part or all of this work. Who, for example, is going to design the website? How will the content be maintained and updated? Who will administer and control the system after it is installed? The company must consider whether it has the appropriate development resources and experience to build e-commerce systems or whether there are existing products that could provide the foundation of a new system.

During the planning stage you need to identify requirements for an Internet presence and should ask the below stated questions.

3.4.2 Designing the System

There are a number of considerations that must be taken into account at the earliest possible design stage.

How can an existing website be developed to maintain customer loyalty? The design should take into account the values the company wishes to promote, the image it wished to build and maintain, as well as the customer requirements of convenience and ease of use. There are both the long Term goals to be considered and the short-term stages needed to work towards the goals in a logical progression.

Who will process the credit card orders? Will e-commerce be employed to transmit credit card orders to the company's merchant account provider? The extent of e-commerce introduction can also depend on the company's partner organizations.

How will you get your order and fulfillment information into your accounting system? It is important to remember that a sale continues beyond the point of order. The e-commerce system needs to be able to handle the whole process.

How can you be sure that your data and that of your customers, suppliers and partners will be secure? This is an important technical issue that needs to be addressed from the outset. Without secure transactions, there will not be the customer confidence for the e-commerce system to succeed.

3.4.3 Some Pitfalls to Avoid during Planning

Companies need to ensure they do not

Neglect planning for customer service both before and after a sale.

Fail to integrate their e-commerce with their traditional business.

Fail to prepare for success and the volume of business it may generate, e.g. avoiding network traffic jams.

Underestimate the need to advertize the website and e-commerce facility.

Assume that the website interaction is the only aspect that will make the company different to its competitors – the underlying systems are equally important and must be developed from the outset to avoid failure.

Make hasty (and costly) decisions because of the pressure to get into the market as quickly as possible. It is important to react quickly but it cannot be done without a minimum of thought.

Neglect issues of scalability. If the company is successful it may have to grow its e-commerce business very quickly. It is important that the e-commerce system does not itself impose limits on growth.

3.4.4 Strategy Assessment

Like any other project, e-commerce projects need to be assessed during and after implementation. The objectives of strategic reassessment are:

To find out if the E-commerce system is delivering what it was supposed to deliver. A common pitfall is to think that selling over the web means the company must be making money over the web. This is not necessarily the case as Amazon has illustrated. A lack of profit in the beginning need not be a problem if it was part of the overall strategy. Amazon, for example, though they are not making money they do have a sound business plan.

To learn from both the successes and failures of the system reviewed. Whether the system is living up to expectations or not it should be possible to learn from mistakes and improve future planning. e-commerce is a continually changing environment so initiatives that work in the first instance may cease to be cost effective at a later stage.

To identify failing projects as soon as possible and determine the reasons for failures. There may be fundamental flaws in the original assumptions or outside changes may have completely altered the online market. There is no point in continuing with a project if it can't be saved. It is better to learn from the mistakes to avoid the same problems on subsequent systems.

Feedback and corrective actions to give a policy of continual improvement are needed for any development including e-commerce. For companies implementing an e-commerce strategy, a set of questions are given below which can be used as a checklist by the review team:

1. What were the aims and objectives for e-commerce? Were they met?
2. What were the expectations? Were they realistic?
3. What products and services did the company want to offer? Is the system delivering them? Can the proportion of offered services be quantified?
4. Have unanticipated problems occurred? If so, what proportion was handled successfully?

5. What costs did the company hope to reduce? What cost reductions were actually achieved?
6. Did other costs increase unexpectedly? If so, why? What extra costs were incurred?
7. What were the sales objectives were they realistic? How well were they obtained?
8. Did web and Internet communications reduce traditional communication costs, if so, by how much?
9. Did you improve customer relations? What evidence is there for this? If not what went wrong?
10. Have your suppliers provided adequate services? If not, what cost was incurred?
11. What internal issues have arisen? For example, has it had an effect on employees' resistance to change, cultural change etc? Can any problems be quantified?
12. Is your site making the best use of available technologies? How will you stay on top of online developments in your field? Are all appropriate staff involved and if not who else should be involved?
13. Does your web site effectively convey the image and message the company needs? Are there new media or public relations outlets that you could tap for further promotion?
14. What information has been gained from customer surveys, monitoring the use of the company web pages and sales made through e-commerce? Does this point to further opportunities for e-commerce expansion?
15. Does your business offer other services or customer support functions that you could provide online? If so what are the projected sales?
16. Are there further efficiencies that you could achieve by more effective electronic communication? If so what is the projected saving?
17. Could the company's database of electronic contacts be further extended and used more effectively for marketing? Note however, that care must be taken over privacy. The company should ensure it follows a clear privacy and ethical policy in all its use of customer data.

Many of the above questions involve quantification of answers. This helps identify the significance of the information revealed and this will then help prioritize future initiatives.

3.4.5 Review your Web Traffic Analysis

The electronic nature of a website means that information can be collected much more easily and effectively than it is for other types of commerce. In particular, it enables the following questions to be asked:

1. Are there any obvious patterns in the Internet traffic, or the paths the company's visitors follow that may give insights into their preferences or provide opportunities for further e-commerce growth?
2. What are the common routes users take through the website and what are the top exit points from your site? Are these appropriate? Can these be changed by better site design?
3. Which external sites link to you? Are these appropriate? How often are they used? Are you generating sufficient return on investment for paid for online advertising?
4. If you provide a website search facility, what are the most common search phrases and do they give any ideas for new areas of business development?

Finally it is important to track competitor's developments in the field. This can mean examining new competitors; in E-commerce it is not clear where your competition will come from as the nature of the Internet allows small companies and new companies to compete on level terms with larger, well established rivals. Because of the volatility of the old value chains, new services can be introduced by totally unexpected parties that become a competitor overnight.

The review of the e-commerce projects will then feed back to change and update the strategy and approach as is illustrated in Figure 3.1.

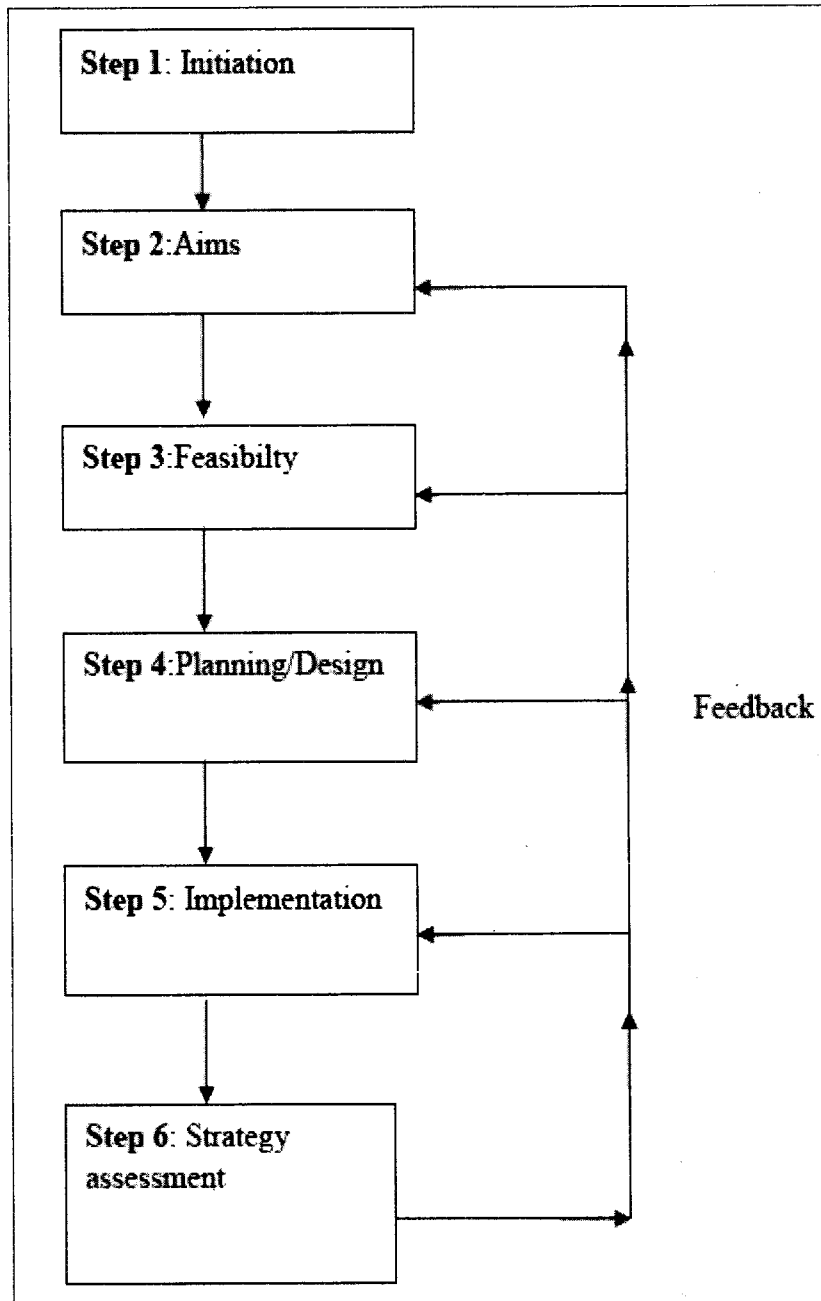


Figure 3.1: Showing steps used to Formulate e-commerce Strategy

3.5 IMPLEMENTATION PLANNING

Ideas, plans, and strategies are one thing – implementation is something entirely different, Jeff Bezos, of Amazon.com, claims that nothing Amazon.com does is very original – it just executes better than anyone else. In other words, strategy is nothing without implementation.

Many e-commerce implementations fail because they promise long term gain but no immediate benefits. Amazon.com, for example, has been trading for seven years and has still not made a profit though its projections are to do so in the future. It is, therefore, important to keep in sight the business transformation as well as the long term aim. Whenever possible, e-business projects should be divided into three to six month modules so that immediate benefit can be delivered with flexibility in the overall plan.

E-commerce is not an end state. It is a new business platform that will grow and evolve. To sustainable e-commerce success is to think and plan not just in terms of overall architecture, but act in incremental steps. For example, to manage risk, a company's very first e-commerce initiative might well be a simple "paper replacement" project to demonstrate the proof-of-concept in a well-controlled, internal environment. Processes are relatively untouched, with only the user interface being modified. In later increments the scope of the project can be expanded to include easily managed process changes.

Organizational and Cultural Issues

In order to have a successful e-commerce development it is necessary to have board level commitment, and support from all departments, people involved and stakeholders. Projects have been known to fail without such commitment. To put this "e-commerce culture" in place some education and training will need to be implemented before any further development is attempted.

As well as education on the benefits of e-commerce it will be necessary to introduce training on the business and technical issues of creating an e-commerce system. No one person can do everything, separate training will be required for the different disciplines of hardware, software, networks, marketing, finance, human resources and process reengineering in order to build the necessary competence team. Where necessary new staff will be required.

Once the staff is trained or hired the technical staff and operational managers can be involved in the decision process. To maintain the e-commerce culture this should continue throughout the development and operational life cycle.

Many of the advantages of e-commerce will be lost if it is implemented in isolation. It is important to involve suppliers and distributors. This involves spreading the ecommerce culture beyond the company boundary. However, if partner companies are willing it may be possible to cooperate in development work and training. It can be constructive to review current distribution and supply chain models used. It is necessary to examine the potential effect e-commerce will have on your current logistics. It is likely to be possible to increase the number of electronic connections, and as a consequence simplify inter-organizational processes with financial advantages for all concerned. The relationship with partner companies will need to be continually reviewed as other companies make and follow their own initiatives.

The SWOT analysis will have identified strengths within the company that may be usable in the e-commerce project. For example, if a company already has a good distribution network this may be the foundation for developing the e-commerce distribution.

It is necessary to identify and understand what your customers and partners expect from the Internet and from e-commerce. It is necessary to know how many customers are able and willing to interface over the electronic networks and conduct electronic transactions. This may require surveys and interviews to learn of customer attitudes.

Once the customer base is identified the company can build a close-knit community with its customers, encouraging customers to find out more about their products and services through message boards and emails. This builds the company's image. Also the more that can be found out about the customers, the more the products can be tailored to the customer, the less likely they will be to switch to another supplier. For example Tesco built its online image on products and services they offer. However, this will need to be an on-going activity throughout the development and operation of the system as customers needs and wants are changing as rapidly as the technology advances.

To take advantage of the on-line customer community a web centric marketing strategy needs to develop alongside the technical developments. Even if the current marketing strategy has taken the Internet into account, it is necessary to develop a marketing strategy that clearly targets the Internet as a primary marketing channel.

The technical issues of e-commerce implementation will also need to be continually reviewed throughout the system life cycle. The technology is moving at such a pace that it is likely that advantage can be taken of developments worldwide of technology and standards that were not available at the start of the project. It is advisable to build scalability and flexibility into the solution and to standardize wherever possible.

Security is a particular areas of concern it is critical to ensure that the company's systems keep up to date with expected standards of security, both within the organization and across all trading partners. It is also important to keep testing and retesting the e-commerce web site to ensure it remains compatible with the latest developments in Internet browsers on all common hardware and operating system platforms.

3.6 E-COMMERCE IMPLEMENTATION

E-commerce is a major element of competitive advantage in the modern business environment. In surveys that are conducted by a variety of companies indicate that an accelerating volume of transaction in Business-to-business (B2B) and business-to-consumer E-commerce. Business planning for moves their business function onto the internet face is a difficult task in selecting a partner that provide all the expertise and skills that required for successful business-to-business (B2B) or business-to-customer (B2C) e-commerce solution.

As a web development and Internet marketing company, Seo & Promotion has the experience to help your company provide its new vision. Our unique combination of e-marketing consulting, technical skills allows us to implement cutting edge database driven by commerce web sites that will provide help you to achieve your business goals. Recently a little research has been done on the process of e-commerce implementation. Especially in the implementation of business-to-business relationship. We describe the series of multiple case studies comprising ten major e-commerce initiators.

A large number of companies are deploying e-commerce implementation system to expand into new markets, increase customer satisfaction and loyalty and develop new streams. A business deploy an enterprise e-commerce system and one of the many variations which available in markets.

Today e-commerce deployment creates a virtual storefront enabling a company to display a company product and services it fulfils the requirement of order and business transaction 24 hour a day. e-commerce solution also provides the facility to an organization to participate in online communities and marketplace. It offers the opportunity to connect with large population of customer or clients with specialized interest.

Some technical considerations are common in E-commerce implementation and indeed to virtually any e-business application deployment. An E-commerce solution provides the return on investment, the application, the servers and the networks that works together.

Seo & Promotion specialize in creating E-commerce enabled web sites. We work hand in hand with our clients to develop E-commerce enabled websites that are successful. From web site design it is electronic storefront or an electronic catalog and back end transaction processing Seo & Promotion put it the entire piece together. We enjoy other important affiliations with major E-commerce software vendor.

3.7 EVALUATION OF E-COMMERCE

There have been several key steps in the history of e-commerce.

In late 1970s – Electronic Data Interchange (EDI) and Electronic Funds Transfer (EFT) introduced.

1980-1990 – Credit Card, ATM, Tele-banking was introduced.

1984 – the ASC X12 standard became stable and reliable in transferring large amounts of transactions.

In 1990s – ERP, Data warehousing, Data Mining Started.

1990 – First web browser was written.

1992 – The Mosaic web-browser was made available; it was the first ‘point and click’ browser.

The development of DSL was another key moment in the development to of e-commerce. DSL allowed quicker access and a persistent connection to the Internet.

1994 – Netscape released the Navigator browser in October under the code name Mozilla.

Pizza Hut offered pizza ordering on its Web page.

The first online bank opened.

In late 1994 – Netscape 1.0 introduced SSL encryption that made transactions secure.

1995 – Amazon.com and eBay was founded.

1998 – AOL had sales of 1.2 billion over the 10 week holiday season from online sales.

The development of Red Hat Linux was also another major step in electronic commerce growth.

Electronic postal stamps can be purchased and downloaded for printing from the Web.

1999- Napster was launched.

In early 2000, a major merger between AOL and Time Warner was another major push for electronic commerce.

In February 2000, hackers attacked some major players of e-commerce, including Yahoo, ebay and Amazon.

Check Your Progress

Fill in the blanks:

1. The company should focus its into areas where it gives more return on investment.
2. from the initial web site can help the company determine whether it wishes to further develop the facility and whether to take the step of buying and selling over the Internet.
3. A detailed study should be carried out to identify critical success factors.

3.8 LET US SUM UP

"In assessing the strategic implications of information technology for the next three years within any company or enterprise, senior executives need to realize that there are significant new developments that are fundamentally changing how teams collaborate, and how companies accomplish their objectives. Understanding the capabilities required by your business provides a high level overview of the business and can be a very useful exercise as it allows one to take a step back and focus on what the key elements of the business are. Based on its mission a company can formulate the objective of E-commerce. An E-commerce objective is the measurable goal that the company wants to achieve with E-commerce. Organizations should develop a sound strategy to meet its goals. Company should consider creating an independent E-commerce division or department with employees having specialist skills. Companies should introduce E-commerce as a corporate culture as a top down led management initiative. The SWOT analysis should have identified the company's Strengths, Weaknesses, Opportunities and Threats. Companies should not underestimate the amount of business re-organization required to introduce E-commerce. E-Commerce is not an end state. The SWOT analysis will have identified strengths within the company that may be usable in the E-commerce project. This builds the company's image. E-commerce is a major element of competitive advantage in the modern business environment.

3.9 KEYWORDS

Business Capability: Understanding the capabilities required by your business provides a high level overview of the business.

Strategic Planning: It clarifies what an E-commerce project should do or focus on, with respect to the company's mission and the given business environment.

SWOT Analysis: Strengths, Weaknesses, Opportunities and Threats Analysis.

3.10 QUESTIONS FOR DISCUSSION

1. Explain the processor to understand the business capability.
2. How a company can make strategy for e-commerce?
3. Why a company needs to consider what role it requires for the web site?

4. How the web can be incorporated into existing lines of business, supply and channels of distribution for a company?
5. Why the company needs to carry out a full SWOT analysis?
6. What is the process of formulating e-commerce strategy?
7. Why e-commerce projects need to be assessed during and after implementation?

Check Your Progress: Model Answer

1. re-engineering
2. Experiences
3. feasibility

3.11 SUGGESTED READINGS

Robert T. Plant, *eCommerce: Formulation of Strategy*, Prentice Hall (2000)

Janice Reynolds, *The Complete E-Commerce Book: Design, Build and Maintain a Successful Web-Based Business*, CMP Books (2004).

Ravi Kalakota, Andrew Winston, *Frontiers of Electronic Commerce*

P.T.Joseph, *e-Commerce – A Managerial perspective*

G.Winfield Treese & Lawrence C.Stewart, *Designing Systems for Internet Commerce*

Kamelesh K Bajaj, Debjani Nag, *e-Commerce The Cutting Edge of Business*

Dr.Ravi Kalakota, Marcia Robinson, *E Business Road Map for Success*

LESSON

4

CASE STUDIES

CONTENTS

- 4.0 Aims and Objectives
- 4.1 Introduction
- 4.2 Airline Booking System
- 4.3 Web Booking System
- 4.4 Competitive Outcome
- 4.5 Let us Sum up
- 4.6 Keywords
- 4.7 Questions for Discussion
- 4.8 Suggested Readings

4.0 AIMS AND OBJECTIVES

After studying this lesson, you will be able to:

- Explain the airline booking system through a case study
- Discuss web booking system
- Describe the competitive outcome of e-commerce

4.1 INTRODUCTION

Examples of e-commerce transactions are:

- An individual purchases a book on the Internet.
- A government employee reserves a hotel room over the Internet.
- A business calls a toll free number and orders a computer using the seller's interactive telephone system.
- A business buys office supplies online or through an electronic auction.
- Retailer orders merchandise using an EDI network or a supplier's extranet.
- A manufacturing plant orders electronic components from another plant within the company using the company's intranet.
- An individual withdraws funds from an Automatic Teller Machine (ATM).

Identifying e-commerce transactions often is not as straight forward as the previous examples may make it appear.

4.2 AIRLINE BOOKING SYSTEM

An Airline Reservation System is part of the so-called Passenger Service Systems (PSS), which are applications supporting the direct contact with the passenger. The Airline Reservations System (ARS) was one of the earliest changes to improve efficiency. ARS eventually evolved into the Computer Reservations System (CRS). A Computer Reservation System is used for the reservations of a particular airline and interfaces with a Global Distribution System (GDS) which supports travel agencies and other distribution channels in making reservations for most major airlines in a single system.

Case Study: Vaganga – Bringing Online Airline Booking System to South America

Challenge

There are few Web sites that use direct services from Sabre, Amadeus, or Galileo. Most of these sites support ASP.net and Java, which excluded PHP. Vaganga requested PHP due to its long term cost-saving advantages.

The project needed services directly from Sabre, unlike many sites out there that collect data from other travel sites. Xillent's challenge was to create the Sabre connection in PHP and conform with Vaganga's current business model.

An important request from Vaganga was to have multiple-language support. This allows the user to toggle between languages, and helps Vaganga expand into a global market. It's important to note that Xillent had no experience working with South American API development in a foreign language. Xillent created a framework that allows said challenge and has the ability to be easily updated to meet the growing company's future needs.

The client also requested an automated hotel registration tool using a highly customized calendar system with a highlighting capability. The highlighted regions and shading represent pricing, vacancy, and other attributes. The end result is comparable to Google's calendar.

Solution

Xillent created a new PHP-based programming platform. Some of Xillent's key accommodation for the new framework included direct Sabre integration, multi-language support, model-view control, tight JQuery Ajax capability and advance caching.

With the new structure that allows a tight JQuery integration, Xillent completed the hotel calendar within a week for demo.

Result

The structure of the framework takes into consideration any project that requires a clean organization of the files in a coherent structure. The outcome is a reduced debugging time for any developer who has not worked with the code before. This literally means a reduction of maintenance cost and quicker development time.

The backend of Vaganga utilizes Xillent SiteManager (TM) Content Management System. This allows Vaganga admins to go in and change the global settings and edit the content of its portal. The solution results in a light application running highly-complex services.

Technical Notes

Xillent implemented PHP, MySQL, custom-Web platform and a custom SiteManager (TM) CMS system.

4.3 WEB BOOKING SYSTEM

Computer Reservations Systems (CRS), originally designed in the mid-1960 to handle ticket transactions by airlines, were later extended for the use of travel agents; major CRS operations that book and sell tickets for multiple airlines are known as Global Distribution Systems (GDS). Airlines have divested most of their direct holdings to dedicated GDS companies, who make their systems accessible to consumers through Internet gateways. Modern GDSes typically allow users to book hotel rooms and rental cars as well as airline tickets.

However, the diversity and the specifics of the tourist products are mandatory by the definition of utilities used to offer and conduct such transactions. For example, sales of combined tours must be handled according to a different sale model than mass direction. Furthermore, small travel agencies and individual travel agents do not usually need the services provided by full scale booking systems in their entirety; they need functionality which is tailored to solve the purpose-specific demand of the customer.

With the advent of modern travel technology and e-tourism having a convenient mechanism for order, discount and commission, which is supported by dedicated OBS provider, became an apparent prerequisite for development of locally rooted travel industries.

Case Study: Joint Automated Booking System (JABS)

Situation

The U.S. Department of Justice's (DOJ) law enforcement agencies need to book criminal offenders. A single arrest may involve as many as three agencies, during which the arresting agency, then the detaining agency, then the incarcerating agency may, for the same offender, photograph, fingerprint, and record biographical data.

Prior to JABS, booking data were captured on paper and in systems accessible by only one agency, making it difficult to share information among federal law enforcement components. In USDOJ Components without a data system for recording bookings, storing, managing, and retrieving such information was inefficient. For example, information sent to the Federal Bureau of Investigation (FBI) for identification purposes was sent by mail on hard-copy forms, and the response from the FBI could take several weeks.

A client-server version of JABS was implemented and initially deployed in 1999. The success of JABS resulted in over 800 deployed sites across the country by 2004. However, the technical architecture of a client-server implementation came with inherent drawbacks. The JABS PMO quickly realized that the effort and cost associated with deploying and maintaining so many sites was prohibitive.

SPS – Problem Solved

DOJ awarded SPS a competitive contract to design, develop, and deploy a web-based JABS architecture, including a web browser-based booking station capability, to serve as the platform for future improvements. The new architecture was to allow changes to be made to the JABS application from a server site, rather than having to make changes to several client sites.

SPS implemented a 3-tier software architecture that divided the application into three tiers: Presentation or User Interface Tier, Business Logic Tier, and Database Manipulation Tier using a Model-View-Controller (MVC) design pattern. A JABS ABS workstation was designed and developed using the Aware Accuscan, NISTPack Sequence Check, and Accuprint developer toolkits in combination with internally developed web pages and client software to interface to and integrate with COTS components. SPS developed a data administration sub-system to manage user access and audits, and a query sub-system to provide extensive search capability functions to all participating agencies.

Methodology

Development methodology followed the DOJ System Development Life Cycle processes and standards, appropriately modified in consultation with the JABS program management office. The SDLC emphasizes artifact preparation and quality control as embedded activities, greatly facilitating clear linkage between requirements and implementations, and effective client review and guidance.

SPS designed and developed the system using a component-based design and J2EE session beans to set the foundation for a service-oriented architecture. The advantage of this approach is that a component can interface with other J2EE components using the J2EE protocols and not incur the overhead of SOAP and XML processing, and at the same time be loosely integrated with external systems using XML. This also reduces redundant code without comprising performance.

Lessons Learned

A comprehensive integrated development environment, including system configurations closely matching systems to be deployed, substantially reduced changes late in the development cycle. Deployed systems were essentially error free.

Cooperative and productive interactions with other JABS contractors requires a substantial degree of formalism and "bipartisan" commitment to mutual success.

Results

The JABS migration was accomplished within schedule, budget, and technical strategy set forward in the Statement of Work. The new web-based version, JABS 3-Tier Version 3.0, received certification and accreditation to operate in June 2004. By spring 2004, the Bureau of Alcohol, Tobacco and Firearms (ATF) had requested that workstations be installed in an estimated 146 offices, and by November 2004, the ATF had 37 sites connected to JABS.

Client Benefits

The client now has a system that demonstrates a highly secure, flexible, and scalable Java information technology solution with interfaces to peripherals and hardware, capable of capturing biometric information requirements.

About SPS

Software Performance Systems, Inc. (SPS), a small business based in Maryland, is a privately held information technology services provider. Established in 1995, SPS specializes in the design and integration of large Web-based solutions for State and Local Governments and commercial clients. SPS has been honored with many national awards, including: 10 ranking in the Computerworld Top 100 Best Places to Work in IT, Deloitte's Virginia Technology Fast 50 and North America Technology Fast 500, and as a SBA Exporter of the Year. More importantly, SPS solutions helped our clients win prestigious awards, including the Grace Hopper Federal Government Technology Leadership Award, the E-Gov Pioneer Award, the Excellence.gov Grand Prize Award, and the Government IT Agency Award for Excellence in Government.

4.4 COMPETITIVE OUTCOME

Competitive outcomes collaborates with industry, government, and education partners to create workforce development strategies that serve as catalysts for economic development. These strategies and related infrastructure are needed to create and sustain 21st Century knowledge-economy sectors. One of the biggest challenges facing companies in these sectors – many of which are highly-regulated – is having a workforce pool with the required specialized skills sets. Without this workforce pool, advanced industries such as biotechnology, aerospace and others cannot be established, grow or be competitive in a global economy. We work with industry, government and education to put in place the programs, initiatives and infrastructure in a cost-effective manner so that new economic development can occur for a competitive outcome in the global economy.

Case Study: Walmart.com

Wal-Mart's online experience is proof that success in the brick and mortar world doesn't create corresponding success in e-commerce.

Offline, Wal-Mart is a sprawling giant, the world's largest retailer. Its U.S. stores number 3,300 and it employs more than one millions workers, which means about one out of every 300 Americans is a Wal-Mart employee.

"It's a real category killer," claims Gartner research director Geri Spieler, who says that that Wal-Mart's success is "what everyone is trying to compare to." Leveraging that success, Wal-Mart insists that any company that wants to be a supplier use the Wal-Mart EDI (electronic data interface). So Wal-Mart can replenish its stock - straight from wholesalers – faster than you can say "discount retail."

And the giant is getting bigger, Spieler says. Wal-Mart is expanding its line to include designer clothes like those sold in Old Navy, and building its new stores with the capacity to offer more groceries. Wal-Mart plans on opening 70 new supercenters in 2003.

The company markets like the behemoth it is. According to Wal-Mart spokesperson Cynthia Lin, the company mails 90 millions copies of its ad circular every month – meaning it's probably one of the most widely circulated publications in America.

But Online

Wal-Mart's dominant place in offline retail might be expected to provide it with top dog e-commerce status. But analysts say Walmart.com is distinctly back of the pack in terms of total online sales, and a list of traffic figures for leading e-commerce sites released by comScore Media Metrix for September supports this.

At the top is e-commerce wunderkind eBay, with 34.4 millions visitors, followed closely by Amazon (the site most closely resembling Walmart.com) with 25.6 millions visitors.

Working down the list, Yahoo Shopping had 24.5 millions, Dell had 11.4 millions, Barnes and Noble had 8.2 millions, and MSN Shopping had 7.3 million.

Down at 13, with 6.5 millions visitors, is Walmart.com. A respectable showing, to be sure, but anemic considering that the company has been a household name for decades, and that Walmart.com has been selling online since July 1996.

Different Customer Base

Wal-Mart's offline retail success isn't replicated online because, says Spieler, "that's not where their customer base is."

She notes the typical online shopper is a very different creature than the typical Wal-Mart customer. "People who shop at Wal-Mart like to go to the store," she says. "Wal-Mart caters more to people with large families and people who aren't in much of a hurry."

The average online shopper tends to have greater expendable income and place more emphasis on saving time, she says. Many online shoppers fall into the "time-stressed" category of baby boomers that like having items delivered.

As for the other reason that Walmart.com isn't an online leader, Spieler echoes a sentiment voiced by many e-commerce analysts. In general, she says, the members of the retail segment are "technology laggards." "They're not as techno savvy as their Web sites would have you believe."

Spin Off Returns

Indeed, Wal-Mart, like many companies, has had its share of challenges in its online operations. In the 1999 holiday season, it had to warn consumers that it could not guarantee delivery of orders placed after December 14th - unusual for a retailer with such well developed infrastructure.

Wal-Mart, seeking greater online expertise, spun Walmart.com off as a separate company, selling a minority stake to tech-savvy Accel Ventures in January 2000, moving the site's headquarters to Silicon Valley.

But, in what was widely seen as an unusual tactic, Walmart.com shut down for a month in the fall of 2000 to revamp the site. That a major e-tailer would shut down its site in a holiday ramp-up period, instead of readying a platform beforehand, left some industry observers puzzled. (And the site still had numerous hour-long black outs after it came back online.)

In 2001, Wal-Mart bought back Accel's minority stake, so Walmart.com is once again a wholly owned subsidiary of Wal-Mart. Lin explains that the buy back was due to Wal-Mart's desire to focus on integrating its online and offline sales channels.

Gartner's Spieler is of the opinion that Accel wasn't doing a good job with it. But, whatever the reason, Walmart.com, with or without outside help, appears to have a strategy for moving the site forward.

A Hint of Hipness

Certainly, the Walmart.com site would never be described as high tech. It still lacks the customer personalization features used by Amazon, and its straightforward blue and white design gives it a dowdy look.

Yet it does have a touch of trendiness. Walmart.com recently launched a Netflix-style DVD rental plan. Users order DVDs through the site and receive them in the mail, keeping them as long they want with no late fees.

Considering that Netflix itself has yet to make turn a profit, Walmart.com's new venture is forward looking. And in true discount fashion, Walmart.com is undercutting Netflix's price by about a dollar.

The site also offers Internet access. For \$9.94 a month, you can buy unlimited dial-up service through Wal-Mart Connect, which is AOL service offered with the Wal-Mart brand. But the site slashes AOL's price in half by offering a bare bones ISP client without bells and whistles like instant messaging and e-mail filters.

Real Secret

The giant discounter's true strength online is in its bricks 'n clicks integration, tying its Web site into its real world stores. "We recognized that one of the greatest values is in integrating the online and offline channel," says Wal-Mart's Lin.

You can, for example, chose replacement tires at Walmart.com and have them installed at a local Wal-Mart. The site's pharmacy section lets you place an order to be picked up locally; you can also view your prescription history online and set up e-mail reminders for refills. The site's vision center offers a similar service for contact lenses.

You can drop off photos to be developed at Wal-Mart and see the finished prints at Walmart.com, where you can e-mail them to friends or make them into gift cards. If you buy an item at Walmart.com, you can return it at a local Wal-Mart.

If there's an item your local Wal-Mart is out of, it's likely that the site has it. Walmart.com stocks 500,000 books and 80,000 CDs, not to mention replacement lawn mower blades, hot tubs, women's shoes, and Harry Potter Lego sets. Though the site doesn't release inventory figures, it's probable that it has the largest inventory of any retailer, online or off.

With the power of this integration, leveraging its massive offline presence to compliment its e-commerce operation, it may not matter that Walmart.com lags its online rivals. It is, after all, an effective part of an overall retail operation that is expected to generate \$218 billions in revenue in 2002 (to put that in perspective, Microsoft's expected revenue is a paltry \$28 billions). With a jaw-dropping revenue figure like that, Wal-Mart can afford to take its time in growing its online market share.

Check Your Progress

Fill in the blanks:

1. An Airline Reservation System is part of the so-called
2. Computer Reservations Systems (CRS), originally designed in the mid-1960 to handle ticket transactions by
3. Competitive Outcomes collaborates with industry, government, and education partners to create strategies that serve as catalysts for economic development.

4.5 LET US SUM UP

An Airline Reservation System is part of the so-called Passenger Service Systems (PSS), which are applications supporting the direct contact with the passenger. Computer Reservations Systems (CRS), originally designed in the mid-1960 to handle ticket transactions by airlines, were later extended for the use of travel agents; major CRS operations that book and sell tickets for multiple airlines are known as Global Distribution Systems (GDS). Competitive Outcomes collaborates with industry, government, and education partners to create workforce development strategies that serve as catalysts for economic development.

4.6 KEYWORDS

PSS: Passenger Service Systems

GDS: Global Distribution Systems

CRS: Computer Reservations Systems

EDI: Electronic Data Interface

OBS: Online Booking System

4.7 QUESTIONS FOR DISCUSSION

1. Explain airline booking system with a case study.
2. Explain web booking system with a case study.
3. Explain competitive outcomes with the help of a case study.

Check Your Progress: Model Answer
--

- | |
|---|
| <ol style="list-style-type: none">1. Passenger Service Systems2. airlines3. workforce development |
|---|

4.8 SUGGESTED READINGS

Robert T. Plant, *eCommerce: Formulation of Strategy*, Prentice Hall (2000)

Janice Reynolds, *The Complete E-Commerce Book: Design, Build and Maintain a Successful Web-Based Business*, CMP Books (2004).

Ravi Kalakota, Andrew Winston, *Frontiers of Electronic Commerce*

P.T.Joseph, *e-Commerce – A Managerial perspective*

G.Winfield Treese & Lawrence C.Stewart, *Designing Systems for Internet Commerce*

Kamelesh K Bajaj, Debjani Nag, *e-Commerce The Cutting Edge of Business*

Dr.Ravi Kalakota, Marcia Robinson, *E Business Road Map for Success*

UNIT III

LESSON

5

BUSINESS-TO-BUSINESS E-COMMERCE

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- 5.0 Aims and Objectives
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- 5.2 Inter-organizational Transactions
- 5.3 Electronic Market
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 - 5.3.2 Impact of Electronic Markets on Industry Structure
 - 5.3.3 Traditional and Electronic Markets: Buyer Cost Perspective
 - 5.3.4 Traditional and Electronic Markets: Seller Cost Perspective
 - 5.3.5 Revenue Source Implications
- 5.4 Advantages and Disadvantages of e-market
- 5.5 Advantages and disadvantages of e-markets in Future
- 5.6 Electronic Market in Future
 - 5.6.1 Inhibitors to Electronic Market Success
 - 5.6.2 Contributors to Electronic Market Success
- 5.7 Let us Sum up
- 5.8 Keywords
- 5.9 Questions for Discussion
- 5.10 Suggested Readings

5.0 AIMS AND OBJECTIVES

After studying this lesson, you will be able to:

- Explain the concept business to business electronic commerce
- Discuss inter-organizational transaction
- Describe the electronic markets
- Identify and explain the advantages and disadvantages of electronic market
- Discuss the advantages and disadvantages of electronic market in future
- Explain the electronic markets in future

5.1 INTRODUCTION

B2B indicates to the full spectrum of E-commerce operation that can occur between two organisations. Among other activities B2B E-commerce include purchasing and procurement, supplier management, inventory management, channel management, sales activities, payment activities, payment management and service support example Chandex (www.chandex.com), Fast parts (www.fastparts.com).

In this lesson we survey the economic impact of electronic markets (e-markets). We identify and analyze examples of e-markets, the impact of e-markets on the structure of industries, buyer and seller cost differences for traditional and electronic markets, revenue source implications for sellers and transaction intermediaries, and determinants of e-market success. The overall issue addressed is whether there are economic incentives for electronic markets, or are they just a passing fad?

5.2 INTER-ORGANIZATIONAL TRANSACTIONS

One issue that is restricting the acceptance of Web EC is that the Internet is not a particularly good platform for managing the integrity or security of high-volume EC transaction processing. The Internet offers no control over state management to understand when a transaction begins, fails, or completes, and currently the Net suffers bandwidth problems even without any significant business-to-business transaction processing taking place.

Although many options are available, such as the Secure Electronic Transaction (SET) or VeriSign's digital identification technology, there is no single commercially accepted standard for authenticating participants in a transaction or for securing and encrypting transactions.

Similarly, no commercial standard exists for packaging data and mapping the data between heterogeneous business applications. The whole concept of workflow management across the Web is in its infancy. Establishing standards in these areas will take serious collaboration between the software industry and the business world - not atypical behavior to date.

Even existing EC "standards" in the areas of EDI and EFT leave much to be desired. EFT formats differ from country to country, so software vendors often just custom-build EFT formats on demand. EDI has not become pervasive in the business community despite the fact that many Fortune 1,000 enterprises – such as General Electric Corp. – demand that their major business partners interact with them using EDI.

Although the Internet reduces the cost of routing EDI transactions when compared to traditional VANs, EDI data-mapping capabilities are not integrated into many business applications and, instead, are optional third-party add-ons that are supplied by specialized EDI software vendors.

To secure its place in the world of Web EC, EDI must become the *de facto* transaction import/export format in business-process management applications, just as the Lotus and Excel spreadsheet or Word and WordPerfect document formats are between desktop applications.

Inter-organizational Transaction Steps

The EDI transaction for a purchase, shipment and payment normally follows the following steps:

- Step 1 Buyer's computer send purchase order to seller computer
- Step 2 Seller's computer sends purchase order confirmation to buyer's computer

- Step 3 Seller's computer send booking request to transport company's computer
- Step 4 Transport company's computer sends booking confirmation to seller's computer
- Step 5 Sellers computer sends advance ship notice to buyer's computer
- Step 6 Transport computer sends status to seller's computer
- Step 7 Buyers computer sends receipt advice to seller's computer
- Step 8 Sellers computer sends invoice to buyer's computer
- Step 9 Buyers computer sends payment to sellers computer

5.3 ELECTRONIC MARKET

Exchange of information, products, services and payments using Internet, networks and digital knowledge, e.g. prices, purchase orders, invoices, shipping notices is called the electronic market. Commercial transactions have taken place for centuries, but currently there is a revolution taking place that is transforming the marketplace. This transformation is occurring because the relationship between organizations and consumers is increasingly being facilitated through electronic information technology (IT). This is generally referred to as electronic commerce (e-commerce), with a major component of e-commerce being electronic markets (e-markets). The number of products available online is growing steadily, but not enough is understood about this rapidly evolving phenomenon. In 1996 the number of losers exceeded the number of winners by 2 to 1 for Internet commercial ventures (Rebello *et al.*, 1996). A question that arises from the current growth of electronic markets is whether there are economic incentives for buyers and sellers to participate in them, or whether they are a passing fad. The purpose of this lesson is to address this issue.

Past work has focused on the academic relationship, usually based on transaction cost economics analysis (Williamson, 1985), between IT and transaction governance (markets vs. hierarchies) (Bakos, 1991; Benjamin and Wigand, 1995; Gurbaxani and Whang, 1991; Malone *et al.*, 1987; Malone *et al.*, 1989; Malone and Rockart, 1991). Our study involves a cost-based economics analysis similar to previous work, but we compare traditional markets with electronic markets instead of markets with hierarchies. Williamson states that the economic institutions of capitalism (namely markets and hierarchies) have the main purpose and effect of economizing on transaction costs (Williamson, 1985). Our thesis is that, in many instances, electronic markets enjoy transaction cost advantages over traditional markets. Because of these transaction cost advantages we can expect a continued growth in online markets in many industries.

5.3.1 Electronic Markets: Description and Examples

The shift toward electronic commerce is innovatory because it involves linking consumers to electronic marketplaces, not just electronically supporting hierarchical transactions within and between organizations (commonly referred to as the problem of enterprise integration). The involvement of consumers, in addition to product/service providers, dramatically increases the potential magnitude of change. A significant portion of the GDP is consumer transactions. As of the fourth quarter of 1997, more than 66% of the GDP was personal expenditures (Stat-USA, 1998). Past growth in enterprise integration systems missed these transactions. The revolutionary nature of electronic commerce provides adequate incentive to study electronic markets to increase our

understanding of their impact on the market's participants, traditional and newly created industries, as well as the economy as a whole.

Electronic Market Description

Electronic markets are the foundation of electronic commerce. They potentially incorporate advertising, product ordering, delivery of digitizable products, and payment systems. An electronic marketplace (or electronic market system) is an interorganizational information system that allows the participating buyers and sellers to exchange information about prices and product offerings. The firm operating the system is referred to as the intermediary, which may be a market participant – a buyer or seller, an independent third party, or a multi-firm consortium (Bakos, 1991). E-markets provide an electronic, or online, method to facilitate transactions between buyers and sellers that potentially provides support for all of the steps in the entire order fulfillment process. The business process model from a consumer's perspective consists of activities that can be grouped into three phases: prepurchase determination, purchase consummation, and postpurchase interaction (Kalakota and Whinston, 1996). Each of these phases can be supported electronically in a complete e-market, but e-markets today generally support only the prepurchase determination activities, although they are moving toward more purchase consummation.

Electronic Market Examples

A number of electronic markets are obtainable to consumers to buy products ranging from music CDs to automobiles. The following are current examples of products and/or services that are available through electronic markets.

- **Flowers:** Calyx & Corolla have used e-commerce to fundamentally alter the way new cut-flowers are moved from the growers to the consumers. Traditionally, the value chain that supplied cut flowers involved a grower, jobber to transport to a wholesaler, and finally a florist. From a survey of Boston florists in July 1995, the price, including delivery charge and tax, for an example arrangement of flowers was \$60. Calyx & Corolla are able to provide an electronic market to customers to buy directly from growers with the flowers being shipped using Federal Express. Their delivered price is \$54 (Applegate *et al.*, 1996). Much of this is due to the elimination of some of the intermediaries between the growers and the customers. The price paid to the firm providing the electronic market is generally lower than the profits made by the traditional wholesaler and retailer intermediaries.
- **Clothing:** Similar to the cut-flower example, is an instance in the shirt industry. The cost per high quality shirt in a value chain that includes a wholesaler and retailer is \$52.72. The elimination of these intermediaries reduces the cost to \$20.45, a reduction of 62% (Benjamin and Wigand, 1995).
- **Automobiles:** Gratitute to the World Wide Web, new car shoppers have more options, including access to valuable information, such as what a car really does cost a dealer. As a result, consumers are increasingly locking in better deals online. What's more, the trend has attracted the attention of some of the biggest car dealers, financial institutions and insurance companies. Electronic markets now exist than enable consumers to shop for and buy a new car, insure it and take delivery without ever setting foot in a dealership (Calem, 1996). A search of the directory of automobile dealers on Yahoo in late 1996 showed that 79 different dealers or locator services were listed (Yahoo).

- **Music:** Jason and Matthew Olim established CDnow Inc. from the basement of their Ambler, Pennsylvania home. Jason Olim, a jazz fan frustrated by skimpy selections in music shops, came up with the idea of a cyberstore that could offer every jazz album made in the U.S. and 20,000 imports. Shoppers place their orders with CDnow (cdnow.com), which, in turn, contacts distributors. Most disks are delivered to the customer's door in 24 hours. Add in advertising revenues, and CDnow expects to hit \$6 millions in sales in 1996, triple the previous year's revenue, with 18% operating margins (Rebello *et al.*, 1996).
- **Books:** Books are one more product that consumers purchase online. One bookseller on the Web is Amazon.com Books. Their site advertises a spotlight book, book of the day, titles in the news, featured books, and books that are hot this week. Some of their books are discounted as much as 30%. By clicking on book titles, and some authors, more detailed information can be accessed (Amazon). It is no longer necessary to either go to a bookstore to buy a book or to find mail order bookstores through a print advertisement. Also, Web advertising is likely to be more current than print ads.
- **Electronic Magazines (E-zines):** With no printing or transmission costs, online magazines once held the promise of low overhead and quick profitability. Now most Web publishers have amended their business models and expect years of losses before turning a profit - a model much closer to print publications. Though analysts and publishers expect mainstream advertisers to up their antes in Web ads, most e-zines are exploring alternative ways of making money in the short term, including sponsorships, alliances and even subscriptions. Most online publishers have a rosy outlook now that the Internet has become a media focal point and mainstream advertisers better understand the Net. Jupiter Communications, a New York-based Internet research company, predicts that the total number of online consumers will jump from 13 millions in 1996 to more than 35 millions in 2000. Adam Schoenfeld, vice president and senior analyst at Jupiter, said that the universe of ad dollars online - both on the Web and on dedicated online services - would grow to \$5.3 billions by 2000 (Glaser, 1996). A growing number of online consumers, as well as a growing amount of Net based ad money, provides an environment where electronic magazines with good content may flourish in the future.
- **Airline Tickets:** Discount airfares you won't find wherever else are popping up on the Internet. American Airlines and Cathay Pacific Airways are using their Websites to reduce the thousands of seats that are unsold on flights every day. American began selling fares on 20 routes as much as 70% below the lowest fares consumers would be quoted through a travel agent or American's 800 number. Besides filling empty seats, airlines want to cut distribution costs by selling directly on the Internet instead of through travel agents (Rosato, 1996).
- **Stock and Securities:** All of a sudden, novelty in technology, particularly the Internet, are bringing profound changes to Wall Street that hold a lot of promise, and a lot of peril, for the powerful firms that make their money in the securities business. For many people, the Internet could replace the functions of a broker. For example, almost a dozen small companies are trying to sell their stock directly to the public using Websites like those run by Direct Stock Market and IPO Data Systems. And two small California companies, Real Goods Trading and Perfect Data, have set up electronic bulletin boards that allow their shareholders to trade stock without a broker, dealer or market maker. Because it allows traders to find each other easily, the Internet may ultimately make it possible to have a stock exchange that exists only in cyberspace, with no trading floor, directly open to every investor with a computer and a modem (Eaton, 1996). Three sets of issues and research

questions arise from an analysis of these examples. First, what is the impact that electronic markets have on the costs relevant to a consumer's choice between traditional retail markets and electronic markets? Second, what is the impact that electronic markets have on seller costs, as well as the structure of the value chains needed to provide products? And third, what impact do electronic markets have on other organizations involved in commercial market transactions? These three issues are addressed throughout the remainder of this lesson.

5.3.2 Impact of Electronic Markets on Industry Structure

It is apparent from the examples above that the dispersal of electronic markets in an industry has a brunt on the structure of the value chain involved in supplying the products and/or services to the final consumers. This is mainly due to the disintermediation effect of information technology identified by Davenport in his research on business process re-engineering (Davenport, 1993). Although, in some instances, intermediaries may be added to transactions facilitated through an electronic market. Based on the examples above we have identified two phases that industry structures potentially go through as electronic markets diffuse across the industry. The degree of change is determined by features of the industry and its products. This is discussed in more detail at the end of this section.

An example of a traditional market is shown in Figure 5.1. The industry transformation phases are described in relation to this example.

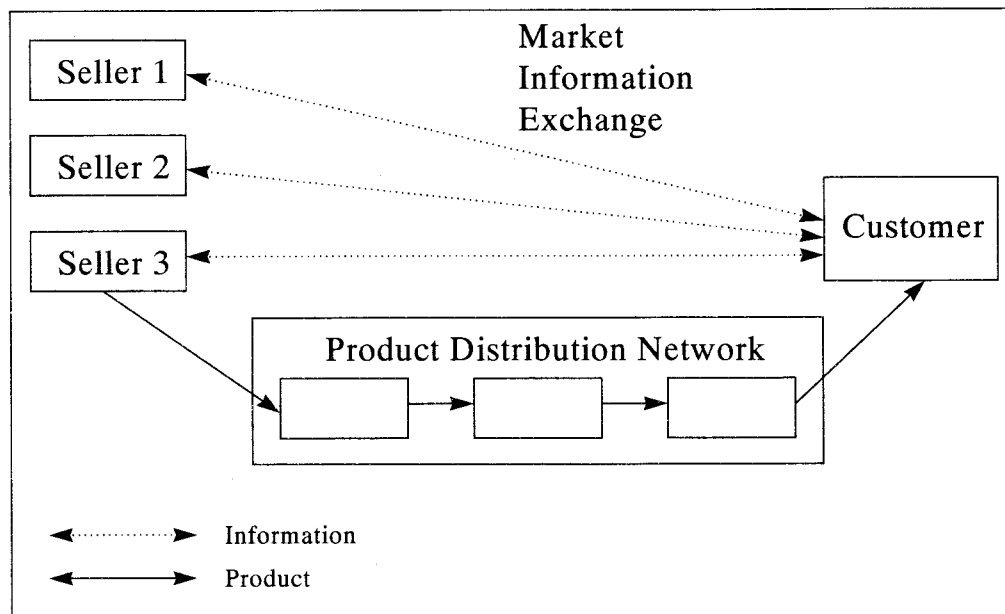


Figure 5.1: Traditional Market Industry Structure

In a customary market (for a non-impulse purchase), the customer searches out information about the products obtainable and their prices, quality and features. This information comes from a wide range of sources including advertising, traveling to retail stores, and so forth. At some point they stop their search because they realize further searching will probably not benefit them. Once the information gathered has been analyzed, the consumer decides where to buy the product. The product is then either purchased and transported home by the customer or is delivered to them through a distribution network.

Electronic markets influence the consumer purchase process. The first phase in the transformation of the structure of an industry is the digitization of the market mechanism. This is described in Figure 5.2.

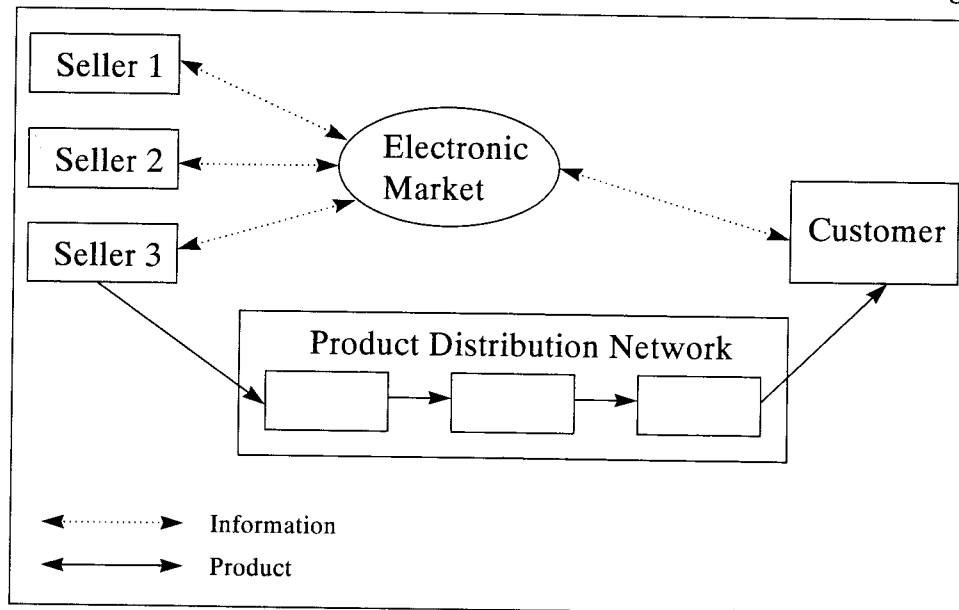


Figure 5.2: Industry Structure with an Electronic Market

An electronic market offer a mechanism for reducing the search costs (money, time and effort expended to gather product price, quality and feature information) for consumers. The occurrence “search” can be described as a buyer canvassing various sellers to ascertain the most favourable price (Stigler, 1961). Search also reduces the likelihood that sellers will be able to charge significantly higher prices than their competitors because the consumer is unaware of the other prices (a form of regional oligopoly or monopoly). The result is that consumers can buy products for lower prices, intermediaries such as wholesalers are eliminated from the value chain, a new industry that provides access to electronic markets is created, and firms that produce products are able to maintain a profit margin comparable to the traditional markets.

The second phase in the alteration of the structure of an industry is the digitization of the product itself as well as its distribution. Examples of digitizable products include books, newspapers, magazines, computer software, movies and music. These products involve a cost structure with increasing returns and low marginal reproduction costs. Increasing returns accrue when a business incurs large up-front expenditures to develop a new product/service and the incremental cost of producing each new unit is minimal (Hagel and Armstrong, 1997). For example, if a consumer wants a new version of Navigator software from Netscape, the software can be downloaded from one of their sites on the Internet (Netscape). This eliminates the need for Netscape to maintain an inventory of software on CDs or diskettes that must be physically shipped to the consumer. Another example would be either evaluating or purchasing anti-virus software from McAfee (McAfee). If a software company charges for their software then they can receive payment before the software is allowed to be downloaded. This can be especially easy as electronic payment methods become more widely used in the future. This further transformed industry structure that results from the digitization of products and their distribution is described in Figure 5.3.

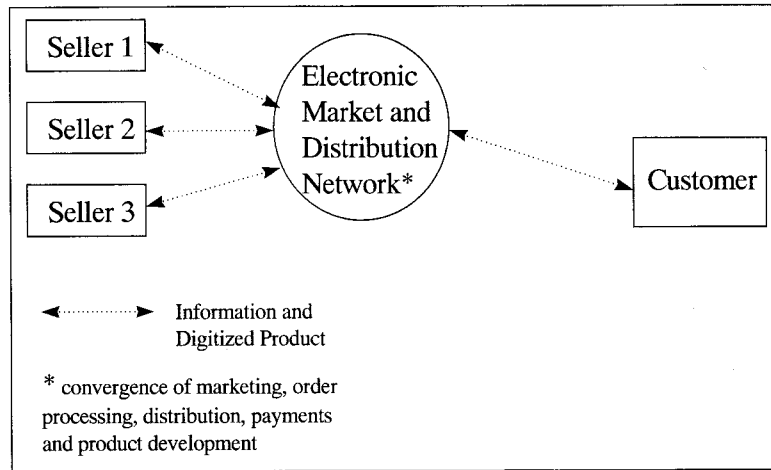


Figure 5.3: Industry Structure with an Electronic Market and Distribution Network

The electronic market and distribution network allow a wide range of seller and customer activities to converge into one place including marketing, order processing, distribution, payments and even product development processes that involve several separate firms. This makes these activities easier and more convenient while also reducing the costs involved. Value chain costs can be further reduced by digitizing the industry’s product. Examples of digitizable products were given earlier. Digitization of the product reduces inventory and packaging costs. Digitized products can then be distributed electronically to the consumer which minimizes distribution costs which would otherwise be paid to the firms in the distribution network and passed on to the final consumer. These cost-based differences are discussed in more detail in Section 5. Beyond the cost benefits, cycle time for order fulfillment is minimized which may result in improved customer satisfaction. Digitized information can be distributed in minutes while shipping a product generally takes days (or longer to some parts of the world). The characteristics of the phases in the transformation of industry structures enabled by e-markets are summarized in Table 5.1.

Table 5.1: The Phases of Industry Structure Transformation Enabled by Electronic Markets

	Traditional Market (example: retail store)	Electronic Market (Phase 1)	Electronic Market and Distribution (Phase 2)
Required industry characteristics	Transactions that do not require hierarchical governance	Accepted standards for describing the product through the electronic market	Description standards plus product that is feasibly digitized
Market digitized	No	Yes	Yes
Product and distribution digitized	No	No	Yes
Examples of intermediaries removed		Wholesalers and some forms of brokers (ones that simply gather and analyze information for consumers)	Phase 1 intermediaries plus firms in the physical distribution network
Examples of intermediaries added		Firms that provide access to the electronic market (ISPs or firms that operate electronic markets or electronic auctions) and possibly new forms of brokers (such as online better business bureaus)	Phase 1 intermediaries

The overall impact of electronic markets on industry structures is not severely cost reduction and disintermediation. It is more complex than that. New intermediaries and costs may be added to a value chain, but in many instances the potential benefits outweigh these costs. In the next section, we discuss a model that identifies costs relevant to differentiating between traditional and electronic markets from a buyer perspective.

5.3.3 Traditional and Electronic Markets: Buyer Cost Perspective

Electronic markets provide buyers with an additional sales channel during which they can buy products. Although there may be certain benefits derived by buyers in electronic markets (lower prices and search costs), it also increases the complexity of their decision process by adding another option to consider. It may also add new forms of consumer risk. In this section, we describe a model to compare the cost-based differences between traditional markets (such as retail stores) and electronic markets.

Buyer Perspective Relevant Costs

From the consumer perspective (demand side of a transaction), the potentially pertinent costs that we have identified include:

1. Product price (P_B),
2. Search costs (SC_B),
3. Risk costs (RC_B),
4. Distribution costs (DC_B),
5. Sales tax (T_B),
6. Market costs (MC_B).

The product price is the sum of the production costs, organization costs, and profits of the value chain that provides the product or service. Search costs include the time, attempt and money involved in searching for a seller who has the product demanded at an acceptable price with acceptable product features and quality. The cost of the time and effort involved would be determined by the value the buyer places on their time and effort. Risk costs include the costs involved in minimizing transaction risk as well as the costs associated with losing value in a transaction. The risk dimensions typically considered are economic risk, performance risk, and personal risk (Simpson and Lakner, 1993). Economic risk stems from the possibility of monetary loss associated with buying a product. Performance risk represents the consumers' perception that a product or service may fail to meet expectations. Personal risk relates to the possibility of harm to the consumer resulting from either a product or the shopping process. An additional form of risk that is potentially important to Internet shoppers is privacy risk. Privacy risk reflects the degree to which consumers envisage a loss of privacy due to information collected about them as they shop (Jarvenpaa and Todd, 1997). Additional costs of concern include distribution costs, the costs associated with physically moving the product from the seller to the buyer, and sales tax. Market costs are the costs associated with participating in a market. Traditional markets are assumed to be costless to the buyer, while e-market costs may include fixed access costs and/or transaction (variable) costs paid to the firm(s) that operate the e-market.

Comparison of Buyer Costs in Traditional and Electronic Markets

Assuming rational decision making, the buyer's purpose is to minimize the sum of the individual costs subject to the constraints that the product quality and features, including how soon the product can be

received, must be acceptable. Figure 5.4 summarizes the findings of our evaluation of the costs relevant to a buyer's choice between traditional and electronic markets.

	Traditional Market	Electronic Market
P_B	○	●
SC_B	○	●
RC_B	●	○
DC_B	●	○
T_B	○	●
MC_B	●	○

Lower ●

Higher ○

Figure 5.4: Comparison of Buyer Costs in Traditional and Electronic Markets

Prices in electronic markets are usually lower than in traditional markets. If they were higher then there would be little incentive for consumers to switch to the newer e-markets. One explanation for why prices are lower is that search costs are lower. It is commonly easier to gather relevant information, and compare a wider range of prices, in online environments. This is particularly true as the number of products offered online increases. In traditional retail markets a buyer would have to either drive around town or call several sellers. This takes more time and costs more. Given this additional information in the e-market, buyers are likely to be able to find a price that is lower than in a traditional market. The question then is why aren't all products purchased in e-markets? One reason is that there are additional risks associated with buying online. It is apparent that buyers have incentives to participate in e-markets. These online markets provide access to specialized knowledge, fulfill the need to communicate with sellers, allow them to find and talk to other buyers with similar needs or experiences, enable access to multimedia information, allow participation at their convenience, integrate the consumer process, and enable sellers to tailor their products to individual needs (Champy *et al.*, 1996). Given that there are incentives for buyers to participate in e-markets, the next issue is whether there are incentives for sellers to participate. Without any sellers in the e-market there would be no transactions.

5.3.4 Traditional and Electronic Markets: Seller Cost Perspective

Electronic markets provide sellers with an supplementary sales channel where they can market and sell their products. As with buyers, electronic markets provide sellers with certain benefits including reduced advertising costs (costs associated with seller's search for buyers), improved ability to target customers, greater ability to tailor products and services to their customers, lower overhead costs, broader geographic reach, and disintermediation potential (Hagel and Armstrong, 1997). But, it also increases the complexity of their operations by adding a new potential sales channel to evaluate which changes the way they may do business in the future. In this section, we describe a model we developed

to compare the cost-based differences between traditional markets (such as retail stores) and electronic markets from a seller perspective.

Seller Perspective Relevant Costs

From the seller perspective (supply side of a transaction), the potentially relevant costs that we have identified include:

- Marketing (advertising) costs (AC_s),
- Overheard costs (OC_s),
- Inventory costs (IC_s),
- Production costs (PC_s), and
- Distribution costs (DC_s).

Marketing costs are the costs associated with informing the consumer about the accessibility and features of a seller’s products or services. Advertising channels in traditional markets include television, radio, newspapers, yellow pages, and so forth. Newer advertising channels include push-based methods (such as electronic mail), and pull-based methods (such as electronic bulletin boards and the Web) (Kalakota and Whinston, 1996). Overhead costs include the more fixed costs of the business including physical retail space and warehouses. Inventory costs include the costs to handle and hold inventory to deal with demand uncertainty for physical products. Production costs include the variable costs of producing a unit of a product including labor and materials. Distribution costs include the costs associated with moving the product from the seller to the buyer.

Comparison of Seller Costs in Traditional and Electronic Markets

Assuming rational decision making, the seller’s purpose is to minimize the sum of the individual costs subject to the constraints that they provide the products and services demanded by their customers. Figure 5.5 summarizes the findings of our evaluation of the costs relevant to a seller’s choice between traditional markets, e-markets with non-digitized products, and e-markets with products that have been digitized.

	Traditional Market	E-Market (non-digital product)	E-Market (digital product)
AC_s	○	●	●
OC_s	○	●	●
IC_s	○	○	●
PC_s	○	○	●
DC_s	●	○	●

Lower ●

Higher ○

Figure 5.5: Comparisons of Seller Costs in Traditional and Electronic Markets

Advertising costs are lower in e-markets than in conventional markets. For example, the advertising cost per consumer for a Web page is much lower than a television ad or a print ad (magazine or newspaper). This is true whether the product is digitized or not. Overhead costs are comparable to advertising costs. Traditional retail store markets require a seller to have a physical location they may either own or rent. In e-markets, a Web site may also serve as the storefront. This is especially true when the capability to order products electronically is integrated into the Web site. Inventory costs are more closely related to the product characteristics instead of the consumer interface. When products are digitized they require an inventory level of only one unit and the product is stored on a computer disk. The situation for production cost differences is similar to inventory costs. Physical products involve significant variable costs per unit for materials and labour. Reproduction of digitized products generally involves the copying of the computer file. Distribution cost differences are more complex. In an e-market with a digitized product, the product can be distributed electronically, perhaps through FTP, to the consumer. This is a very low cost distribution method. Traditional markets also have low distribution costs for sellers because the consumer comes to the store and transports the product to their home themselves. An electronic market with a non-digitized product still requires physical shipment of the product, for example through the USPS or Federal Express. This is the situation with the highest distribution cost to the seller.

5.3.5 Revenue Source Implications

A number of implication for business strategy (and potential sources of revenue) are obvious from our findings related to our e-market model and empirical study. These implications affect several entities: product/service providers, transaction brokers, Internet service providers (market makers), and also state and federal government. The buyer costs relevant to each of the entities (as potential sources of revenue) are marked in Figure 5.6.

	P_B	SC_B	RC_B	DC_B	T_B	MC_B
Product and Service Providers	X		X			
Transaction Intermediaries		X	X	X		
Interactive Service Providers		X				X
Government					X	

Figure 5.6: Buyer Transaction Costs and Entity Revenue Source Implications

Product/Service Provider Implications: The returns implications for product/ service providers in an e-market come from the price and risk cost components, P_B and RC_B , of our buyer cost model. Essentially, sellers can compete using a low cost producer strategy, and/or they can compete using a strategy by which they differentiate themselves from other sellers because they are less risky (more

trusted) in the market. Competing based on reducing buyer risk costs, when the seller/buyer relationship is supported electronically, can be described as an *electronic virtual partnership*. This is described in Figure 5.7.

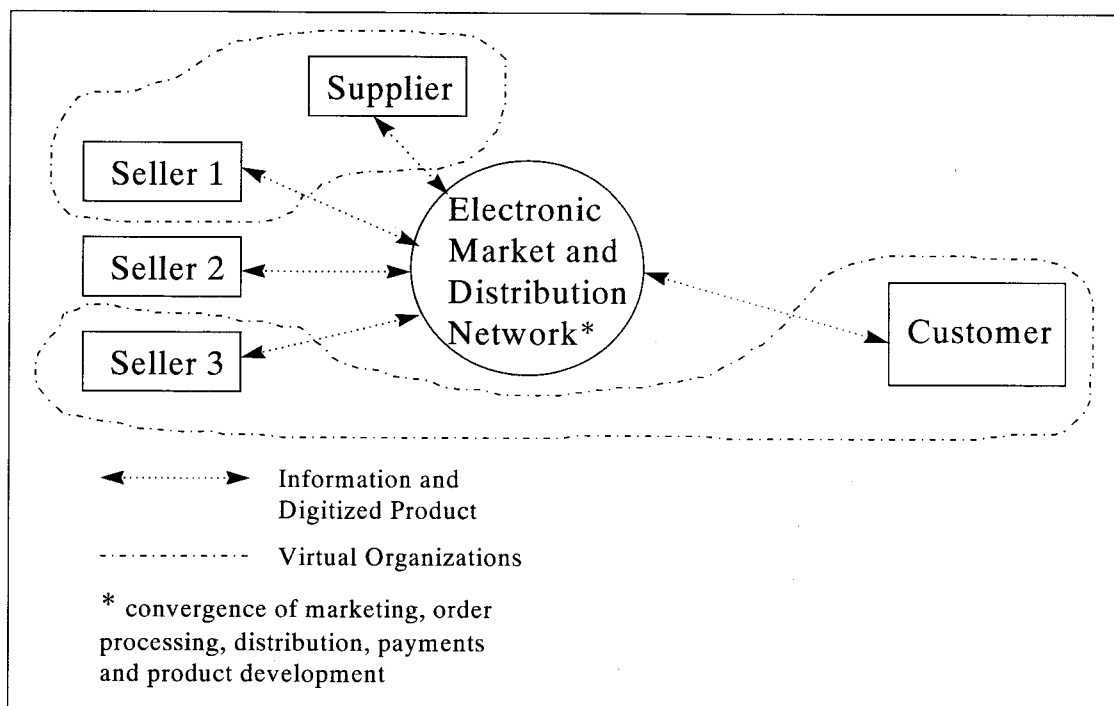


Figure 5.7: Electronic Market Enabled Virtual Partnership

This is interesting because it explains how, overtime, sub-markets may form within the overall electronic market because consumer knowledge is limited and there is still a cost to gather information about new sellers. Overtime, there are reduced incentives for buyers to search the entire e-market for sellers of a product that has been purchased in the past. Unless a seller's price is significantly lower than prices from a trusted seller the switching cost will inhibit the consumer from buying from the unknown seller. Electronic markets also affect potential revenue sources for other organizations that support commercial transactions.

Transaction Intermediary Implications: The implications for transaction agent (e.g. stock brokers, real estate agents, intelligent agent software developers, and so forth) in an e-market come from the search and risk cost components, SC_B and RC_B , of our model. In some situations buyers may be willing to pay someone to gather and/or analyze market information (a traditional broker role) related to their purchases, or they may pay for software that provides this same functionality (decision support software or more advanced intelligent agent software). They will pay for someone or something (such as an intelligent agent system) to do their searching. Also, consumers may be willing to pay for broker services such as risk assumption. For example, consumers may be willing to pay for a service such as an online better business bureau where they could check to see if there have been complaints against a certain seller. There are also implications for distribution companies (such as Federal Express) that arise from the distribution cost component, DC_B , of our model. Package shipment companies can expect continued growth in their business related to increased usage of e-markets, but, as more and more products are digitized, this growth may be reduced.

Internet Service Provider (Market Maker) Implications: The revenue implications for Internet service providers come from the market and look for cost components, MC_B and SC_B , components of our model. Consumers may be willing to pay ISPs a portion of the money they save by buying products in an e-market versus a traditional market to gain access to the e-market. Consumers may also be willing to pay for access to systems because they provide much more than just e-market access, for example entertainment. The growth of ISPs clearly shows that consumers are willing to pay for these services. The fixed cost that consumers pay to ISPs varies, but it is common to pay about \$20 per month.

Government Implications: Lastly, the implications for state and federal government come from the tax component, T_B , of our model as well as organizational revenue generated through e-market transactions. As more transactions move from traditional markets to e-markets, it is likely that a smaller proportion of sales tax will be collected by State Governments. Usually, laws exist that require the payment of sales taxes even on interstate commerce, but collection is a practical problem. This is especially likely since entry barriers into e-markets are low which increases the likelihood that there will be an increase in the number of sole proprietorships and small businesses that sell products online to buyers around the world. It is harder to track a large number of small sellers. It is also more difficult to track e-market transactions that involve buyers and sellers in different countries. For state and federal government there is also the problem of collecting tax from all of these sellers for taxable income generated from e-market transactions. As these problems increase with the growth of e-commerce, we can expect a greater effort on the part of government to collect the sales tax and income tax they are owed.

5.4 ADVANTAGES AND DISADVANTAGES OF E-MARKET

Like any conventional business, electronic market is also characterized by some advantages and inherent drawbacks. Let's have a look at some of these important advantages and disadvantages of electronic market.

Advantages of Electronic Market

The greatest and the most important advantage of e-market, is that it enables a business concern or individual to reach the global market. It caters to the demands of both the national and the international market, as your business activities are no longer restricted by geographical boundaries. With the help of electronic market, even small enterprises can access the global market for selling and purchasing products and services. Even time restrictions are nonexistent while conducting businesses, as e-market empowers one to execute business transactions 24 hours a day and even on holidays and weekends. This in turn significantly increases sales and profit.

Electronic market gives the customers the opportunity to look for cheaper and quality products. With the help of e-market, consumers can easily research on a specific product and sometimes even find out the original manufacturer to purchase a product at a much cheaper price than that charged by the wholesaler. Shopping online is usually more convenient and time saving than conventional shopping. Besides these, people also come across reviews posted by other customers, about the products purchased from a particular e-market site, which can help make purchasing decisions.

For business concerns, e-market significantly cuts down the cost associated with marketing, customer care, processing, and information storage and inventory management. It reduces the time period involved with business process re-engineering, customization of products to meet the demand of particular customers, increasing productivity and customer care services. Electronic market reduces the burden of infrastructure to conduct businesses and thereby raises the amount of funds available for

profitable investment. It also enables efficient customer care services. On the other hand, it collects and manages information related to customer behaviour, which in turn helps develop and adopt an efficient marketing and promotional strategy.

Disadvantages of Electronic Market

Electronic market is also characterized by some technological and inherent limitations which have restricted the number of people using this revolutionary system. One important disadvantage of e-market is that the Internet has still not touched the lives of a great number of people, either due to the lack of knowledge or trust. A large number of people do not use the Internet for any kind of financial transaction. Some people simply refuse to trust the authenticity of completely impersonal business transactions, as in the case of e-commerce. Many people have reservations regarding the requirement to disclose personal and private information for security concerns. Many times, the legitimacy and authenticity of different e-market sites have also been questioned.

Another limitation of e-market is that it is not suitable for perishable commodities like food items. People prefer to shop in the conventional way than to use e-market for purchasing food products. So e-market is not suitable for such business sectors. The time period required for delivering physical products can also be quite significant in case of e-market. A lot of phone calls and e-mails may be required till you get your desired products. However, returning the product and getting a refund can be even more troublesome and time consuming than purchasing, in case if you are not satisfied with a particular product.

Thus, on evaluating the various pros and cons of electronic market, we can say that the advantages of e-market have the potential to outweigh the disadvantages. A proper strategy to address the technical issues and to build up customers trust in the system, can change the present scenario and help e-market adapt to the changing needs of the world.

5.5 ADVANTAGES AND DISADVANTAGES OF E-MARKETS IN FUTURE

Advantages

The e-markets in future can be used as instruments to cover the risks derived from the fluctuations of cash prices before expiration.

The futures contracts present less initial costs than other alike instruments, due that you only have to deposit guarantee or margin an underlying asset of greater value.

The survival of an organized stock market and of consistent contracting terms gives liquidity and offers to the participants the possibility of closing positions on a date before the expiration.

The participant's parts on the contract don't presume any risk of insolvency; the clearinghouse guarantees the liquidation of the contract.

Disadvantages

In a comparable way as to what happens in the case of the term contracts, with the futures we are bare to the risk that our vision of the contract is not correct.

If you use the futures contracts as covering instruments you will loose the possible benefits of the movement in future prices.

Being the contracting terms consistent, there doesn't exist futures contracts for all the instruments nor for all the merchandise and they might not cover exactly all the cash positions.

5.6 ELECTRONIC MARKET IN FUTURE

Based upon our analysis of a number of current examples of electronic markets, and the buyer and seller cost-based differences between traditional and electronic markets we have identified, we make several observations and conclusions. First, we discuss some factors that may inhibit the growth of electronic markets in the future. Second, we identify some factors that affect the level of impact that e-markets may have on industries.

5.6.1 Inhibitors to Electronic Market Success

Throughout this lesson we have assumed that the impact of certain factors that inhibit the future success of all e-markets, and e-commerce in general, will not sufficiently hinder their growth in the future. If this assumption is not true, then the study of electronic markets is moot given they may not exist in the future. It is important to acknowledge the existence of barriers to electronic market success. Four examples of inhibitors to electronic market success are discussed below.

Lack of IT infrastructure: The lack of IT infrastructure in some world regions is a barrier to e-commerce participation by companies and consumers in these regions. In many countries consumers do not have the same level of access to the Internet, World Wide Web, and so forth that consumers in the United States have. This is a major barrier to electronic market diffusion because even if consumers wish to participate in e-markets, they are physically unable to. Even if access is available, an additional barrier may be poor physical telecommunications. However, the increasing recognition of the importance of telecommunications to national and business infrastructure has resulted in its proliferation to newly opened societies and markets, most notably Eastern Europe and the former Soviet Union, and to rapidly expanding markets such as Egypt and Iran (Goodman *et al.*, 1994). We should expect a continuation in this trend toward greater access.

Computer illiteracy: The level of computer illiteracy associated with the world's consumers that have access to IT infrastructure is a barrier to e-market success. Because of a lack of education about computers, or a lack of willingness to accept new technology, a certain proportion of consumers are unable or unwilling to participate in electronic markets. As more and more children are introduced to computers in school, the proportion of consumers who potentially may participate in electronics will increase in the future. Electronic markets are likely to be considered normal instead of novel for future generations of consumers.

Insufficient security: Insufficient data and message security may inhibit some companies and consumers from participating in e-commerce because they feel the level of risk is unacceptable. Confidence, reliability, and protection of information against security threats is a crucial prerequisite for the functioning of electronic commerce (Kalakota and Whinston, 1996). Many initiatives are under way to improve security through improved data encryption and digital signatures. A specific example is S-HTTP, a more secure version of HTTP that is used in the World Wide Web. As the level of transaction security for e-commerce related information transfer improves, the expected level of e-market impact on industries, and the global economy in general, will increase.

Hierarchical transaction governance: An additional inhibitor to e-market success is the fact that a significant portion of all transactions are not market transactions, but are hierarchical transactions. Hierarchical transaction governance is often associated with transactions involving high asset specificity (Williamson, 1985). Asset specificity is the difference between the value of an asset (machine, employee and so forth) in its present use and its next best use. Transactions involving high

asset specificity will continue to be governed by hierarchies because the firms involved generally need to maintain greater control over the transactions (perhaps through vertical integration or long term contracts) to minimize their overall risk.

These inhibitors, as well as other factors such as high market access costs, have resulted in the failure of some electronic markets. One example is an electronic market for real estate. The National Association of Realtors' widely publicized information network, created two years ago to provide extensive real-estate information on the World Wide Web, has run out of its \$12.9 millions in funding and is on the verge of collapse. Association officials and people in the industry say the network fell victim to overly ambitious goals, some free-spending ways and unexpected changes in technology that made it less attractive to its primary customers, real-estate agents. Funded from the national association's reserves, Realtors Information Network, or RIN, had lofty plans for keeping Realtors in control of real-estate transactions. The for-profit subsidiary would provide real-estate listings nationwide on the Web to consumers and would act as something of a proprietary America Online for real-estate agents. Agents who purchased the system would have access to information, chat rooms, real-estate vendors and e-mail. Along the way, network officials misjudged their audience.

Initially, the network tried charging \$2 for each home listing on its Web site. But when competition charged less, it cut the price until it stopped charging for listings at all. Meanwhile, advertising for the site, which now has about 350,000 listings, never materialized. At the same time, the proprietary system for agents bombed. In New Jersey, a pilot state, fewer than 1,000 New Jersey Association of Realtors' 36,000 members chose to subscribe, says Michael Ford, the state group's president-elect and a national association director. Only four of the state's 18 multiple-listing services posted their listings on it (National Association of Realtors). This example highlights the need to understand the needs of both product/service providers as well as consumers in a market, especially when start up costs are in the millions. Market participants should not be charged anything to subscribe to a new electronic market until a large number of product/service providers and consumers are participating and both sides see the value of the e-market. With limited revenues at the beginning, new electronic markets need to tightly control their startup and operation costs.

5.6.2 Contributors to Electronic Market Success

It is also apparent, based on an analysis of the e-market examples previously discussed, that electronic markets will impact some industries more than others. The question then is what are some of the factors that determine this level of impact? We have identified six factors that each fall within one of four categories: product, industry, seller and consumer characteristics.

Product characteristics: First, the form of the product is important. Digitizable products are particularly suited for electronic markets because they not only take advantage of the digitization of the market mechanism, but also the distribution mechanism, resulting in very low transaction costs. It also enables the order fulfillment cycle time to be minimized. Examples of digitizable products were described earlier.

Second, the magnitude of the product price may be an important determinant. The higher the product price, the greater the level of risk involved in the market transaction between buyers and sellers who are geographically separated and may have never dealt with each other before. Some of the most common items currently sold through e-markets are low priced items such as CDs and books.

Industry characteristics: An industry factor that affects the impact of e-markets is the level of standards that exist in an industry for describing products. A lack of available standards that both the buyer and

seller recognize is a barrier to consummating sales electronically. Current description standards would generally be textual, but future standards could include multimedia options. As multimedia capabilities such as video, audio, and perhaps virtual reality (enabled by the virtual reality markup language, VRML, in the WWW), are incorporated into electronic market interfaces it will become easier to describe products to potential consumers.

A second industry characteristic is the need for a transaction broker. Electronic markets are most useful when they are able to directly match buyers and sellers. Industries that require transaction brokers, or third parties, may be affected less by electronic markets than are industries where no brokers are required. Stock brokers, insurance agents, and travel agents may provide services that are still needed, but in some cases software may be able to replace the need for these brokers. This is particularly true as more intelligent systems that assist consumers become available.

Seller characteristics: E-markets reduce search costs enabling consumers to find sellers offering lower prices. In the long run this reduces profit margins for sellers that compete in e-markets, although it may also increase the number of transactions that take place. If sellers in an industry are unwilling to participate in this environment, then the impact of e-markets may be reduced. In highly competitive industries, with low barriers to entry, sellers may not have a choice. But, in oligopolistic situations, sellers may determine the success of e-markets in an industry if they want to maintain an environment of lower volume, higher profit margin transactions.

Consumer characteristics: Consumers can be classified as either impulse, patient or analytical. Impulse buyers purchase products quickly with little analysis, patient buyers purchase products after making some comparisons, and analytical buyers do substantial research before making the decision to purchase products or services (Kalakota and Whinston, 1996). Electronic markets may have little impact on industries where a sizable percentage of purchases are made by impulse buyers. An example of this is grocery store purchases. A high percentage of sales in these stores are impulsive. Because electronic markets require a certain degree of effort on the part of the consumer, these markets are more conducive to consumers who do some comparisons and analysis before buying (the patient or analytical buyers). Analytical buyers can use the facilities available to analyze a wide range of information before deciding where to buy.

The determinants discussed provide a framework for estimating the impact of e-markets on current or future industries. The more industry features (including product, industry, seller, and consumer characteristics) associated with higher e-market impact, the greater the expected impact of e-markets on that industry.

Check Your Progress

Fill in the blanks:

1. Electronic markets are the of electronic commerce.
2. The electronic market and distribution enables a wide range of seller and customer activities.
3. B2B indicates to the full spectrum of E-commerce operation that can occur between organizations.
4. An additional inhibitor to e-market success is the fact that a significant portion of all transactions are not market transactions, but are transactions.

5.7 LET US SUM UP

One issue that is restricting the acceptance of Web EC is that the Internet is not a particularly good platform for managing the integrity or security of high-volume EC transaction processing. Exchange of information, products, services and payments using Internet, networks and digital technologies, e.g. prices, purchase orders, invoices, shipping notices is called the electronic market. Commercial transactions have taken place for centuries, but currently there is a revolution taking place that is transforming the marketplace. Like any conventional business, electronic market is also characterized by some advantages and inherent drawbacks. Let's have a look at some of these important advantages and disadvantages of electronic market. The future markets can be used as instruments to cover the risks derived from the fluctuations of cash prices before expiration. In a similar way as to what happens in the case of the term contracts, with the futures we are exposed to the risk that our vision of the contract is not correct. Based upon our analysis of a number of current examples of electronic markets, and the buyer and seller cost-based differences between traditional and electronic markets we have identified, we make several observations and conclusions.

5.8 KEYWORDS

B2B E-commerce: B2B indicates to the full spectrum of e-commerce operation that can occur between two organizations.

E-Market: Electronic markets provide sellers with an additional sales channel where they can market and sell their products.

Digitizable Products: Digitizable products are particularly suited for electronic markets

SET: Secure Electronic Transaction

5.9 QUESTIONS FOR DISCUSSION

1. What is business-to-business e-commerce? Explain with an example.
2. Discuss the steps of inter-organizational transaction.
3. What is e-market? Give its advantages and disadvantages.
4. Who are the main contributors in the success of e-commerce?

Check Your Progress: Model Answer

1. foundation
2. network
3. two
4. hierarchical

5.10 SUGGESTED READINGS

Robert T. Plant, *eCommerce: Formulation of Strategy*, Prentice Hall (2000)

Janice Reynolds, *The Complete E-Commerce Book: Design, Build and Maintain a Successful Web-Based Business*, CMP Books (2004).

Ravi Kalakota, Andrew Winston, *Frontiers of Electronic Commerce*

P.T.Joseph, *e-Commerce – A Managerial perspective*

G.Winfield Treese & Lawrence C.Stewart, *Designing Systems for Internet Commerce*

Kamelesh K Bajaj, Debjani Nag, *e-Commerce The Cutting Edge of Business*

Dr.Ravi Kalakota, Marcia Robinson, *E Business Road Map for Success*

LESSON

6

ELECTRONIC DATA INTERCHANGE

CONTENTS

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- 6.2 Electronic Data Interchange
- 6.3 EDI Examples
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- 6.7 EDI Agreements
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- 6.9 Purchasing Online
- 6.10 Let us Sum up
- 6.11 Keywords
- 6.12 Questions for Discussion
- 6.13 Suggested Readings

6.0 AIMS AND OBJECTIVES

After studying this lesson, you will be able to:

- Explain the electronic data interchange definitions
- Discuss the examples of EDI
- Describe the EDI technology, communication and implementation
- Identify and explain the EDI agreements
- Discuss the security of EDI
- Explain the concept of online purchasing

6.1 INTRODUCTION

Electronic Data Interchange (EDI) is defined as the interprocess communication (computer application to computer application) of business information in a standardized electronic form. The EDI, trading partners establish computer-computer links that enables them to exchange information electronically.

Electronic Commerce is a term popularized by the advent of commercial services of the Internet. Internet e-commerce is however, only the part of overall sphere of e-commerce. The commercial use of Internet is perhaps typified by once-off sale to consumers. Other types of transactions use other technologies. Electronic Markets (EMs) are in use in a number of trade segments with an emphasis on search facilities and Electronic Data Interchange (EDI) is used for regular and standardized transactions between organizations. In this lesson, we will study the concept of EDI.

6.2 ELECTRONIC DATA INTERCHANGE

EDI was developed in early 60s as a means of accelerating the movement of documents related to shipments and transportation. However, from the beginning of 80s it is now widely used in various other sectors like automotives, retails, and international trade. Its relevance and usage is growing at a very fast pace.

EDI is based on a set of standardized messages for the transfer of structured data between computer applications. It may have many applications e.g., sending the test results from the pathology laboratory to the hospital or dispatching exam results from exam boards/university to school/college, but it is primarily used for the trade exchanges: order, invoice, payments and many other transactions that can be used in national and international trade exchange.

Notable users of EDI are vehicle assemblers, ordering components for their production lines, and supermarkets (and other multiple retailers), ordering the goods needed to restock their shelves. EDI allow the stock control/material management system of the customer to interface with the stock control/production systems of the suppliers without the use of paper documents or the need of human intervention.

The EDI is used for regular repeat transactions. EDI is a formal system and it does not really have a place in the search and negotiation phases. EDI, when initially introduced was seen by many as a universal, or at least a generalized form of trading.

In the event its adoption has been limited to a number of trade sectors where the efficiency of supply chain is of vital importance. EDI is part of schemes for just-in-time manufacture of quick response supply. Mature use of EDI allows for a change in the nature of the product or service being offered mass customization is such an example.

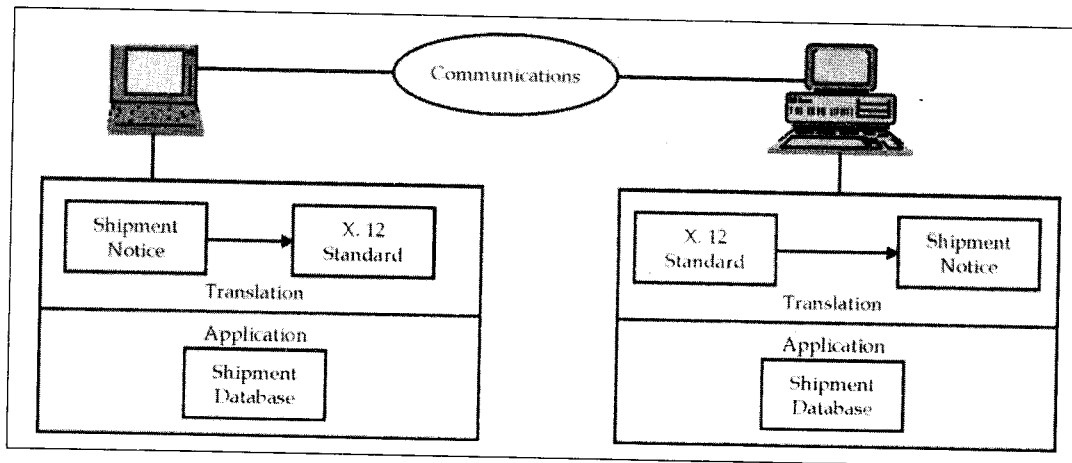


Figure 6.1: The EDI Process

The following are the definition of Electronic Data Interchange:

- Electronic Data Interchange is the transmission, in a standard syntax, of unambiguous information of business or strategic significance between computers of independent organizations. (The Accredited Standards Committee for EDI of the American National Standards Institute)
- Electronic Data Interchange is the interchange of standard formatted data between computer application systems of trading partners with minimal manual intervention. (UN/EDIFACT Training Guide)
- Electronic Data Interchange is the electronic transfer, from computer to computer, of commercial and administrative data using an agreed standard to structure an EDI message.

EDI is an abbreviation for Electronic Data Interchange. The basic definition of EDI is:

Computer-to-computer communication of business documents, in a standardized format, between two companies.

6.3 EDI EXAMPLES

Any EDI example – whether using EDI outsourcing or EDI software/managed services involve four main components including:

EDI and Infrastructure Layer

(Software and hardware for converting data into and out of EDI).

Like any other application, the EDI software needs hardware to run on. The first piece of the EDI puzzle is the EDI software layer itself – the EDI translator itself. Like any other software application, the EDI software needs hardware to run on. These systems will need sophisticated antivirus, firewall, and possibly intrusion detection software. By definition, EDI is a system that communicates with companies on the other side of the firewall, which leaves it immensely vulnerable to attack. EDI is also an application that must operate on a 24×7 basis since orders are often sent by customers during off-peak hours. Thus, system monitoring software is required to ensure that the servers are performing optimally and send alerts the moment anything goes wrong.

EDI Mapping Layer

(Software for reconciling data between you and your trading partners)

The mapping layer is where the electronic trading parameters are set up for every EDI relationship that is implemented. These maps, which sit on top of the translation layer, are slightly different for each trading partner due to particular supply chain or business process requirements of the relationship. Also, since a map is needed for each transaction with every unique trading partner, the number of maps can add up quickly.

For example, if Company A has 10 trading partners that it conducts business with using EDI, and each trading partner requires Company A to conduct three transactions, 30 maps are needed. As companies add partners over time, those numbers keep going up; as do the requirements for keeping the maps and the data they're transmitting synchronized.

EDI Connectivity Layer

(Software and network technology for transporting data between you and your trading partner)

The third EDI layer is connectivity. While the first two components have to do with data processing, the third is all about transporting that data between Company A and its trading partners. The upfront costs here have to do with providing the numerous communications methods that trading partners might require. These include a VAN mailbox, which provides access to a specialized proprietary network, often called a value-added network; AS2 software support, which is a secure Internet protocol that large trading partners such as Wal-Mart often use; and even secure FTP sites available via the Internet. Many companies today have to support all three to satisfy their full trading partner community. After setup, high costs are often associated with the ongoing transaction fees for using a VAN, software maintenance fees for FTP and AS2 software, and staffing associated with upkeep.

EDI Application Integration Layer

(Software for exchanging data into and out of your accounting system)

Application integration allows companies to move data between their own ERP and/or accounting systems and the EDI translator. The last of the EDI pieces is application integration. In short, application integration allows companies to move data between their own ERP or accounting systems and the EDI translator to eliminate manual keying of data – an extremely valuable feature. In some cases, prebuilt software modules, called adapters, can be used to reduce development time for certain ERP and accounting systems. Once implemented, the integration layer has to be maintained to keep it current with accounting system version upgrades and changes to trading partner EDI specifications.

6.3.1 EDI Applications in Business

Electronic Data Interchange is widely-used technology for the automated exchange of documents between dissimilar applications. It allows value chain partners to exchange purchase orders, invoices, advance ship notices, and other business documents directly from one business system to the other, without human intervention. Proven advantages are fewer errors, lower administrative costs, and faster order-to-cash cycles.

The high penetration levels of Electronic Data Interchange, a mechanism for inter-organizational electronic commerce, has revolutionized the way organisational's conduct their business. Major benefits derived from EDI, however, depend upon the use of appropriate controls to overcome potential risks

and exposures inherent in integrating and utilizing of the system. As many resources and skills are required for the implementation of EDI controls, their design should proceed carefully.

A data envelopment analysis is the model to analyze the efficiency of controls in the context of finance and trade. The model uses eight variables of formal or automated EDI controls as input and four variables of EDI implementation and performance as output. Automated controls are more efficiently utilized in financial than in trade applications, while formal controls are more efficiently used in trade applications. Every company can determine the relative amount of reduction in each mode or component of controls in order to make the control system efficient.

- **Business** – commercial, industrial, or professional dealings
- **Commerce** – the buying and selling of goods, especially on a large scale
- **Trade** – the act or instance of buying or selling.

These simple definitions make one thing very clear to stay in business; a company must execute transactions with other parties. While all companies desire to engage in such transactions, advances in the use of certain technologies may actually present barriers to their doing so ... especially with specific trading partners.

6.3.2 EDI Applications in e-Commerce

The dictionary mentioned above also defines e-commerce as “commerce that is transacted electronically, as over the internet.” As larger suppliers and retailers have advanced their use of certain technologies – specifically Electronic Data Interchange – they have been able to conduct business more efficiently. As these companies have mandated the use of similar technologies by their trading partners, many small to mid-market companies have become disadvantages in their attempts to “trade” with such firms.

EDI is a set of protocols for conducting electronic business over computer networks. Traditionally, these networks have been private WANS; but EDI is now done over the Internet. EDI defines the electronic exchange of structured business data, such as purchase orders, invoices, and shipping notices, typically between one organization and another. The relationship is usually between a vendor and customer. For example, EDI provides a way for a customer's computer to place orders for goods with a vendor's computers, based on reorder levels. The EDI system coordinates the transaction, initiates deliveries, and generates invoices.

It is important to differentiate between EDI and electronic commerce. Electronic commerce encompasses all aspects of electronic business exchanges, including person-to-person interaction (collaboration), money transfers, 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. Standard form defines things like the layout of information for an invoice or purchase order.

EDI can reduce costs, workforce requirements, and errors associated with retyping orders, invoices, and other documents. With EDI, computer data already entered by one organization is made available to a business partner. EDI is typically handled using store-and-forward technologies similar to e-mail. A third party such as GEIS (General Electric Information Service) often serves as a “middleman” to help organizations establish business relationships and handle business transactions.

EDI can be thought of in terms of messages exchanged between businesses that are engaged in electronic commerce. Within a message is a basic unit of information called the data element. A message may consist of many data elements. For example, each line item on an invoice is a data element. All the data elements form a compound document, which is essentially a business form. An EDI message also includes a field definition table that provides information about the data elements in the message, such as whether an element is mandatory or optional, how many characters it has, and whether it is numeric or alphabetic. String identifiers define things like data element names and a data dictionary reference number. The data element dictionary defines the content and meaning of data elements.

EDI was first developed by the automobile/transportation industry in the 1970s. Today, it is widely used in a variety of industries, including distribution, finance and accounting, health care, manufacturing, purchasing, retail, tax form filing, and shipping. Early EDI packages used rather simple standard forms that forced companies to convert data to fit the forms. Newer EDI systems allow companies to create custom systems using simple programming or authoring tools. Even more recently, EDI has been adapted for the Internet and to work with XML, as discussed later.

There are two approaches to implementing EDI. Many large organizations acquire or build their own proprietary systems, often in association with their business partners. If a business partner is small, it may have little choice but to adopt the proprietary system of its much larger business associate. The other approach is to work with a VAN (Value Added Network) provider, which provides EDI transaction services, security, document interchange assistance, standard message formats, communication protocols, and communication parameters for EDI. Most VANs also provide a network on which to transmit information.

In many ways, the Internet is a better medium for implementing EDI than using value added network providers or installing private leased lines. The Internet is already in place as a business-to-business communication system. The startup costs are cheaper and, in most cases, the organization is already connected to the Internet. This makes it easier for more businesses to join the electronic commerce web, especially those who previously could not afford the expense of EDI.

The use of VPNs is growing for EDI and e-commerce-related traffic. A VPN can secure and give preferential treatment to EDI traffic. The term extranet is usually used to refer to a secure Internet connection between trading partners. The protocol for VPNs are L2TP (Layer 2 Tunneling Protocol), PPTP (Point-to-Point Tunneling Protocol), and the IETF's IPsec (IP Security). See "VPN (Virtual Private Network)."

6.4 EDI TECHNOLOGIES

6.4.1 EDI Architecture

The EDI architecture has four layers and these are:

- Semantic (Application) Layer
- Standard Translation Layer
- Packing (Transport) Layer
- Physical Network Infrastructure Layer

The EDI Architecture is shown in Table 6.1

Table 6.1

EDI Semantic layer	Application level Service	
EDI Standard Layer	EDIFACT business from standard	
	ANSI X12 Business from standard	
EDI Transport layer	Electronic mail	X435 MIME
	Point to Point	FTP, TELNET
	World Wide Web	HTML
Physical Layer	Dial Up lines, Internet, I-Way	

6.4.2 Benefits of EDI

The various benefits are

- Reduction on use of paper usage
- Greater emphasis on problem resolution and customer service
- Increase in Customer/Supplier Base
- Improvement in international trade
- Bank Checks
- Interbank Electronic Fund Transfer
- Automated Clearing House (ACH) Transfers
 - ❖ Bankwire
 - ❖ FedWire
 - ❖ CHIPS (Clearing House Interbank Payment System)
 - ❖ SWIFT (Society for Worldwide Intebank Financial Telecommunication)
- Usage in Health Care save lot of cost
- Improvement in Production by using Just-in-time approach
- Better business information and knowledge access
- Better design of product and effective procurement
- Improved legal services in terms of good postal service

The Indirect benefit include the following:

- Quick matching up of reduction in delay leading to better cash flow
- The ability to order regularly and quickly reduces the stock holding. The reduced stock holding cuts the cost of warehousing
- An established EDI system should be of considerable advantage to both customer and supplier. Shifting to a new supplier require that the electronic trading system and trading relationship be redeveloped.

- There is a steady increase in the number of customers, particularly large, customers that will only trade with suppliers that do business via EDI. Supermarkets and vehicle assemblers are prime examples. Thus, being ready and able to trade electronically can be a major advantage when competing for new business opportunities.

6.4.3 Standardization and EDI

All the software, hardware and networks must work together so that the information flows from one source to another in desired manner. Thus, at the heart of any EDI application is the EDI standards. The essence of EDI is the coding and structuring of the data into a common and generally accepted format—anything less is nothing more than a system of file-transfers.

Coding and structuring the documents for business transactions is no easy matter. There have been a number of EDI standards developed in various industry sector or with in a specific country and there are more complex committee structures and procedures to support.

Following on from the various sectorial and national EDI standards is the United Nations EDI Standards (EDIFACT).

It was developed by the United Nations. Is a family of standards similar to ANSI X-12 (The Accredited Standard Committee in 1979). EDIFACT was based on TRADESCOMS, developed by the UK today EDIFACT and ANSI are working towards compatibility.

6.5 EDI COMMUNICATIONS

The EDI standards specifies the syntax for the coding of the electronic document, it does not specify the method of transmission. The transmission of electronic document can be :

- a. A magnetic tapes or diskette that is posted or dispatched using a courier service
- b. A direct data communication link
- c. A Value Added Data Service (VADS), also known as Value Added Networks

Value Added Services

The VADS provides number of facilities by using post boxes and mailboxes to provide time independence and protocol independence. The basic facility of VADS is a post and forward network. For each user of the system there are two files:

- The postbox – where outgoing messages are placed
- The mailbox – where incoming messages can be picked up.

Value Added Networks and Data Services

The basic and most important facility of VADS is the post boxes and mailboxes. The other facilities includes:

- Inter-network Connection
- Access to Trading Community
- Providing International Connection
- Message Storage and Logging

- Privacy, Security and Reliability
- Local Access
- Message Validation
- Software and Consultancy
- User Charges

6.6 EDI SOFTWARE IMPLEMENTATION

EDI software has four layers as shown in Figure 6.2 and these are: (i) business application, (ii) internal format, (iii) EDI translators and (iv) envelope for document managing.

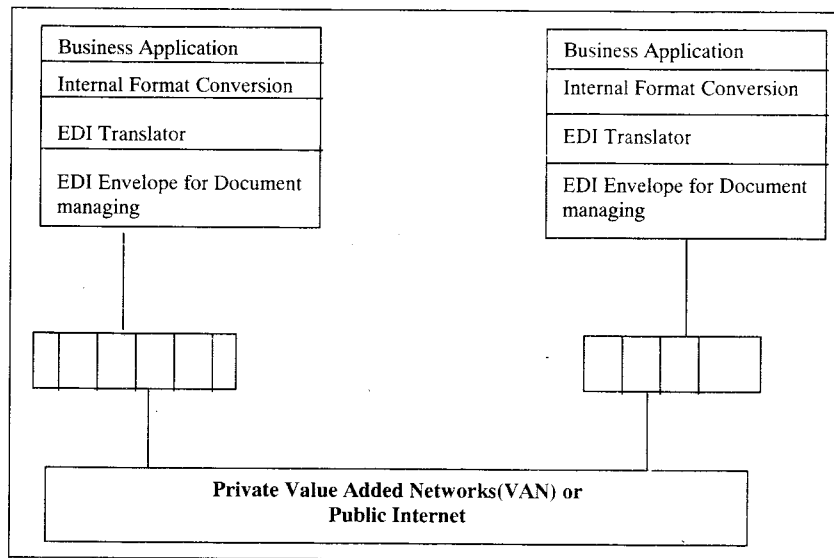


Figure 6.2: Working of EDI

EDI Implementation

The final element of the EDI system is the EDI software. If the items are to be sent to customer. An order from its production and control system to packaging solutions, it needs to be sent in coded manner so that the order is sent in agreed EDI standard and 'squirt' it in to chosen VADS. To pick up the order at the other end, Packaging Solutions has a similar need to extract the data from the network and to decode the data from the EDI message and the interfacing with the VAD is normally achieved using EDI software.

Internet Based EDI

Several Factors makes the Internet useful for EDI and these are:

- Flat Price
- Cheap access with low cost of connection
- Common mail standards and proven networking and Interoperable system.
- Security public key encryption techniques are being incorporated in many electronic systems.

6.7 EDI AGREEMENTS

The partnership agreement should detail how business decisions are made, how disputes are resolved, and how to handle a buyout. This agreement can be helpful if for some reason one of the partners or if someone wants out of the arrangement.

The agreement should address the purpose of the business and the authority and responsibility of each partner. It's a good idea to consult an attorney experienced with small businesses for help in drafting the agreement. Here are some other issues which the agreement addresses:

- How will the ownership interest be shared? It's not necessary, for example, for two owners to equally share ownership and authority. However you decide to do it, make sure the proportion is stated clearly in the agreement.
- How will decisions be made? It's a good idea to establish voting rights in case a major disagreement arises. When just two partners own the business 50-50, there's the possibility of a deadlock. To avoid a deadlock, some businesses provide in advance for a third partner, a trusted associate who may own only 1 percent of the business but whose vote can break a tie.
- When one partner withdraws, how will the purchase price be determined? One possibility is to agree on a neutral third party, such as your banker or accountant, to find an appraiser to determine the price of the partnership interest.
- If a partner withdraws from the partnership, when will money be paid? Depending on the partnership agreement, you can agree that the money be paid over three, five or ten years, with interest. You don't want to be hit with a cash flow crisis if the entire price has to be paid on the spot in one lump sum.

6.8 SECURITY

The first point is to ensure that interchange of messages is reliable. In the first instance, this is a matter of procedures at both ends of the trading agreements. Procedures, rigid procedures, are required to ensure that all the processes are run and that they reach their successful conclusion – an old-fashioned requirement called 'data processing standards'. Procedures are particularly important where operations are manual (as opposed to being controlled by Job Control Programs (JCP) run under the appropriate operating system). Particular attention is needed if the EDI software is run on a separate machine (say a PC) and the application software operates in a mainframe or similar environment; it is vital that all the data received on the EDI machine is passed to and processed (once only!) on the mainframe and that outgoing data is reliably processed in the reverse direction.

Further aspects of security are:

Controls in the EDI Standards

EDI Standards include controls designed to protect against errors in, and corruption of, the message. The sort of thing that is provided is for segment counts in the message and message counts in the interchange.

Controls in the Transmission Protocol

Transmission protocols include protection, such as longitudinal control totals, to detect any data corruption that occurs during transmission. Where corruption is detected the network system occasions a retransmission without the need for outside intervention.

Protection against Tampering

Where there is concern that the transmission might be intercepted and modified it can be protected by a digital signature. This is designed to ensure that the message received is exactly the same as the message sent and that the source of the message is an authorized trading partner.

Privacy of Message

Where the contents of the message are considered sensitive the privacy of the message can be protected, during transmission, by encrypting the data.

Non-repudiation

One potential problem is that the recipient of the message might deny having received it; the electronic equivalent of the idea that the unpaid invoice must have got 'lost in the post'.

One way out of this is to use the receipt acknowledgement messages but the other alternative is a 'trusted third party'. The 'trusted third party' can be the VADS supplier or, if you don't trust them, some other organisation. The role of the third party is to audit trail all transactions (a role the VADS provider is ideally positioned to fulfill) and to settle any dispute about what messages were sent and what messages were received.

One aspect of security provided for by the EDI standard is the receipt acknowledgement message. This is a transaction specific message sent out by the receiving system to acknowledge each message, order or whatever. Trading partners that use receipt acknowledgement messages need to be clear about the level of security (guarantee) implied by the receipt of the acknowledgement.

The EDI acknowledgement message can be:

- Automatically generated by the EDI Software (Physical Acknowledgement). It informs the sender that the message has arrived but there is no guarantee that it is passed to the application for processing or that it is a valid transaction within the application.
- Coded into the application to confirm that it is in the system for processing.
- Produced by the application once the message is processed to confirm that the message was valid and possibly to give additional information such as stock allocation and expected delivery date (Logical Acknowledgement).

The need for security in an EDI system needs to be kept in proportion; after all EDI is very probably replacing a paper based system where computer output orders, without signatures, were bunged in the post and eventually manually keyed in by an order entry clerk. Transmission and EDI message controls are automatic.

Checks over and above that all come at a cost; encryption and digital signatures both require extra software and procedures; message acknowledgements require additional software to generate the message and to match it to the original transaction on the other side of the trading relationship.

EDI orders and invoices for regular transaction of relatively low cost supplies do not justify too heavy an investment in privacy and security - if an extra load of cornflakes arrives at the supermarket distribution centre it can be sorted out on the phone and the error will probably be in the warehouse, not the EDI system (whatever the supplier tells the customer!).

EDI payments require more care; normally the payment transaction is sent to a bank (with its own procedures) with the payment advice being sent to the trading partner.

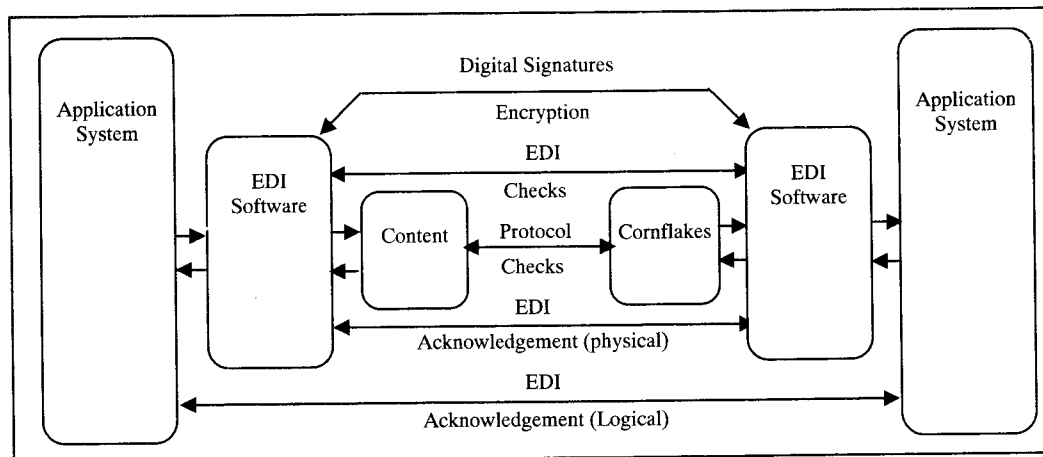


Figure 6.3: EDI Privacy and Security

6.9 PURCHASING ONLINE

Internet shopping brings expediency, a huge range of products and competitive prices. However, reports of troubles mean that some consumers still have major concerns about spending money or giving personal details online.

This page shows you how you can decrease the likelihood of difficulties and what to do if problems arise.

A Guide to Internet Shopping

- Use a website that has been suggested to you by a credible source or one with which you are familiar.
- Make sure that your web browser (the software used to view websites, e.g. Internet Explorer or Netscape Navigator) is set to the highest level of security notification and monitoring (see your manual or click on "Help" in the browser's menu bar).
- Try to use the most new version of your web browser, as it will often include improved security features. Both the Microsoft and Netscape websites offer free downloads of up-to-date versions.
- Be confident to make a record of the supplier's landline phone number and postal address. If these details are unavailable, consider shopping elsewhere.
- Forever keep a copy of the details of your order and the retailer's confirmation message.
- Check all financial offers with the Financial Services Authority (FSA).
- Read the terms and conditions on the supplier's website and in exacting find out what protection is offered in case problems arise.

- Look out for the closed padlock icon at the bottom of the screen; it specifies that your details are being protected when sent. Clicking on the padlock allows you to see if the supplier has an encryption certificate. Only use companies that have this certificate and use secure transaction technology.
- Never reveal your card's PIN number to anyone, including people claiming to be from your bank or the police. Never write it down or send it over the internet.

Check Your Progress

Fill in the blanks:

1. Electronic Data Interchange (EDI) is defined as the communication.
2. EDI is based on a set of standardized messages for the of structured data between computer applications.
3. Internet shopping brings, a huge range of products and competitive prices.
4. EDI Standards include designed to protect against errors in, and corruption of, the message
5. The final element of the EDI system is the EDI

6.10 LET US SUM UP

EDI was developed in early 60s as a means of accelerating the movement of documents related to shipments and transportation. However, from the beginning of 80s it is now widely used in various other sectors like automotives, retails, and international trade. Its relevance and usage is growing at a very fast pace. The EDI standards specifies the syntax for the coding of the electronic document, it does not specify the method of transmission. However, reports of problems mean that some consumers still have major concerns about spending money or giving personal details online. The first point is to ensure that interchange of messages is reliable. In the first instance, this is a matter of procedures at both ends of the trading agreements. Procedures, rigid procedures, are required to ensure that all the processes are run and that they reach their successful conclusion – an old-fashioned requirement called ‘data processing standards’.

6.11 KEYWORDS

FSA: Financial Services Authority

JCP: Job Control Programs

VADS: Value Added Networks and Data Services

ACH: Automated Clearing House

6.12 QUESTIONS FOR DISCUSSION

1. Discuss the EDI architecture.
2. Explain EDI transaction steps.

3. What is meant by EDI?
4. What are the advantages and disadvantages of EDI?
5. What is meant by VADS?
6. What are the benefits of VADS?
7. Compare and contrast between EDI and e-commerce
8. Write short notes on:
 - (a) EDI Communication
 - (b) EDI Agreements
 - (c) EDI Implementation

Check Your Progress: Model Answers

1. interprocess
2. transfer
3. convenience
4. controls
5. software

6.13 SUGGESTED READINGS

Ravi Kalakota, Andrew Winston, *Frontiers of Electronic Commerce*

P.T.Joseph , *E-commerce- A Managerial Perspective*

G.Winfield Treese & Lawrence C.Stewart, *Designing Systems for Internet Commerce*

Kamelesh K Bajaj Debjani Nag, *E-commerce The Cutting Edge of Business*

Dr.Ravi Kalakota, Marcia Robinson, *E Business Road Map for Success*

UNIT IV

LESSON

7

BUSINESS-TO-CONSUMER ELECTRONIC COMMERCE

CONTENTS

- 7.0 Aims and Objectives
- 7.1 Introduction
- 7.2 Business-to-Consumer e-Commerce
 - 7.2.1 Advantages of B2C e-Commerce
 - 7.2.2 Challenges faced by B2C e-Commerce
- 7.3 e-Shop
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- 7.5 Consumer e-Commerce Advantages and Disadvantages
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- 7.6 Let us Sum up
- 7.7 Keywords
- 7.8 Questions for Discussion
- 7.9 Suggested Readings

7.0 AIMS AND OBJECTIVES

After studying this lesson, you will be able to:

- Explain the business-to-consumer electronic commerce
- Discuss the e-shop
- Describe the e-commerce technologies
- Identify and explain the advantages and disadvantages of consumer e-commerce

7.1 INTRODUCTION

It refers to exchange between business and consumer, e.g., Amazon.com, Yahoo.com etc. Business-to-consumer (B2C, sometimes also called Business-to-Customer) describes activities of businesses serving end consumers with products and/or services.

An example of a B2C transaction would be a person buying a pair of shoes from a retailer. The transactions that led to the shoes being available for purchase, that is the purchase of the leather, laces, rubber, etc. as well as the sale of the shoe from the shoemaker to the retailer would be considered (B2B) transactions.

7.2 BUSINESS-TO-CONSUMER E-COMMERCE

Businesses selling to the general public usually through catalogs utilizing shopping cart software. By dollar volume, B2B takes the prize, however B2C is really what the average Joe has in mind with regards to ecommerce as a whole.

Having a hard time finding a book? Want to purchase a custom, high-end computer system? How about a first class, all-inclusive trip to a tropical island? With the advent ecommerce, all three things can be purchased literally in minutes without human interaction. Oh how far we've come!

B2C (Business to Consumer): Refers to a business communicating with or advertising to an individual rather than a company. B2C e-commerce jumped from \$11.2 billions in 1998 to \$31.2 billions in 1999,

Doing business online no longer necessitate a huge investment by retailers, thanks to developments in template-based online stores which are based on packaged applications that are delivered over the internet.

As almost all online stores will require the same functions: catalogues, order baskets, payment processing, content management and member management, it makes sense for those components to be created once and shared by all stores, with each store effectively 'renting' its own copy of the applications.

The one area where it's significant for online stores to differentiate is their look and feel, and naturally retailers feel very strongly about their business branding. So the ability to create a unique 'skin' for each site is an important part of a template-based e-store offering.

Using the most recent internet application technology, individual sites can be created within minutes of the retailer selecting a template and supplying graphics such as logos. Typically, retailers will pay only a modest monthly rental charge – and retailers require no specialist hardware or software, other than internet access.

Anyone who needs to sell products and services over the internet, or who wants customers to be able to research their purchases on the internet, should consider an online store.

These days, a web site should be a typical part of the promotional and advertising mix for every business, along with other tools such as Yellow Pages, newspaper advertising and signage.

7.2.1 Advantages of B2C e-Commerce

B2C e-commerce have the following advantages:

- Shopping can be quicker and more convenient.
- Offerings and prices can change immediately.

- Call centers can be incorporated with the website.
- Broadband telecommunications will improve the buying experience.

7.2.2 Challenges faced by B2C e-Commerce

The two main challenges faced by B2C e-commerce are constructing traffic and sustaining customer loyalty. Due to the winner-take-all nature of the B2C structure, many smaller firms find it difficult to enter a market and remain competitive. In addition, online shoppers are very price-sensitive and are easily lured away, so acquiring and keeping new customers is difficult.

A study of top B2C companies by found that:

- Top performers had over three times as many inimitable visitors per month as the median. In addition, the top performer had 2,500 times more visitors than the worst performer.
- Top performers had an 18% conversion rate of novel visitors, twice that of the median.
- Top performers had revenue per transaction of 2.5 times the median.
- Top performers had an standard gross margin three times the median.
- There was no important difference in the number of transactions per customer and the visitor acquisition cost.

One of the things that you are going to need to think about as you open a B2C ecommerce company - a business that makes sales to general consumers rather than other businesses - involves what you can *do to attract the right customers to your web site*. After all, just having a product isn't enough; neither is having a product and a static web site that does nothing to make consumers take notice. In order to create and launch a successful B2C e-commerce company, there are a number of things to keep in mind.

As you launch your B2C e-commerce company, you're going to desire to think about:

- The greatest reward that the product or service you are selling has to offer.
- The kind of customers who will have an interest in the product or service that you have to offer.
- The demographic information for your best customers so that you can decide whether you should be marketing your products and services to one specific audience or you should take a closer look at establishing separate web sites for different target audiences.
- The motivations that have led your best customers to make a buy in the past.
- The desire that drives your current customers to come back to your business and make repeat purchases.
- The reasons why your present customers want to talk about the products and services that your company offers.

The more that you are able to look beyond merely the product or service that you have for your business, the more that you are going to find that you have a lot of control. By knowing whom your best customers have been and are, by creating a clear, targeted marketing message and making your B2C e-commerce company web site accessible to those in your target market, you will find that you can simplify the way that you interact with your prospects.

When you know that you are able to reach out to the right projection, you'll find that it's much easier to communicate your key ideas. By staying on message, you'll find that you are able to do more to engage your target audience, the more that you get your best prospects asking questions and thinking about the answers, the better the position that you will be in to make the sale. When you know that your customers and prospects are interested in what you're saying and what you have to offer, you will find that you are in a much better position to attract an additional audience to your product or service.

In other words, in order to ensure that you are able to create a winning B2C ecommerce company, you need to be sure that you are looking at your target audience and creating a marketing message that speaks directly to that audience. The more that you are able to target your message and to keep your clients coming back, the more that you are able to get them to help spread the word, the faster that your business will become successful.

7.3 E-SHOP

Online shopping is the process whereby consumers openly buy goods or services from a seller in real-time, exclusive of an intermediary service, over the Internet. If an intermediary service is present the process is called electronic commerce. An online shop, eshop, e-store, internet shop, webshop, webstore, online store, or virtual store evokes the physical analogy of buying products or services at a bricks-and-mortar retailer or in a shopping mall. The process is called Business-to-Consumer (B2C) online shopping. When a business buys from another business it is called Business-to-Business (B2B) online shopping. Both B2C and B2B online shopping are forms of e-commerce.

Opening an e-Shop

Internet came into our lives as certainly as electricity. It conquers more and more hearts for it by its speed and versatility, by its possibilities that seem to be boundless. We move more and more parts of our lives from off-line to on-line. But human brain is never ready to accept something completely new; it is intended to search for familiar features in everything. That is why majority of things that were moved to on-line world still bear properties of their firm prototypes, even if they are purely conventional. On-line shop is not an exception. The functions are the same. And expectations of customers are basically the same. You are curious what they expect from e-shop. Let's think together. I am sure, my dear reader, you played a part of customer hundred times. What is important for you when you choose the shop?

Place and Accessibility

Managers who plan building of a shop pay much consideration to its location. They care about the roads that will lead potential customers to it. The whole lot shall be done so that more people could get inside and see the goods to be bought. Why do not managers of e-shop think in the same way? Trust me, good managers do think.

What are on-line analogues of that? Roads of Internet are not enigmatic. The location of e-shop is the cross-road of links that lead to it. The more they are close to thoroughfares the better. The user will eagerly visit a shop that is close to his habitual path, i.e. to the links that are familiar for him. He does not want to wander for hours or to remember a complicated path. He wants to get into the shop with minimal effort, maybe one click. What are habitual paths for a customer? As for me the first place I go when I want something is www.google.com. I just search for an item I want to buy and go to the first

shop I find. It is natural for any customer to enter the first shop he sees. What are other paths that can lead me to the shop? Ask yourself where I may go regularly and you will get your answer. Being an ordinary user I go to check my mail-box each day, then I go to see recent news and after a little hesitation allow myself to read couple of articles that interest me and discuss them with my friends through some kind of messenger like Yahoo or whatever is available. If I see any information about goods that interest me on either of those pages I will surely go and see the details. That leads creators of e-shop to an obvious idea of locating their advertisement and references on mail sites, news sites, on message windows of messengers, and also on the sites that attract the interest of target group of customers.

Conclusion 1: The higher is position of e-shop in a hunt list the more customers it can attract.

Conclusion 2: Investigate the target group and place your orientation on the sites that attract it.

Conclusion 3: Show a bit of sympathy to your customers and imagine where it would be convenient to find a reference to an e-shop.

Sign-board

There are thousands of shops in modern city and billions of them on the Internet. Customer cannot enter each of them. Even if the shop is on his way he may pass by without paying any attention. Something shall attract him. The sign-board shall contain information that would make the customer think “Hey, that is right what I was searching for!” or “Hey! That is interesting”. It can be the name and design or a brief sentence about the content, but necessarily something eye-catching. From the other hand it shall not be irritating or tasteless or promise something that can not be found in this e-shop. What is sign-board for an e-shop? The lines of the search system, the banners, advertisement on other sites, head of the home page etc. The above expectations are valid for either of those items.

Conclusion 1: The major criterion of a good sign-board is attractiveness and appropriateness.

Design

Customer agreed by, saw your sign-board and decided to enter your shop. What does he expect to see? He wants to see a clean and airy room with quiet atmosphere so that he could examine goods and take decision calmly. All this implies that the design of e-shop shall be clear enough, without anything that irritates customer’s eyes with too bright colors or unreadable texts, or constant blinking.

Sometimes the designers not remember about the main objective and the shop-keeper gets a richly decorated room where his goods look humble and stay unnoticed. The same sometimes happens to sites, when the content is lost behind sophisticated design. The objective is to sell something, so the design must emphasize attractiveness of goods without becoming the end in itself.

Also the one wants to find the items he needs rapidly, get information about the goods, see the price and turn to a hospitable shop assistant if he needs help. So the designer shall think about comprehensive order of grouping goods, for example, by categories and by alphabet inside the category. A search tool will be helpful if the range of goods is waste. Description of each item is extremely important, much more than in real world. Here description provided is the only thing that forms customer’s opinion about the item. Information shall be sufficiently complete, yet brief and attractive. Also it shall be true because no one wants to buy something damaged or inappropriate. And if this happens it brings losses to the shop anyway. If all information given does not satisfy the customer and he wants more he might seek for support. So providing his e-Commerce online store with possibility to ask all his questions would be quite a reasonable thing.

- Conclusion 1: The design shall be inclusive and pleasant for the eyes.
- Conclusion 2: The customer shall find goods among others exclusive of any problem.
- Conclusion 3: The information about the goods shall be attractive, sufficient, true and easily accessed.
- What is the common principle of shop building, business and any other activity that deals with people? Ask yourself what they might want and try to give that to your customers. This simple idea seems to be obvious, yet everyone who uses it right enjoys gratitude of clients and success of his business.

7.4 E-COMMERCE TECHNOLOGIES

Some of the technologies used to implement the e-commerce

1. Convenient storage and retrieval of information about products and customers require a database. Some terminology: A database is a collection of data organized in such a way that it can be easily accessed, managed, and updated. A query is a request to a database written in a form that's supported by the database. Every brand of databases has its own language of queries (a query language).

A well-organized database allows you to store each piece of information only once, so if you need to change it, you change it in one place. Databases allow you to store information about orders, needed both for you and for customers. For instance, customers can track their orders by requesting information from the database, which will automatically reply whether the order has been shipped. You can use customer information to fill in forms for returning customers with their recorded information. You can store statistics about customers (how many times they have visited the web sites, which pages, what did they buy, and so on). Customer's feedback about products can be organized and displayed later when someone else is interested in the same product. It's hard to imagine an interesting web site that does not have a database behind it.

There are various kinds of databases, from a simple one, which is a collection of "flat" files storing data, to very sophisticated commercial products, s.a. ORACLE. The most common kind is a relational database.

A relational database is a database organized as a collection of tables.

In this course module we will use a simple relational database called McKoi database.

2. A convenient interface to the database from the web site. A customer does not need to know anything even about the existence of the database, not to mention details of its organization. He/she should be able to get all necessary information by typing in keywords and filling in electronic forms.

Various programming languages (for instance, Java, JavaScript) provide libraries to implement a remote connection to a database server.

A server is a computer that provides a remote access to some service, for instance a web page server "serves" web pages, i.e. sends HTML files, graphics files, etc. in response to http requests, a database server provides responses to database queries, and so on. One machine can provide several different services at the same time.

A client is a computer that makes a request for a service.

We will use a Java JDBC (Java Database Connectivity) package to facilitate a connection to a relational database. It does not depend on a particular kind of the database, as long as the database supports SQL (Structured Query Language).

SQL is a standard for a query language of a relational database.

An interface has to provide way for customers to fill in forms, press buttons, etc. We will use javax.swing package to build an interactive graphical interface.

3. We need to be able to process user's forms, for instance order forms, and produce various web pages, depending on the request. Ways of processing electronic forms include various server-side scripts, s.a. CGI, PERL, asp (Active Server Pages, an extension of JavaScript) and others. We will use Java Servlets for this purpose.
4. A web site responds to requests for web pages. It doesn't "know" where the requests have come from, so it can't tell if two requests for web pages have been made by the same user. To keep track of a user during a session (and sometimes between sessions), a web server uses cookies.

A cookie is a small text file placed by a web server on the client machine. The file gets sent back every time the client requests a web page from the server. A cookie has an expiration time, which may be just for the session or longer.

Java Servlet package also implements cookies.

5. Encryption and Security. A common way secure communications are implemented is via SSL (Secure Sockets Layer), which allows various forms of encryption, depending on the maximum level of encryption provided by the server and the client and on geographic location of the machines (a different level of encryption is allowed in the US for connections to domestic and foreign computers). We will study and compare several encryption algorithms. On the practical side, we will use Java packages which implement encryption and secure communications.
6. Electronic Payment Systems are based on customer's accounts with one of trusted vendors. A customer obtains certificates "signed" by the vendor which are analogous to checks ("personal money") and cash ("anonymous money"). The implementation should be such that mere copying of any piece of information transmitted in the transaction does not allow the thief to use the "money". We will study protocols for verifying validity of "checks" and "cash" in electronic transactions. We will also study ways of implementing "coins" on the Internet, i.e. certificates for small amounts of money (this allows some shortcuts in implementation, since the process of breaking even a simpler protocol may not be worth the money stolen).

7.5 CONSUMER E-COMMERCE ADVANTAGES AND DISADVANTAGES

7.5.1 Advantages for the Business

- Can reach worldwide market with unlimited volume of customers.
- Can display information, pictures, and prices of products or services without spending a fortune on colorful advertisements.
- In some cases, makes order processing a easier task than before.
- Can operate on decreased, little, or even no overhead.

7.5.2 Disadvantages for the Business

- The competition is so vast on the web. There can literally be thousands of places a customer can go to purchase the same product that you offer.
- Technology problems can cause you site to not operate properly, causing you to loose customers and sales.
- The payment plans. Getting people to look at your site is one thing, getting them to type in their credit card information is another.

7.5.3 Advantages for the Consumer

- Convenience. Consumers can shop at any time of day, from the privacy of their own home. The internet has been called “the mall that never sleeps.”
- So many choices – Consumers can shop for basically any item they can think of! Airline tickets, groceries, clothing, and even medicine!
- Less Hassle – Consumers can shop online without dealing with annoying sales people, fighting the congestion of shopping malls, and driving 10 different places to find one thing.

7.5.4 Disadvantages for the Consumer

- *Security Issues:* Probably the number one reason why people do not purchase online. Credit Card information is very sensitive and must be handled by someone the consumer can trust. Scams, frauds, and rip-offs are not uncommon on the web.
- *Customer Service:* Consumers are not always satisfied with their purchases, and when buying online they often don't get the answers they need in a timely manner they demand.

Check Your Progress

Fill in the blanks:

1. Businesses selling to the general public typically through catalogs utilizing shopping.....
2. The two main challenges faced by B2C e-commerce are building and sustaining customer loyalty.
3. A database is a collection of data organized in such a way that it can be easily....., managed, and updated.
4. A common way to secure communications are implemented is via

7.6 LET US SUM UP

Businesses selling to the general public typically through catalogs utilizing shopping cart software. By dollar volume, B2B takes the prize, however B2C is really what the average Joe has in mind with regards to ecommerce as a whole. Online shopping is the process whereby consumers directly buy goods or services from a seller in real-time, without an intermediary service, over the Internet. If an intermediary service is present the process is called electronic commerce. Some terminology: A

database is a collection of data organized in such a way that it can be easily accessed, managed, and updated. A query is a request to a database written in a form that's supported by the database. Every brand of databases has its own language of queries (a query language).

7.7 KEYWORDS

B2C: Business-to-Consumer

SSL: Secure Sockets Layer

ASP: Active Server Pages

JDBC: Java Database Connectivity

SQL: Structured Query Language

7.8 QUESTIONS FOR DISCUSSION

1. Explain business-to-consumer e-commerce with an example.
2. What is e-shop? Write the processor to open an e-shop.
3. Discuss the e-commerce technologies.
4. What are the advantages and disadvantages of e-commerce consumer?

Check Your Progress: Model Answer

1. cart software
2. traffic
3. accessed
4. SSL

7.9 SUGGESTED READINGS

Ravi Kalakota, Andrew Winston, *Frontiers of Electronic Commerce*

P.T.Joseph , *E-commerce- A Managerial Perspective*

G.Winfield Treese & Lawrence C.Stewart, *Designing Systems for Internet Commerce*

Kamelesh K Bajaj Debjani Nag, *E-commerce The Cutting Edge of Business*

Dr.Ravi Kalakota, Marcia Robinson, *E Business Road Map for Success*

LESSON

8

INTERNET CONCEPTS

CONTENTS

- 8.0 Aims and Objectives
- 8.1 Introduction
- 8.2 Internet
- 8.3 Internet Concepts
- 8.4 TCP/IP
 - 8.4.1 TCP/IP Protocols
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- 8.7 Let us Sum up
- 8.8 Keywords
- 8.9 Questions for Discussion
- 8.10 Suggested Readings

8.0 AIMS AND OBJECTIVES

After studying this lesson, you will be able to:

- Explain the internet concepts
- Discuss TCP/IP
- Describe the uses of internet
- Discuss the internet age systems

8.1 INTRODUCTION

Internet is the name for a vast, worldwide system consisting of people, information, and computers. It is so huge and complex that it is beyond the comprehension of a single human being.

The roots of the Internet lie in a project called the ARPANET, which was sponsored by the United States department of defence–Advanced Research Projects Agency (ARPA). The department of defence was interested in building a network that could maintain itself under adverse conditions. (A network is simply two or more computer connected together).

The project was started in 1968 and soon evolved into a more general goal of developing techniques to build a large-scale network. ARPANET continued for years and was gradually phased out after having been officially declared completed. By then the technology to connect computers reliably and economically had been developed and today the ARPANET's spiritual descendents form the global backbone of what we call, Internet.

The Internet refers to millions of computers connected to a gigantic network and communicating via TCP/IP protocols. A protocol is a pre-defined way for a computer to communicate with another computer, for instance when requesting a service, an FTP service, or when forwarding some information to another machine. Each computer at any given time has a unique address on the Internet. This is its IP address.

8.2 INTERNET

This technology was originally developed by scientists as a tool to keep in touch with one another. This is the way many of us use it even today.

The Internet is an unprecedented gateway to a vast wealth of knowledge and information, and its uses are virtually unlimited. The World Wide Web, although still young, is deeply ingrained in our culture and everyday lives. It's a source of news, facts, and figures; a communication tool that allows millions of us to connect with each other every second of every day; a way to bank, invest, and shop; and an educational and entertainment medium that allows people from all walks of life to learn about the world and have fun doing it.

The application of internet has spanned individual enterprises, business, government across the globe today. On the individual side it has provided them the power they never had in the past and they are enjoying it. Instead of rushed phone calls or the occasional letters/notes one can exchange message across the globe at a negligible cost, the regular updation of knowledge. On the enterprise and business end it has helped in providing IT enabled solutions like e-commerce, Enterprise Resource Planning (ERP) etc.

Closed enterprise systems are giving way to open system environments, where customers connect to the company's Web site, and trading partners connect by an Extranet and the Internet.

Internet is a gigantic computer network of many different computers. It consists of millions of smaller domestic, academic, business, and government networks, which together carry various information and services, such as electronic mail, online chat, file transfer, and the interlinked web pages and other resources of the World Wide Web (www).

This network is spread all over the World. It is collection of interconnected networks. Hence it is called "inter network" or in short "Internet". One can communicate with any other internet subscribers throughout the world through an Internet connection. Many companies including VSNL, Essar, Bharti Telecom, and MTNL provide Internet service in India. They are also known as Internet Service Providers (ISP).

The internet system is based on programmes called “clients” and “servers”. A programme that provides a service is called a server. A programme that requests a service is called a client. The whole network is one large client/server system.

Any individual or organization can open an account with any Internet Service Provider (ISP) who will give an Account Number for monthly or yearly fees. Then the user may have access to the Internet and the e-mail through it. The user needs a computer, "modem" and a telephone line to access the Internet. In the user computer client programmes are required. Those client programmes carry out the commands by passing data back and forth to server programmes. A server programme might be in the next room, across the country or on the other side of the world. He can send and receive mails, surf to the World-Wide Web (www) or access his bank account through internet.

The Web is not internet. At times, people confuse the two terms that are related but not identical in meaning. The Internet is a collection of interconnected computer networks, whereas the Web is a collection of interconnected documents and other resources, linked by hyperlinks and URLs.

The World Wide Web is one of the services accessible via the Internet, along with various others including e-mail, online chatting etc. When you are on the Web, you are on the Internet but not the other way round. For example, those sending e-mail are not on the Web, unless they are sending e-mail via a Web browser.

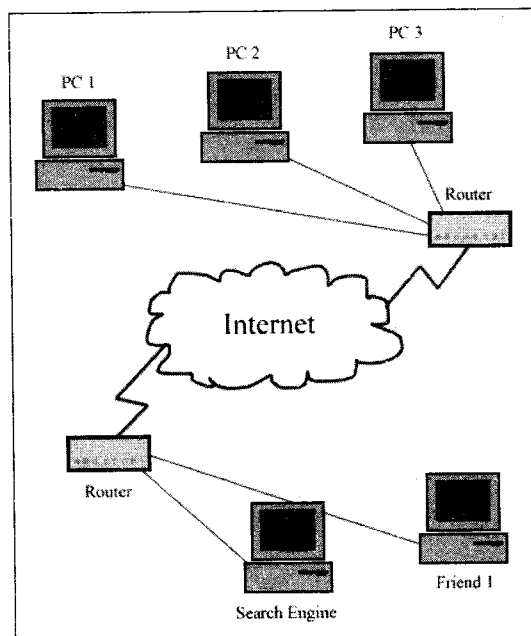


Figure 8.1: Internet

8.3 INTERNET CONCEPTS

IP Address

If you want to get connected to another computer, you need to know the computers address. An IP (Internet protocol) address is an identifier for a particular machine on a particular network; it is part of a scheme to identify computers on the Internet. An IP member consists of four sections separated by periods. Each section contains a number ranging from 0 to 255. For example 202.50.2.3

These four sections represent both the machine itself and host, and the network that the host is on. The network portion of the IP address is allocated to Internet Service Providers (ISPs) by the interNIC, under authority of the Internet Assigned Numbers Authority. ISPs then assign the host portion of the IP address to the machines on the networks they operate.

They are 5 classes of IP addresses. Class A, class B, Class C, Class D, and Class E. The IP addresses have the following characteristics in common:

- IP addresses are unique
- All machines connected to the Internet agree to use the same scheme for establishing an address.

Hypertext

Although the World Wide Web uses the Internet, the web is based on another concept entirely. That concept is hypertext, and is referred to in the names of the standards and protocols that the World Wide Web uses, i.e. Hypertext Markup Language (HTML) and Hypertext Transfer Protocol (HTTP).

Hypertext explores the idea that electronic documents, unlike paper documents, don't have to be static. When you ran across an interesting work or concept in a printed newspaper article, for instance, you must go to a dictionary or encyclopedia or library to look up the references yourself. The most the article can do is to cite these references in footnotes.

However, if a hypertext article is displayed for you on a computer screen, the computer can bring the references right to you. Instead of merely giving the reference name, the hypertext article contains pointers to a web of interrelated documents; each with links to move and cut ideas with similar subjects or examples. To access these documents, all you have to do is click the reference.

In the initial years, the web pages used to be static pages. It was limited to interlining of various text-based documents. Then new technologies came and due to these, web pages can be made more dynamic e.g. Displaying different quotation each day on the web page, the colour of the web page changes after each minute, a graphical counter displaying no. of hits on the site, etc. The client side dynamism is provided by:

- **JavaScript:** A scripting language based on the syntax of Java. JavaScript was created by Netscape.
- **Jscript:** A scripting language by Microsoft. It can be called as a Microsoft's version of JavaScript.
- **Vbscript:** This scripting language was created by Microsoft base on the syntax of visual basic only. Internet explorer supports vbscripts.
- **ActiveX:** These are the controls given by Microsoft. ActiveX is only supported by Microsoft browsers (e.g. Internet explorer). ActiveX is the technology for extending the user interface capability of HTML and scripting languages. ActiveX controls such as buttons, pick lists, menus, and check boxes allow you to embed controls in your HTML forms that make them look like windows applications.
- **Java applets:** These are small applications that run inside the web browsers. The only drawback with Java applet is that it takes a lot of time to download. This makes navigating the web site, containing applets, a bit slower.

The server side dynamism is provided by:

CGI: A standard for starting programmes on the web server computer that returns dynamically created HTML documents to the HTTP service for transmission to the remote client. CGI stands for Common Gateway Interface. The popular languages, in which CGI scripts are written, are PERL, C and C++.

Java servlet: Servlets are the server-side application written in Java. The major advantage of using Java application is that it can run on any platform. Java can run on any machine. Also Java is similar to many industrial programming languages except that it is not compiled to the native machine language of the target computer.

ISAPI: ISAPI stands for Internet Server Applications Programming Interface. Microsoft developed the ISAPI to make dynamically generated web pages.

ASP: ASP stands for active server pages. ASPs are HTML pages that contain scripts written in Vbscript or Jscript, as well regular HTML text. ASPs have the extension .asp.

The World Wide Web protocol (HTML, HTTP) allow any Internet site to provide (or host) web pages. Any page can refer to any other web page, even without the knowledge of the other page. The World Wide Web is the most visible Internet tool today. It presents information textually as well as graphically and turns the Internet into an information resource and marketing tool unlike any other. You can use the web to search for product information, download changes to software and firmware, keep abreast of information published in electronic newsletters, research any subject from auto mechanics to zoology, and much more.

Uniform Resource Locator

URL stands for Uniform Resource Locator, which is simply an address of a document on the web or, more accurately, on the Internet. Although a URL can look complex and long, its made up of four basic parts-protocols, host name, folder name, and file name-each of which has a specific function.

E.g. <http://www.webconnet.com/virtual/index.html>

All URLs follow this format regardless of the service being used or the document being retrieved.

Protocol: The first element in the URL is the protocol. This is the service that provides the resource, followed by a colon. The default taken is http: if you don't specify other service. The protocol specifies the computer language used to transfer information. Specifically, a protocol tells the browser where the information is located (for example, on a web server, an FTP (File Transfer Protocol) server, a local hard drive, and so on). The protocol tells the browser what to expect from the document retrieval process.

Protocol	Use
http://	For HTML documents and associated files on the web.
ftp://	For documents on the FTP server
Gopher://	For documents on the Gopher server.
telnet://	To open a telnet connect to a specific host.

Host Name: Host name is the server that contains the resource, preceded by two slashes (either in the form of a domain name or an IP address). In other words the hostname is the name of the server that holds HTML documents and related files.

For example, in the previous example, the hostname is `www.webconnet.com`.

Folder name: Folder names give document on the servers file system. Folders perform the same function on a web server that they perform on your PC (i.e. they organise documents). There's virtually no limit to how deep you can nest folders, and there's no limit as to what files the folders can contain.

File name: File names are the names of specific documents. It identifies the file (an HTML document, an image, a text file, and so on) to be displayed. In the above example, the file `index.html` is displayed. This file is kept in the folder `virtual`.

Web Browsers

Web browsers are applications that retrieve content in the form of HTML from web servers. Browsers keep track of the users input actions, for example, clicking buttons or selecting links-and executing those actions.

By 1992, the basic idea of hypertext-data containing links to other data had been explored and was widely accessible on the net. However, the number of people using the web was still small. This was because the principal web client programmes ran under text-based Unix systems and were awkward to use.

This all changed in 1993, when Mark Andersen, then a student at the University of Illinois, released a new programme called Mosaic. Mosaic was the original graphical web browser. Mosaic used the original text web browser, Linux as a model. After the release of Mosaic, the popularity of the World Wide Web exploded. Mark Andersen formed a new company Netscape and released Netscape navigator.

After the release of navigator 2, Microsoft woke up to the Internet and realized the vast potential of this entirely new market. In short time the company released Internet explorer, which in its original version wasn't very compelling.

Other web browsers were spry Mosaic, Lynx, HotJava etc. Spry Mosaic is a licensed descendent of NCSA Mosaic. Spry has licensed it for use as the CompuServe web browser. Lynx is the original text only web browser developed at CERN to support only pure HTML. HotJAVA is a web browser that Sun wrote entirely in Java as a demonstration of the programming power of the Java language.

Netscape communicator (initially called as Netscape navigator) and Internet explorer are the two browsers that are most popular. Regardless of which browser you use, web browsers may support some or all of these features:

- Bookmarks for favorite web sites
- Multiple browsing windows
- Frames or multiple views within a window
- Secure data transmission
- Java and other languages support
- Web interface to FTP and Gopher Internet sites.

Domain Name

A domain name is a way to identify and locate computers connected to the Internet. No two organisations can have the same domain name.

A domain name always contains two or more components separated by periods, called “dots”. Some examples of domain names are: www.nasa.gov, netscape.com, tcs.co.in, etc.

The top-level portion of a domain name describes the type of organisation holding that name. The major categories for top level domains are:

- Com–commercial organisations
- Edu–educational institutions
- Net–organisations involved in internet operations
- Org–miscellaneous organisations e.g. non-profit groups, etc.
- Gov–united states federal government entities
- Country codes–a two letter abbreviation for a particular country. For example, “in” for India, “uk” for United Kingdom or “fr” for France, etc.

Internet Service Providers

Internet Service Providers are companies that connect you to the Internet. These companies form the backbone of the Internet.

In order to access the Internet using your phone line, you will need to establish an account with an Internet service provider. To start service, you will have to register with that provider and choose either a TCP/IO or shell account or both. Once you register with an ISP, you get a user name, a password and phone number(s) to dial. You can change your password whenever you may want to. To establish and get connected to the Internet, your communications programme dial the Internet access number. Once you get connected, a window will prompt for your username and password. After you enter your user name and password, you get connected to the world of Internet.

Choosing an ISP is an important decision. There are many factors based on which you choose your ISP. For example, at present the ISP’s in Delhi are Mantra Online, VSNL and Satyam. ISP’s vary in their services, price, hour’s package, etc. One ISP may be offering better services but charging more for each hour of Internet access. Here are certain points to consider before going in for a particular ISP.

- If it’s service can be accessed with a local phone call.
- Is the prices are competitive.
- Does the provider have enough phone lines.
- Does the service provider offer full internet access.
- Is the connection fast enough.
- Does he provide you space for launching your own web page.

The ISPs offer a variety of services like:

- Linking consumers and businesses to the Internet (e.g., America Online, VSNL, Ernet, Microsoft Network, CompuServe)
- Network management and system integration
- Monitoring and maintaining customers' Web sites

- Backbone access services for other ISPs like PSI, BSNL, and UUNET
- Payment systems for online purchases.

Initially the cost of Internet access was high, however with the increase in traffic the costs are coming down. Many governments are funding the use of the internet because of its political, education and commercial benefits. The internet provides variety of information almost free except those which are membership based.

One can contact anyone, anywhere, anytime for a monthly fee. The exceptions are web sites that charge a membership fee or a fee for access to privileged information. Almost everything one needs on the Internet is free. Among the free services are:

- Hotlist that tell the user what is popular and what is not.
- Comics that focus on entertainment events.
- Software archives that list the latest free software available.
- Weather services that provide free weather forecasts anywhere in the world.
- Magazines and broadcasting stations that constantly update the news.
- Searchers that help locate items or subjects on the Internet.
- Dictionaries that include thesauruses and "fact" books on almost all subjects.
- Government services that publicize what is available from them.

The problem for ISPs is sudden growth without advance planning to accommodate that growth. Accordingly, response time slows down, triggering customer complaints. The challenge to them is to maintain profitability and meet or beat the competition, while maintaining customer satisfaction. To do all this well requires professional management, a highly skilled technical staff, and a healthy budget to bring the technology in line with the voracious appetite of today's consumer. The trick is to ensure a balance between creativity and control and between managing growth and a stable technical infrastructure.

Server

A server is the ultimate destination point on the Internet. It is where the information you are seeking is stored. When you send a message to retrieve a piece of information through the Internet, the browser picks up the message, reformats it, and sends it through various layers to the physical layer where cables and wires transmit the message to the appropriate server. Once there, the server retrieves the information and sends it back to the browser to be viewed by the user. There are various kinds of servers, depending on the information sought by the user. Since most of the focus in this book is on the World Wide Web, we will use the word "server" to refer to WWW servers.

Browser

A browser is a software programme loaded on a PC which allows to access or read information stored on the Internet. It is the vehicle that enables you to interface with the Internet. The browser takes your instructions and converts them into a language and a format that can be sent to a remote site and executed.

Security Protocols

There are two main security protocols. The first is Secure Sockets Layer (SSL) – a protocol for transmitting private information in a secure way over the Internet. Developed by Netscape

Communications Corporation. To date, it is the most widely used security protocol on the Internet, providing security services for messages or streams of data. The second security protocol is S-HTTP secure HTTP (S-HTTP): an extension to HTTP that provides various security features such as client/server authentication and allows Web clients and servers to specify privacy capabilities.

Telnet

An Internet service that allows a visitor to access remote computers as if they were local. Telnet is a basic Internet service that allows you to access remote computers as if they were local. To use Telnet, you must have the Internet address of the remote computer. Once you transmit the computer address, you are asked to login before being allowed to access computer files or use the computer. Login entering your user name and password. Once logged in the information you read and actions you take are acted upon by the remote computer.

Bulletin Board Systems (BBS)

BBS is a computer based meeting and announcement system that allows local people to exchange information free of charge. People often confuse Bulletin Board Systems and pay services. A BBS generally has a simple interface to the Internet for users to access services like e-mail and NetNews. By calling a BBS via your PC, you can locate all kinds of information. The e-mail part of this system, for example, accepts e-mail during the day, compiles it, and sends it once or twice a day as a batch. It also receives incoming e-mail the same way. This is probably satisfactory service for small-time users or those with no time requirements. An alternative type of BBS is service by subscription. These systems are so popular that system owners have added better computer hardware, better storage, more phone lines, etc. The cost of keeping the system current requires users to pay a set fee per month. Pay services like America Online and Prodigy have become household names, offering millions of users access to popular telecommunication offerings that include stock quotes, Internet access, setting up your stock portfolio, and other specialized services.

Many pay services follow a similar procedure. First, you subscribe at a fee, which covers basic access to the service. The fee allows you to do e-mail, interactive real-time communication, watch the news, and the like. Pay services offer other options that are hard to get on the Internet. For example, a live news feed and free online (no delay) stock quotes are available at a membership fee; some are free. Security software is also included to ensure privacy, confidentiality, and integrity of the exchange process.

e-mail

Electronic Mail or e-mail is a system of electronic correspondence by which users send and receive messages over a network of computer and telecommunication links. The messages may consist of short notes and greetings, or extensive (huge) text files plus graphics (drawings) and photographic images, video clips, or sound. Thus, e-mail is an "electronic post office". It provides a "store-and-forward" service. It lets people communicate even in the absence of the receiver at the other end. It means that you can send e-mail message whenever you want. The person to whom you have sent the message, can read them (after opening his computer) whenever he wants. Thus, the sender and the receiver don't have to connect themselves at the same time to communicate.

The ability to compose send and receive electronic mail is enormously popular on the Internet. Many people use this as the primary way of interacting with the outside world. Electronic mail eliminates most of the problems and delays of getting a physical document from one person to another. The message becomes available to the addresses as soon as it is sent. Unlike telephone call, both parties need not be available simultaneously for communication to succeed. Some electronic mail packages have an

interoperability services between computers of all sizes, regardless of the hardware or operating system platforms supporting them. Over the years, TCP/IP has become the most widespread of today's protocols. One reason for TCP/IP's popularity is the public availability of its protocols' specifications. In this sense, TCP/IP can justifiably be considered an open system. Most users rely on TCP/IP for the purpose of file transfers, electronic mail (e-mail), and remote login services.

8.4.2 IP Protocol

In contrast to TCP, it is a connectionless type service and operates at third layer of OSI reference model. That is, prior to transmission of data, no logical connection is needed. This type of protocol is suitable for the sporadic transmission of data to a number of destinations. It does not have such functions as sequence control, error recovery and control, flow control but it identifies the connection with port number. The IP datagram has a header of 20-byte fixed size and a text of variable length optional parts. The header format of IP datagram is depicted in Figure 8.2. The header format is transmitted from left to right, with the high order bit of Version field is transmitted first.

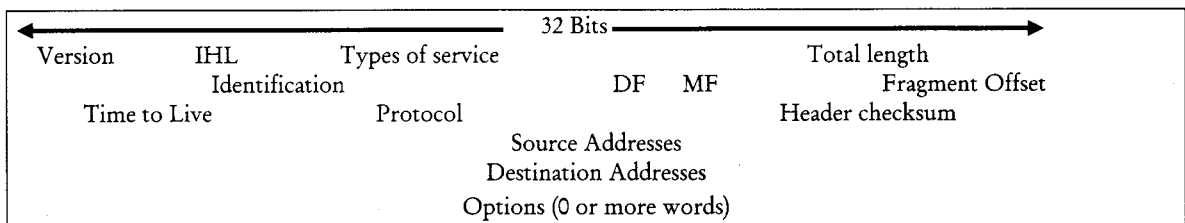


Figure 8.2: IP (Internet Protocol) Header

Data encapsulation adds the IP header to the data. The IP header consists of five or six 32-bit words; the sixth word is attributed to the IP options field. The different fields of the IP header are given as below:

- **Version** refers to the version of the IP protocol in use and keeps track of the version of the protocol to which the datagram belongs to. The current version of IP is 4.
- **Internet Header Length (IHL)** indicates the length of the header field in 32-bit words. The minimum value of the header field is 5 that apply when no option is present. The maximum value of this 4 bit field is 15 that restricts the header to 60 bytes and thus Option field to 40 byte.
- **Type of service** enables the host to indicate the subnet what kind of service (e.g., reliability and speed) it wants. It refers to any of the type of services that IP supports. Desired service type is normally specified by user level applications. Examples of service type include minimum and maximum throughput, requested by applications such as the File Transfer Protocol (FTP) and Simple Mail Transfer Protocol (SMTP).
- **Total length** has everything in the datagram (max. 64 KB). If it is subtracted from the IHL field, it indicates to IP the actual length of the data field.
- **Identification** enables the destination host to determine which datagram a newly arrived fragment belongs to.
- **DF** means Do not Fragment.
- **MF** is for More Fragments.

- **Fragment** offset indicates the source location of the current datagram. The elementary fragment unit size is 8 bytes.
- **Time to live** that counts hops is expressed in seconds. A zero count indicates that the packet is discarded. TTL is employed by IP to prevent a lost datagram from endlessly looping around the network. IP achieves this objective by initializing the TTL field to the maximum number of routers that the packet can traverse on the network. Every time the datagram traverses a router, IP decrements the TTL field by 1.
- **Protocol** indicates the destination which transports process to give the datagram to (TCP, UDP, or others).
- **Header checksum** verifies the header only. The algorithm is to add up all the 16-bit halfwords as they arrive, using one's complement arithmetic.
- **Source/Destination** address tells the network number and host number.
- **Options** provides an escape to allow subsequent versions of the protocol to have information not present in the original design, to allow experimenters to try out new ideas, and to avoid allocating header bits to information that is rarely needed. On its presence, it includes optional control information. An example of optional information includes the route record, which includes a record of every router that the datagram traversed during its trip around the network.

8.5 USE OF INTERNET

The Internet provides numerous uses to managers they use it to glean intelligence about rivals, monitor sale, promote their products and services etc. The advantages of internet are:

1. **Marketing and selling products and services:** The "buy and sell" aspect of Internet commerce has attracted more media attention than any other networked activity to date. Thousands of e-corporations have sold over \$1 millions each in 2000. The highest sales volume was in business-to-business commerce, and it is growing. The next highest sales were to government agencies, followed by colleges and universities. In terms of revenue, business-to-consumer ranks fourth in Internet revenue.
2. **Leveling the playing field:** By advertising the products/services on net, the enterprise is on equal footing with larger company.
3. **Excellent customer support resource and service:** The most common support resource created is FAQs (Frequently Asked Questions). Most web sites create customer feedback in the form of suggestions and complaints.
4. **Doing business fast:** Internet promotes e-selling in fraction of seconds. Thus, it promotes the growth of a customer base.
5. **Obtaining users opinion:** It promotes interactive surveys. The users opinions can be gathered anywhere as it provide real-time statistics to the user.
6. **Promoting of economy and efficiency:** The cost of establishing and maintaining the website is far less than off line trading. From a marketing view, the web site provides user information more quickly, in a more timely fashion, and the convenience of the user.

ARPA to allow NSF-funded supercomputer centers and selected researchers to use the ARPANET. Believing that ARPANET was not suitable, NSF instituted the NSF Connections programme in 1986 to broaden the base of network users with their own computer facilities and eventually to help universities achieve access to supercomputers (by supplying hardware and telecommunications lines for direct, point-to-point connections). In 1986, it launched the NSFNET network backbone programme.

1987: CSNET merged with BITNET, a worldwide network connecting IBM mainframes that was initiated in 1980-81. CSNET operations were continued under the Corporation for Research and Education Networking (CREN), whose operating costs were completely covered by member organizations' dues.

1987: After significant congestion was experienced in 1987, the backbone was upgraded from 56 kbps to T1 service (1.5 Mbps) and became operational in 1988.

1988: The Internet virus is unleashed by a graduate student at Cornell University, focusing attention on network vulnerability to security threats. Immediate steps were taken to make the network more secure.

1990: Twenty years after its birth at UCLA, ARPANET was officially decommissioned; its descendant, the NSFNET, inherited its role as the research and education 1990 communities' backbone network. The first relay between a commercial electronic mail carrier (MCI Mail) and the Internet took place through the Clearinghouse for Networked Information.

Its mission accomplished, CSNET service was discontinued. For the first time, commercial networks were connected to the NSFNET backbone through the Commercial Internet exchange (CIX) Association. CIX was formed by General Atomics (CERFnet), Performance Systems International, Inc. (PSINet), and UUNET Technologies, Inc. (AlterNet).

1991: A new breed of distributed information services called Wide Area Information Servers (WAIS) released by the now-bankrupt Thinking Machines Corporation; Gopher was released by the University of Minnesota, and the World Wide Web was announced on alt.hypertext by Tim Berners-Lee of CERN.

The U.S. government made a decision to turn NSFNET into a faster research network called National Research and Education Network (NREN) as defined in the High-Performance Computing Act of 1991.

1993: National Information Infrastructure announcement sparks interest in the Information Superhighway. Businesses and media suddenly realized there was something called the Internet and began to take an interest in its exploitation.

1994: Two million copies of a freeware Mosaic – a multimedia browser for the WWW, written by Marc Andreessen, at that time an undergraduate student at the University of Illinois at Urbana Campaign – were distributed over the Internet and attained incredible popularity. This milestone event represents a new chapter in electronic commerce.

1995: The old NSFNET backbone is decommissioned and a new architecture based on Network Access Points (NAPs) is installed.

2000: IT Act, 2000 passed by the Government of India.

Check Your Progress

Fill in the blanks:

1. The Internet is an unprecedented to a vast wealth of knowledge and information, and its uses are virtually unlimited.
2. The World Wide Web is one of the services accessible via the
3. A scripting language based on the syntax of Java. JavaScript was created by
4. Web browsers are applications that content in the form of HTML from web servers

8.7 LET US SUM UP

The Internet refers to millions of computers connected to a gigantic network and communicating via TCP/IP protocols. A protocol is a pre-defined way for a computer to communicate with another computer, for instance when requesting a service, an FTP service, or when forwarding some information to another machine. Each computer at any given time has a unique address on the Internet. This is its IP address. A web search engine is an interactive tool to help people locate information available via the World Wide Web. Web search engines are actually databases that contain references to thousands of resources. There are many search engines available on the web. A web search engine provides an interface between the user and the underlying database. Internet browsing or net surfing is the process of visiting the different web sites on the Internet hosted by the various companies, organisations, educational institutions, magazines and individuals. These are many services and tools which are out there and some have been for much longer like Internet mail, File Transfer Protocol (FTP), Telnet, Internet relay chat etc.

8.8 KEYWORDS

Internet: It refers to millions of computers connected to a gigantic network and communicating via TCP/IP protocols.

Protocol: It is a pre-defined way for a computer to communicate with another computer, for instance when requesting a service, an FTP service, or when forwarding some information to another machine.

IP Address: Each computer at any given time has a unique address on the Internet, that is known as IP address.

Web Search Engine: It is an interactive tool to help people locate information available via the World Wide Web.

Internet Browsing: It is the process of visiting the different web sites on the Internet hosted by the various companies, organizations, educational institutions, magazines and individuals.

8.9 QUESTIONS FOR DISCUSSION

1. What is meant by Internet?
2. “The Internet is a medium and a market.” Do you agree? Discuss.

LESSON

9

A PAGE ON THE WEB

CONTENTS

- 9.0 Aims and Objectives
- 9.1 Introduction
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 - 9.2.2 Creation of HTML Web Page
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- 9.5 Keywords
- 9.6 Questions for Discussion
- 9.7 Suggested Readings

9.0 AIMS AND OBJECTIVES

After studying this lesson, you will be able to:

- Explain a page created on web
- Discuss HTML basics
- Describe the client side and server side scripting

9.1 INTRODUCTION

HTML stands for Hyper Text Markup Language. HTML represents a way to take ordinary text and turn it into hypertext by just adding special elements - called markup tags - that tell Web browsers how to display a Web page's contents.

- **Text:** This is content that is modified by a tag. For example, if the tag were a document title, the HTML string `<TITLE> UPTEC Computer Consultancy Ltd </TITLE>` would display the text in the title bar at the top of a graphical browser's window.
- **{</TAG NAME>}**: A closing tag name is denoted by a left angle bracket (<), followed by a forward slash (/), then the tag name, and finally a closing right angle bracket (>); curly braces indicate that this element does not always occur.

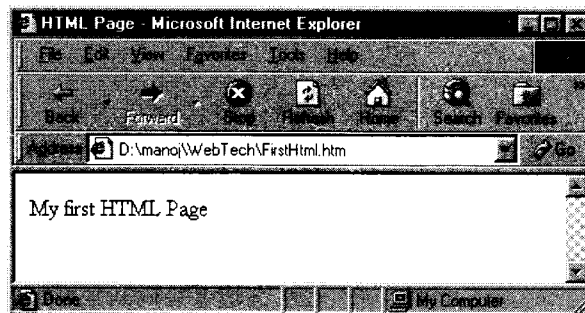
The ampersand (&) is another special HTML control character. It is used to denote a special character for HTML content that may not belong to a 7-bit ASCII character set. Such tagged items are called character entities. Some HTML elements have no content. For example, the horizontal rule element (which uses the `<HR>` start tag) has no content; its only role is to create a line. Elements with no content are called "empty elements", and they never have end tags.

First HTML Example

To create this HTML example, just start your text editor and type in the following HTML code and save it as `first.html.htm`.

```
<HTML>
<HEAD>
<TITLE> HTML page </TITLE>
</HEAD>
<BODY>
My first HTML page
</BODY>
</HTML>
```

Load this page in a browser. It will display this code as a simple web page.



9.2.3 Basic Structure of an HTML Document

Well structured HTML documents come in these three parts:

1. A head that identifies a document as HTML and establishes its title.
2. A body that contains the content for a Web page. This part holds all displayed text on a page, as well as most links to graphics, multimedia, locations inside the same file, and to other Web documents.
3. A footer that labels a page by identifying its author, date of creation, and version number.

Defining HTML Documents with the HTML Element

One should bracket an entire HTML document by the identification tags `<HTML>`, to open the document, and `</HTML>`, to close it. These tags identify the DTD for the document to an SGML sensitive program, to allow the program to interpret a document's contents properly. An optional line may sometimes precede a document head. It is called a document type prolog and describes, in SGML, that the HTML document complies to the indicated level of the HTML DTD.

e.g.: `<!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 3.2// EN" >`

It indicates that the HTML document confirms to the HTML 3.2 DTD distributed by the Internet Engineering Task Force (IETF). You can also tell that the DTD is PUBLIC and is not system dependent. Finally, you can tell that the HTML tag set is defined by the English language (the EN in the DOCTYPE statement).

Describing Documents with the Head Element

The head element is used to mark the position of the head section. The head section contains elements that define certain information about an HTML document, such as what its title is, who the author is, and reference information about the document. To create a head element, start with `<HEAD>` tag, then include all of the elements you want in your head section, then end the head element with a `</HEAD>` tag.

Naming Documents with the Title Element

Titles are displayed by browsers on the top of the page, usually in the title bar. Every HTML document must have a title contained in a `<TITLE>` start tag and a `</TITLE>` end tag. For example:

```
<HEAD >
<TITLE > HTML page </TITLE >
</HEAD >
```

Wrapping your Content with the Body Element

The real content for any HTML document occurs in the body section, which is enclosed between `<BODY>` and `</BODY>` tags.

Two Categories of Body Elements

There are two basic categories of HTML elements used in the body section:

- **Block-level Elements:** Block-level elements are used to define groups of text for a specific role. They include tags that position text on the page, begin new paragraphs, set heading levels and create lists. Some commonly used block-level elements and their tags are:

Paragraph: `<P>` and `</P>`

Heading, level one: `<H1>` and `</H1>`

Heading, level two: `<H2>` and `</H2>`

Horizontal rule: `<HR>`

Centring: `<CENTER>`

Strikethrough text is difficult to read onscreen, so use this tag sparingly. Use `<STRIKE>` to show text removed from earlier versions of a document, the old text will appear with a line through it.

e.g.: `<STRIKE> My web page </STRIKE>`

Tag: `<BIG> ... </BIG>`

Tag Name: Big text

It makes text font one size larger than the `<BASEFONT>` size.

Nesting `<BIG>` tags can produce text in a larger font than using only one `<BIG>` tag.

e.g.: `<BIG> My Heading</BIG>`

`<BIG> <BIG> The Header</BIG> </BIG>`

Tag: `<SMALL> ... </SMALL>`

Tag Name: Small text

This element makes text one size smaller than the basefont size.

Nesting `<SMALL>` tags can produce text in a smaller font than using only one `<SMALL>` tag.

e.g.: `<SMALL> My normal text</SMALL>`

Tag: `<TT> ... </TT>`

Tag Name: Teletype text

The Teletype element renders the enclosed text in teletype font. This means that the text will be monospaced to look like a typewriter font (browsers will often use Courier font by default).

9.2.5 Usability

Adding Pictures

To add a picture, use the `` (image) tag, entering the tag at the place in the BODY section of the Web page where you want the graphic to appear. You use the SRC (source) attribute to specify the name of the file that contains the picture that you want to be displayed on the Web page, like this:

```
<IMG SRC="picture.gif" >
```

Before you add a picture to your page, you need to determine where the picture will be stored. The filename is either an absolute pathname or a relative pathname.

Absolute vs. Relative Pathnames

An absolute pathname includes the full pathname of the file. This means that if you move your files or if you change your directory (folder) names, you have to edit every `` tag in every HTML file that contains the absolute pathname. For that reason, this naming convention is not recommended.

A relative pathname indicates the pathname of the image file relative to the pathname of the HTML file. This is the recommended naming convention for graphics files. For example, if your image file is stored in the same directory as your HTML file, you can use just the image filename in your `` tag, with no pathname, as in the example in the previous section. If the image file is in the same

directory as your HTML file, but in a subdirectory, include the subdirectory name in the tag, like this:

```
<IMG SRC="images / picture.gif" >
```

If the image file is stored one directory level up from your HTML file, use two dots (..) in the pathname to move up a directory level, as follows:

```
<IMG SRC="../picture.gif" >
```

Some Web authors like to store their frequently used graphics in a directory called images or pix, so that all the tags in all the pages in the rest of the directories of the Web site can refer to one set of graphics files.

Image Attributes

You can add the following attributes to the tag to adjust the picture and control how text flows around the picture:

HEIGHT and **WIDTH** control the size (in pixels) at which the graphic appears on the Web page. These attributes are options; use them only if you do not like the default size and need to resize the picture. The Web browser that displays the Web page adjusts the height and width of the graph to the sizes that you specify. When you use the HEIGHT and WIDTH attributes, make sure that you keep the same proportions as the original graphic; if you do not, the picture looks like you s-t-r-e-t-c-h-e-d it - either horizontally or vertically. Resizing a graphic to be larger than the original is rare. The larger the number of pixels, the bigger the picture. For example, the following tag displays the picture in the file picture.gif as 30 by 50 pixels, regardless of the size of the stored picture:

```
<IMG SRC="picture.gif" HEIGHT="30" WIDTH="50" >
```

Using small (but legible) graphics on Web pages is best, because they land faster than large graphics. To make a graphic small, be sure to use a graphics program to reduce the size of the file. Do not just change HEIGHT and WIDTH attributes, which do not change the file size (or speed up downloading time), only the way it is displayed by the browser.

ALIGN controls how text flows around the graphic. Align has five possible values:

TOP places one line of text even with the top of the image.

MIDDLE places one line of text at the middle of the image.

BOTTOM places one line of text even with the bottom of image. Top, Middle, and Bottom are useful when you have a single line of text that you want placed next to a graphic.

LEFT places the graphic on the left side of the page, with your text paragraph wrapped around the left side of the graphic. LEFT and RIGHT are useful when you have paragraphs of text that you want to wrap around a graphic. For example, the following tag displays a picture on the left side of the Web page, with the surrounding text wrapped around its right side:

```
<IMG SRC="picture.gif" ALIGN="LEFT" >
```

HSPACE and **VSPACE** control the amount of white space around the image. Both values are indicated in pixels. HSPACE sets the amount of space at the left and right of the image; you use this attribute to control the distance between the text that is wrapped around your graphic and the graphic

itself. VSPACE sets the amount of space above and below the graphic. The following tag inserts a picture with 25 blank pixels to either side, and 10 blank pixels above and below the picture:

```
<IMG SRC="picture.gif" HSPACE="25" VSPACE="10" >
```

Displaying Wallpaper in the Background

The background of your page can be either an image or a specific colour. To set an image as the background of your page, use the BACKGROUND attribute and place the name of your image file within quotes:

```
<BODY BACKGROUND="image.gif" >
```

Like tags, attribute names can appear in upper or lowercase. For the filename, be sure to use the same capitalization that is used in the actual filename. When a browser displays the page, the image in the file that you specify is tiled to fill the background of the Web page, that is, it is repeated across and down the page.

Choosing a Background Colour

Instead of using wallpaper, you can specify a solid background colour for your Web page. Use the BGCOLOR attribute in the <BODY> tag. For the colour, you can enter either a hexadecimal value that represents the colour, or one of 16 standard colour names. The colour names are the following: aqua, black, blue, fuchsia, gray, green, lime, maroon, navy, olive, purple, red, silver, teal, white, and yellow. To indicate a standard colour, use this tag:

```
<BODY BGCOLOR="BLUE" >
```

Using a hexadecimal value is safer, if you want your colours to be read by a wide variety of browsers. The hexadecimal value is six characters that represent the amount of red, green, and blue in the colour. The first two characters indicate the amount of red, the next two characters the amount of green, and the final two characters the amount of blue. For example, this code specifies light aqua:

```
<BODY BGCOLOR="#99FFFF" >
```

9.2.6 Linking Web Pages and Publishing

Internal links behave identical to external links with one exception - you can use relative URLs for internal links. A relative URL simply drops the common part from the URL and lets the browsers automatically figure out the part that is missing. For example, instead of specifying MyPage just specify the part that's different from the current page's URL:

```
<A HREF="history.htm"> My Page </A>
```

Tag: <BASE> ... </BASE>

Tag Name: Relative Addressing base

It occurs within <HEAD> ... </HEAD> and establishes the URL basis for subsequent URL references in <LINK> or anchor statements in the document body.

Attributes:

- HREF = "URL"
- States the absolute or relative URL for the current document.
- TARGET = "window"

There are four pre-defined names that can be targeted by an anchor. They all start with an underscore (_).

```
<A HREF = "document.htm" Target = "_blank" > My document </A >
```

Clicking on My document would cause a new browser window to appear, containing the document.htm file.

For example:

```
<A HREF = "document.htm" Target = "_parent" > My document </A >
```

Clicking on My document would cause the document.htm file to appear in the parent frameset.

```
<A HREF = "document.htm" Target = "_top" > My document </A >
```

Clicking on My document would cancel all of the frames and replace the entire frameset with the document.htm file.

Tag: <Link > ... </Link >

Tag Name: Link

The link element indicates relationships between your documents and other documents or URLs.

Attributes:

- HREF = "URL"
- MEDIA = SCREEN|PRINT|PROJECTION|BRAILLE|SPEECH|ALL
- REL = "text"

The address of the current link destination, accessible through normal web linkage mechanisms.

Identifies the ideal environment for the web page to be conveyed in. The default is ALL.

It indicates a normal relationship to the document specified in the URL.

e.g.: <LINK REL = "INDEX" HREF = "index.htm" >

This tag would let browsers know where they can find the main index for your Web site.

- REV = "text"

It indicates a reverse relationship. The referenced document has the indicated relationship to the current document.

e.g.: <LINK REV = "Index" HREF = "history.htm" >

This tag would let browsers know that there is a two-way relationship between history.htm and index.htm - that index.htm is the index of history.htm, and simultaneously, history.htm is indexed by index.htm.

- Target = "window"
Specifies loading the link into the targeted window.
- Type = "text"
Specifies the Internet media type of linked resource. For example, the type for CSSI sheets is "TEXT/CSS".

9.2.7 Publishing Documents

Publishing means putting HTML documents on a Web server and telling people where to look for them. The exact process you will use for publishing documents depends on your situation. Some large organizations have well-defined publishing procedures; in such cases, you might simply fill out HTML forms and save your files in a specified folder. If your organization does not have procedures or if you are publishing on the Internet, you will need to upload your files, i.e., to copy files from your computer to a server.

Deciding where to store your pages is one of the final steps in creating your Web site plan. To make your site available to everyone on the Web, you need to publish the site on a Web server. You can either set up your own server or post your files to some one else's Web server.

Maintaining your own Server

Setting your own Web server is a very expensive option for publishing your site. It requires the following items:

- A computer capable of handling Web traffic, that is up and running 24 hours a day.
- Web server software.
- A dedicated high-speed phone line (such as an ISDN or T1 line).
- An ISP that will set you up with a dedicated connection to the Internet.

Using your ISP's Server

Most ISPs include a few megabytes of storage space free of charge with a dial-up account, and most offer additional space at reasonable prices. For most people storing Web files on their ISP's server is the most convenient and economical way to publish a site on the Web.

For each ISP, the file transfer procedures are different. Your ISP can give you the instructions that you need to transfer files to its Web server. As soon as the files are transferred, your site is available for viewing on the Web.

Using a Web Hosting Service

A Web hosting service is a company that rents space on their Web servers. Web hosting companies usually offer multiple Web servers, a fast connection to the Internet, domain hosting, frequent backups, unlimited access by the Web server (you) to update your pages, and use of standard CGI scripts, such as scripts that display counters that show how many visitors your page has had. Charges may be fixed, or they may depend on how much space your Web pages occupy and how many visitors you have.

To find a Web hosting service, start at Yahoo! (<http://www.yahoo.com>) and choose Business and Economy/companies/Internet Services/Web services/Hosting.

Publicizing your Site

After your site is published on the Web and you have joined the global online community, how are you going to publicize the site? The first step is to register your site with some search engines, so that people doing online searches can find the site. Apart from advertizing your site by the word of mouth, here are some other ways to let other people know that your site is on the web. Use the method that is appropriate for your site:

- Get the URL of your site printed on your business cards, stationary, and in yellow pages.
- Add your URL to your signature block in e-mail and newsgroup messages.
- Include the URL in your return address whenever you send greeting cards or holiday cards.
- Have some bumper stickers printed showing your group or club's URL.
- Print the URL in your church bulletin each week.
- Post the URL on all school bulletin boards.

9.2.8 Testing Published Documents

Earlier in this lesson, we discussed testing documents on your local computer. Now it's time to test them in the real world, looking for the same issues addressed previously, as well as making sure that all the links work and that all the documents are transferred properly to the server. Additionally, at this stage, your goal is not only to look for layout, formatting, and proof reading errors, but also to get an accurate idea of what visitors will see when they access your pages. In particular, find out how fast pages load, how pages appear at various screen sizes and colour depths, and how different browsers display page elements.

Publishing Tools

Web pages are coded using Hyper Text Markup Language (HTML) tags to specify the way text and graphics are displayed. When you create your own Web pages, you can either type the tags manually in a text editor or use a Web page editor to do the coding for you. These editors are also called Web publishing tools. There are number of Web page editors available for making Web pages. Web page editors are available as stand-alone applications or bundled into the Internet software package. Some popular editors are Netscape Composer (which is part of the Netscape Communicator suite), FrontPage and FrontPage Express (from Microsoft), PageMill (from Adobe), and HotDog Professional (from Sausage Software). All run under Windows 98 and some (including Netscape Composer) are also available for the Mac. This section describes FrontPage, in some detail, as an example of how a Web page editor works. The other editors work in a similar way.

Language Description

The language description of HTML was a document called HTML Tags. It explains 20 elements include the initial, comparatively simple design of HTML. Apart from the hyperlink tag, these were strongly influenced by SGMLguid, an in-house SGML based documentation format at CERN. Thirteen of these elements still exist in HTML.

HTML is a markup language that web browsers use to interpret and create text, images and additional material into visual or audible web pages. Default characteristics for every item of HTML markup are defined in the browser, and these characteristics can be altered or enhanced by the web page designer's additional use of CSS. Many of the text elements are found in the 1988 ISO technical report TR 9537 Techniques for using SGML, which in turn covers the features of early text formatting languages such as that used by the RUNOFF command developed in the early 1960s for the CTSS (Compatible Time-Sharing System) operating system: these formatting commands were derived from the commands used by typesetters to manually format documents. However, the SGML concept of generalized markup is based on elements (nested annotated ranges with attributes) rather than merely print effects, with also the separation of structure and processing; HTML has been progressively moved in this direction with CSS.

It was properly defined as such by the Internet Engineering Task Force (IETF) with the mid-1993 publication of the first proposal for an HTML specification: "Hypertext Markup Language (HTML)" Internet-Draft by Berners-Lee and Dan Connolly, which included an SGML Document Type Definition to define the grammar. The draft expired after six months, but was notable for its acknowledgment of the NCSA Mosaic browser's custom tag for embedding in-line images, reflecting the IETF's philosophy of basing standards on successful prototypes. Similarly, Dave Raggett's competing Internet-Draft, "HTML+ (Hypertext Markup Format)", from late 1993, suggested standardizing already-implemented features like tables and fill-out forms.

After the HTML and HTML+ drafts expired in early 1994, the IETF created an HTML Working Group, which in 1995 completed "HTML 2.0", the first HTML specification intended to be treated as a standard against which future implementations should be based. Published as Request for Comments 1866, HTML 2.0 included ideas from the HTML and HTML+ drafts. The 2.0 designation was intended to distinguish the new edition from previous drafts.

Static Nature

The static nature of HTML permits a screen reader to access the HTML content in a linear fashion. When a visual user accesses a Flash movie, he or she visually scans the contents of the movie and focuses directly on the important content or functionality. A screen reader user cannot "scan" through Flash content and can only access it in a linear manner and in the order the Flash developer has chosen to present it. Flash's timeline and programming language (Action Script) allow constantly changing, dynamic, updating objects to animate, move, disappear, or duplicate themselves whenever the Flash developer chooses (or even randomly if they want). Because Flash content is usually constantly changing, this limits the ability of the screen reader to read the content in a sufficient or timely manner.

The comparatively static nature of HTML as the content language for the Web has meant that any one of these communities have previously held out little hope that their XML document types would be able to see widespread adoption as part of Web standards. The modularization framework allows for the dynamic incorporation of these diverse document types within the XHTML-family of document types, further reducing the barriers to the incorporation of these domain-specific vocabularies in XHTML documents.

In essence DHTML make on the static nature of HTML by allowing authors to specify the exact position and style of elements within a Web page. This contrasts with the previous model whereby individual browsers were tasked with information presentation based on a set of guidelines. In addition the Web page elements can be further manipulated using scripts.

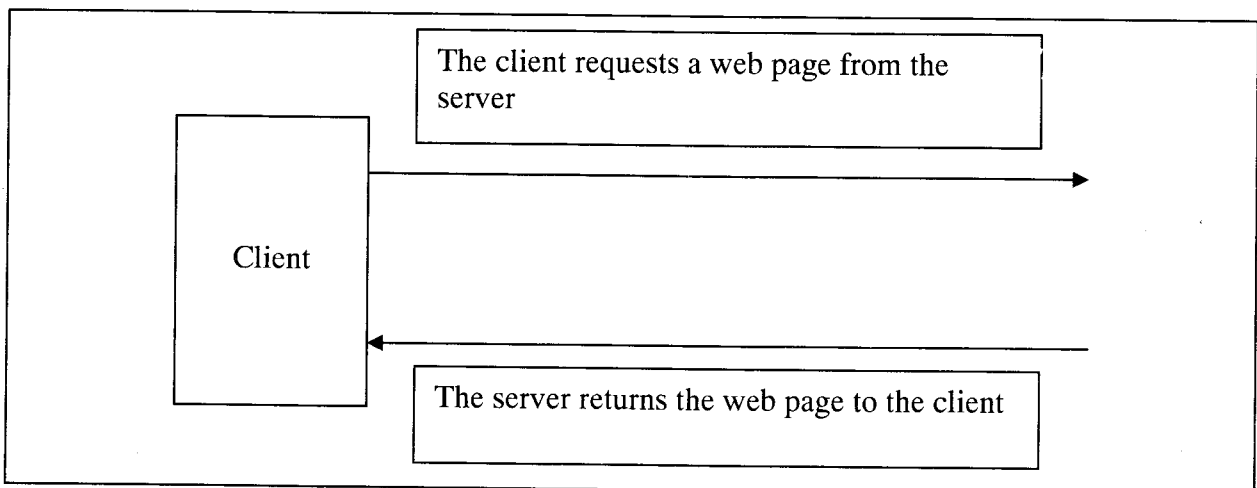
9.3 CLIENT-SIDE AND SERVER-SIDE SCRIPTING

In a client-server model, two computers work together to perform a task. A client computer requests some needed information from a server computer. The server returns this information and the client acts on it. The internet runs on a client-server model. With internet the server is a particular Web server and the client is a Web browser.

A web server is a computer that contains all the web pages for a particular web site and has special software installed to send these web pages to web browsers that request them.

The following steps occur when a web browser visits a static web page:

- The client (web browser) locates the web server specified by the first part of the URL(www.something.com)
- The client then requests the static web page specified by the second part of the URL(/index.htm)
- The web server sends the contents of that particular file to the client in HTML format.
- The client receives the HTML sent by the server and renders it for the user.



When a web browser requests an ASP page, the following steps occur:

- The client locates the web server specified by the first part of the URL(www.something.com)
- The client then requests the ASP page specified by the second part of the URL(/default.asp)
- The web server reads the ASP file and processes the code.
- After the ASP page has been completely processed by the web server, the output is sent in HTML format to the client.
- The client receives the HTML sent by the server and renders it for the user.

How ASP differs from Client-side Scripting Technologies?

Client-side Scripting is programmatic code in an HTML file that runs on the browser. It is denoted by <SCRIPT> HTML tag. It is commonly written using the JavaScript programming language due to

the fact that Netscape Navigator only supports the JavaScript scripting language for Client-side scripting. ASP scripts are server-side scripts.

While using ASP, its code exists on the server only. ASP code, which is surrounded by the `<%` and `%>` delimiters is processed completely on the server. The client cannot access this ASP code.

Differences

A Client-side script is processed only by the client. It is the client's responsibility to execute all Client-side scripts on the other hand; Server-Side scripts are processed completely on the web server. The client does not receive any code from server side scripts rather the client receives just the output of the Server-side scripts.

Client-Side scripts and Server-Side scripts cannot contract with one another because the Client-side scripts are executed on the client, after the service side scripts have finished processing completely.

Check Your Progress

Fill in the blanks:

1. HTML itself is a system of codes made up of tags and that serve to identify parts and characteristics of HTML documents.
2. All tags are composed of that are contained within angle brackets (`<` `>`).
3. Structure tags provide with information about document characteristics.
4. The language description of HTML was a called HTML Tags.

9.4 LET US SUM UP

HTML documents are essentially plain text files. They contains no images no sounds, no video, and no animations; however, they can include "pointers", or links, to these other file types, which is how Web pages end up looking as if they contain non-text elements. Tags are easy to read and use once you become familiar with their components. First, all tags are composed of elements that are contained within angle brackets (`<` `>`). The angle brackets simply tell browsers that the text between them is a HTML command. To add a picture, use the `` (image) tag, entering the tag at the place in the BODY section of the Web page where you want the graphic to appear. Publishing means putting HTML documents on a Web server and telling people where to look for them. The exact process you will use for publishing documents depends on your situation.

9.5 KEYWORDS

HTML: Hyper Text Markup Language

IETF: Internet Engineering Task Force

CTSS: Compatible Time-sharing System

ASP: Active Server Pages

9.6 QUESTIONS FOR DISCUSSION

1. What is HTML document?
2. Write the steps to create a HTML web page for a university.
3. Describe the language description of HTML.
4. Explain the usability of HTML document.
5. Discuss the static nature of HTML.

Check Your Progress: Model Answer
--

- | |
|---|
| <ol style="list-style-type: none">1. attributes2. elements3. browsers4. document |
|---|

9.7 SUGGESTED READINGS

- Kienam, *Managing Your E-Commerce Business*, Prentice Hall of India, New Delhi.
- Kosiur, *Understanding E-commerce*, Prentice Hall of India, New Delhi.
- Kalakota, Whinston, *Frontiers of Electronic Commerce*, Addison Wesley.
- Schneider P. Grey, Perry T. James, *E-Commerce*, Thomson Learning, Bombay.
- Shurety, *E-business with Net Commerce (with CD)*, Addison Wesley.
- Napier, *Creating a winning E-business*, Vikas Publishing House, New Delhi.
- Didar Singh, *E Commerce for Manager*, Vikas Publishing House, New Delhi.
- Whitely David, *Electronic Commerce*, TMH, New Delhi.

LESSON

10

THE ELEMENTS OF E-COMMERCE

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10.0 AIMS AND OBJECTIVES

After studying this lesson, you will be able to:

- Explain the elements of e-commerce
- Discuss the internet commerce security

- Describe the website evaluation model
- Identify and explain the internet bookshop
- Discuss the internet banking
- Explain the concept online share dealing
- Paraphrase the procedure e-diversity
- Discuss the technology adoption

10.1 INTRODUCTION

Electronic commerce is a generic name for a range of technologies that allows the transfer of business information using electronic means. It is popularized by the advent of commercial services of the Internet. The commercial use of internet is perhaps typified by once-off sale to consumers. Companies are re-orienting themselves in the present competitive era. Globalization of markets is taking place with formation of trade blocks across the globe, and world moving towards a global village. Technology is setting the pace for how a company does business, how it launches new products and enters into a new market, how it deals with suppliers, and how it communicates with customers and others in the new marketplace.

10.2 ELEMENTS OF E-COMMERCE

The technologies used to implement the internet commerce are:

1. Convenient storage and retrieval of information about products and customers require a database.
2. A convenient interface to the database from the web site. A customer does not need to know anything even about the existence of the database, not to mention details of its organization. He/she should be able to get all necessary information by typing in keywords and filling in electronic forms.
3. We need to be able to process user's forms, for instance order forms, and produce various web pages, depending on the request.
4. A web site doesn't "know" from where the requests of web page have come, so it keeps track of a user during a session (and sometimes between sessions), through cookies.
5. A common way by which secure communications are implemented is via SSL (Secure Sockets Layer), which allows various forms of encryption, depending on the maximum level of encryption provided by the server and the client and on geographic location of the machines.
6. Electronic Payment Systems are based on customer's accounts with one of trusted vendors. A customer obtains certificates "signed" by the vendor which are analogous to cheques ("personal money") and cash ("anonymous money").

10.3 INTERNET E-COMMERCE SECURITY

Information security is provided on computers and over the Internet by a variety of methods. A simple but straightforward security method is to only keep sensitive information on removable storage

media like floppy disks. But the most popular forms of security all rely on encryption, the process of encoding information in such a way that only the person (or computer) with the key can decode it.

10.3.1 Computer Encryption

Encryption is the transformation of data into a form that is as close to impossible as possible to read without the appropriate knowledge. Its purpose is to ensure privacy by keeping information hidden from anyone for whom it is not intended, even those who have access to the encrypted data. Decryption is the reverse of encryption; it is the transformation of encrypted data back into an intelligible form.

Encryption and decryption generally require the use of some secret information, referred to as a key. For some encryption mechanisms, the same key is used for both encryption and decryption; for other mechanisms, the keys used for encryption and decryption are different.

Today's cryptography is more than encryption and decryption. Authentication is as fundamentally a part of our lives as privacy. We use authentication throughout our everyday lives – when we sign our name to some document for instance – and, as we move to a world where our decisions and agreements are communicated electronically, we need to have electronic techniques for providing authentication.

Cryptography provides mechanisms for such procedures. A digital signature binds a document to the possessor of a particular key, while a digital timestamp binds a document to its creation at a particular time. These cryptographic mechanisms can be used to control access to a shared disk drive, a high security installation, or a pay-per-view TV channel.

The field of cryptography encompasses other uses as well. With just a few basic cryptographic tools, it is possible to build elaborate schemes and protocols that allow us to pay using electronic money, to prove we know certain information without revealing the information itself and to share a secret quantity in such a way that a subset of the shares can reconstruct the secret.

While modern cryptography is growing increasingly diverse, cryptography is fundamentally based on problems that are difficult to solve. A problem may be difficult because its solution requires some secret knowledge, such as decrypting an encrypted message or signing some digital document. The problem may also be hard because it is intrinsically difficult to complete, such as finding a message that produces a given hash value.

Computer encryption is based on the science of cryptography, which has been used throughout history. Before the digital age, the biggest users of cryptography were governments, particularly for military purposes. The existence of coded messages has been verified as far back as the Roman Empire. But most forms of cryptography in use these days rely on computers, simply because a human-based code is too easy for a computer to crack.

Most computer encryption systems belong in one of two categories. Broadly speaking, there are two types of encryption methods:

- Secret-key cryptography
- Public-key cryptography

10.3.2 Firewall

If you have been using the Internet for any length of time, and especially if you work at a larger company and browse the Web while you are at work, you have probably heard the term firewall used. For example, you often hear people in companies say things like, "I can't use that site because they won't let it through the firewall."

If you have a fast Internet connection into your home (either a DSL connection or a cable modem), you may have found yourself hearing about firewalls for your home network as well. It turns out that a small home network has many of the same security issues that a large corporate network does. You can use a firewall to protect your home network and family from offensive Web sites and potential hackers.

Basically, a firewall is a barrier to keep destructive forces away from your property. In fact, that's why it's called a firewall. Its job is similar to a physical firewall that keeps a fire from spreading from one area to the next. As you read through this article, you will learn more about firewalls, how they work and what kinds of threats they can protect you from.

A firewall is simply a programme or hardware device that filters the information coming through the Internet connection into your private network or computer system. If an incoming packet of information is flagged by the filters, it is not allowed through. Let's say that you work at a company with 500 employees. The company will therefore have hundreds of computers that all have network cards connecting them together.

In addition, the company will have one or more connections to the Internet through something like T1 or T3 lines. Without a firewall in place, all of those hundreds of computers are directly accessible to anyone on the Internet. A person who knows what he or she is doing can probe those computers, try to make FTP connections to them, try to make telnet connections to them and so on. If one employee makes a mistake and leaves a security hole, hackers can get to the machine and exploit the hole.

With a firewall in place, the landscape is much different. A company will place a firewall at every connection to the Internet (for example, at every T1 line coming into the company). The firewall can implement security rules. For example, one of the security rules inside the company might be:

Out of the 500 computers inside this company, only one of them is permitted to receive public FTP traffic. Allow FTP connections only to that one computer and prevent them on all others. A company can set up rules like this for FTP servers, Web servers, Telnet servers and so on. In addition, the company can control how employees connect to Web sites, whether files are allowed to leave the company over the network and so on. A firewall gives a company tremendous control over how people use the network.

Firewalls use one or more of three methods to control traffic flowing in and out of the network:

- **Packet filtering:** Packets (small chunks of data) are analyzed against a set of filters. Packets that make it through the filters are sent to the requesting system and all others are discarded.
- **Proxy service:** Information from the Internet is retrieved by the firewall and then sent to the requesting system and vice versa.
- **Stateful inspection:** A newer method that doesn't examine the contents of each packet but instead compares certain key parts of the packet to a database of trusted information.

Information traveling from inside the firewall to the outside is monitored for specific defining characteristics, then incoming information is compared to these characteristics. If the comparison yields a reasonable match, the information is allowed through.

Otherwise it is discarded what it protects you from there are many creative ways that unscrupulous people use to access or abuse unprotected computers:

- **Remote login:** When someone is able to connect to your computer and control it in some form. This can range from being able to view or access your files to actually running programmes on your computer.
- **Application backdoors:** Some programmes have special features that allow for remote access. Others contain bugs that provide a backdoor, or hidden access that provides some level of control of the programme.
- **SMTP session hijacking:** SMTP is the most common method of sending e-mail over the Internet. By gaining access to a list of e-mail addresses, a person can send unsolicited junk e-mail (spam) to thousands of users. This is done quite often by redirecting the e-mail through the SMTP server of an unsuspecting host, making the actual sender of the spam difficult to trace.
- **Operating system bugs:** Like applications, some operating systems have backdoors. Others provide remote access with insufficient security controls or have bugs that an experienced hacker can take advantage of.
- **Denial of service:** You have probably heard this phrase used in news reports on the attacks on major Web sites. This type of attack is nearly impossible to counter. What happens is that the hacker sends a request to the server to connect to it. When the server responds with an acknowledgement and tries to establish a session, it cannot find the system that made the request. By inundating a server with these unanswerable session requests, a hacker causes the server to slow to a crawl or eventually crash.
- **E-mail bombs:** An e-mail bomb is usually a personal attack. Someone sends you the same e-mail hundreds or thousands of times until your e-mail system cannot accept any more messages.
- **Macros:** To simplify complicated procedures, many applications allow you to create a script of commands that the application can run. This script is known as a macro. Hackers have taken advantage of this to create their own macros that, depending on the application, can destroy your data or crash your computer.
- **Viruses:** Probably the most well-known threat is computer viruses. A virus is a small programme that can copy itself to other computers. This way it can spread quickly from one system to the next. Viruses range from harmless messages to erasing all of your data.
- **Spam:** Typically harmless but always annoying, spam is the electronic equivalent of junk mail. Spam can be dangerous though. Quite often it contains links to Web sites. Be careful of clicking on these because you may accidentally accept a cookie that provides a backdoor to your computer.
- **Redirect bombs:** Hackers can use ICMP to change (redirect) the path information takes by sending it to a different router. This is one of the ways that a denial of service attack is set up.
- **Source routing:** In most cases, the path a packet travels over the Internet (or any other network) is determined by the routers along that path. But the source providing the packet can arbitrarily specify the route that the packet should travel. Hackers sometimes take advantage of this to make information appear to come from a trusted source or even from inside the network! Most firewall products disable source routing by default.

Some of the items in the list above are hard, if not impossible, to filter using a firewall. While some firewalls offer virus protection, it is worth the investment to install anti-virus software on each computer. And, even though it is annoying, some spam is going to get through your firewall as long as you accept e-mail.

The level of security you establish will determine how many of these threats can be stopped by your firewall. The highest level of security would be to simply block everything. Obviously that defeats the purpose of having an Internet connection. But a common rule of thumb is to block everything, then begin to select what types of traffic you will allow.

You can also restrict traffic that travels through the firewall so that only certain types of information, such as e-mail, can get through. This is a good rule for businesses that have an experienced network administrator that understands what the needs are and knows exactly what traffic to allow through. For most of us, it is probably better to work with the defaults provided by the firewall developer unless there is a specific reason to change it. One of the best things about a firewall from a security standpoint is that it stops anyone on the outside from logging onto a computer in your private network.

While this is a big deal for businesses, most home networks will probably not be threatened in this manner. Still, putting a firewall in place provides some peace of mind.

10.3.3 Application Gateway

An application gateway is an application programme that runs on a firewall system between two networks. It is also known as application proxy or application-level proxy. When a client programme establishes a connection to a destination service, it connects to an application gateway, or proxy. The client then negotiates with the proxy server in order to communicate with the destination service. In effect, the proxy establishes the connection with the destination behind the firewall and acts on behalf of the client, hiding and protecting individual computers on the network behind the firewall. This creates two connections: one between the client and the proxy server and one between the proxy server and the destination. Once connected, the proxy makes all packet-forwarding decisions. Since all communication is conducted through the proxy server, computers behind the firewall are protected.

While this is considered a highly secure method of firewall protection, application gateways require great memory and processor resources compared to other firewall technologies, such as stateful inspection.

10.3.4 Antivirus Software

Antivirus software are computer programmes that attempt to identify, neutralize or eliminate malicious software. Antivirus is so named because the earliest examples were designed exclusively to combat computer viruses; however most modern antivirus software is now designed to combat a wide range of threats, including worms, phishing attacks, rootkits, trojan horses and other malware. Antivirus software typically uses two different techniques to accomplish this:

- Examining (scanning) files to look for known viruses matching definitions in a virus dictionary.
- Identifying suspicious behavior from any computer programme which might indicate infection. This technique is called heuristic analysis. Such analysis may include data captures, port monitoring and other methods.

Most commercial antivirus software uses both of these approaches, with an emphasis on the virus dictionary approach.

10.3.5 Regular Backups

Each computer user has their responsibility to make regular backups to protect their computer data. The task of backing up the data found on your computer is often the most overlooked and “hardly ever done until its too late” action within the computer end-user community. With the software tools now available, it no longer is the arduous task that is once was a few years ago.

Once your system is in use, your next consideration should be to back up the file systems, directories, and files. Files and directories represent a significant investment of time and effort. At the same time, all computer files are potentially easy to change or erase, either intentionally or by accident. If you take a careful and methodical approach to backing up your file systems, you should always be able to restore recent versions of files or file systems with little difficulty.

When a hard disk crashes, the information contained on that disk is destroyed. The only way to recover the destroyed data is to retrieve the information from your backup copy.

There are several different methods of backing up. The most frequently used method is a regular backup, which is a copy of a file system, directory, or file that is kept for file transfer or in case the original data is unintentionally changed or destroyed. Another form of backing up is the archive backup; this method is used for a copy of one or more files, or an entire database that is saved for future reference, historical purposes, or for recovery if the original data is damaged or lost. Usually an archive is used when that specific data is removed from the system.

10.4 A WEBSITE EVALUATION MODEL

People put lot of pages on their first website, which may have many pages and it is very common mistake people do of dumping all the web pages into a single directory. It is learned quickly that one need to organize the site both logically and with multiple directories, one for each section. Here's a typical small-site structure:

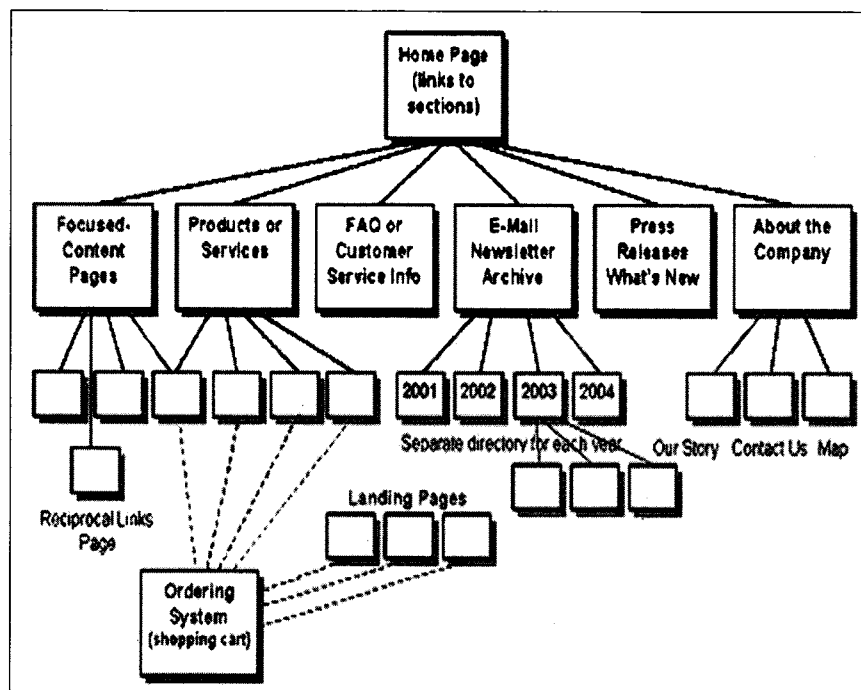


Figure 10.1: Structure of a Website

However, this site layout is only suggestive and not prescriptive. Get a blank piece of paper and begin to lay out what the website should look like, with similar functions grouped together. Don't be afraid to create multiple subdirectories to keep your site organized. When you're setting up newsletter archives, for example, create a directory for each year of issues so a single directory doesn't get too

cluttered. Remember, you're not designing for just the present moment, but for the growth your site may undergo over the next two or three years.

Home page should provide a statement of exactly what your company or organization does. Preparing a Unique Selling Proposition (USP) for your company is a great way to begin. You may be amazed at how many websites don't really tell us what they really do. We have to nose around trying to figure it out. That's stupid! State precisely what you do, and then provide links to the rest of your site so your visitor can learn more.

The site structure diagram should include product pages, landing pages, and an ordering system. The focused content and reciprocal linking pages must be designed to boost your search engine ranking.

In the section "About the Company" be sure to tell your organization's story. Big companies spend millions to build confidence through brand name familiarity. Small businesses tell their story, often illustrated with photos, to help visitors understand and trust them. If you have a passion about what you do, tell your visitors about it in this section! Here's where a local business or organization will include a map and driving directions to help people find them.

After laying out the design of the website, you can see how important a good navigation system is. One of the chief complaints that visitors have is that they can't find the content they're looking for. The larger your site, the more important redundant navigation systems are - more systems than you think you might need. Here are some of the basic systems and a few you might not have thought of:

Left-side menu lists the various sections of your site, and perhaps some of the subsections, too.

Tabs near the top of the webpage help the visitor quickly see the most important sections of your site. This facilitates browsing.

Search the site or the product database. Larger sites need a search feature so visitors don't get lost.

10 most common gifts, etc.

View today's specials or recent news releases.

Bottom links provide hypertext links to all the sectional pages.

Site map shows the structure and has links to every page (or sectional page).

Except for the very smallest five- or six-page sites, we encourage you to implement two or more of these systems. Over-kill, that's the ticket. What may be obvious to you and your designer after looking at the site for weeks may not be obvious at all to your visitor. Each separate navigation system gives her another opportunity to find what she's looking for. If you're a do-it-yourselfer, consider using a free search engine for your search function.

It is essential to mention that certain websites are "button happy." They have graphic buttons down the left side of the page and across the top. They may look nice, but there's a big cost in download time. There's a strong trend on high traffic sites toward text menus made with HTML characters, not GIF images. Look at a text menu you admire and study the HTML by viewing the source. Text is good; buttons are bad - especially when overdone. Got it?

Finally, we would like to say a word about "frames," a kind of HTML menu that lists page names in a window on the left side that scrolls up and down independently of the content window on the right.

Website designers used to love them, until they discovered that they cripple a website's marketing potential. Insist that your site developer not use frames! Instead of using frames, set up your navigation system with Server Side Includes (SSIs).

If you have a complex site, we recommend that you employ a professional website designer to set up your navigation system - even if you do all the rest. Leverage professional experience to help your customers find what they're looking for.

Recognizing Effective Web Design

Every business site and many organization sites want Most Wanted Response (MWR). Your Most Wanted Response is probably one of the chief purposes you listed under Point 1 (above). For many business sites, the purpose is

1. To sell a product,
2. To have the visitor go through an affiliate link to buy a product on another site, or
3. To generate contact information for a future lead or follow-up.

For organizations, success may be measured in memberships or subscriptions. Whatever your MWR, you must work to optimize responses.

Good sales pages result in a high ratio of visitors to sales - called the "conversion rate." A typical site might have a conversion rate of 3% to 5%, some higher and many lower. Over the past few years, marketers have developed the art of increasing the conversion rate. This is especially important when you are purchasing Pay Per Click (PPC) ads to drive traffic to your site. Your profit is closely related to (a) the cost of the click and (b) the conversion rate of the "landing page," that is, the sales page to which you direct interested shoppers.

To scientifically and systematically increase your conversion rate to the maximum, you must carefully track sales percentages for each product you sell. Then make incremental changes to the landing page or the order system and see if the conversion rate rises or falls. Over a period of careful study and change, you'll maximize your sales.

When we use our computers to surf around and open a fully fledged web development tool, we are likely to get drawn to developing something that is cool, technically challenging, new and colourful. The big danger in that is, that we forget the usefulness, the scalability or, very often, even the purpose of the product.

Usability and the utility, not the visual design, determine the success or failure of a website. Since the visitor of the page is the only person who clicks the mouse and therefore decides everything, user-centric design has become a standard approach for successful and profit-oriented web design. After all, if users can't use a feature, it might as well not exist.

Some useful points for effective web design are stated below:

- ***Time to Load:*** 15 Seconds per 1 page. If your webpage is loaded more than that, it's too slow. Your visitors may change to see other websites because they don't like to wait. For those who use Dreamweaver can use a tool to checking for loading time.
- ***Match you product:*** Design the web according to the product or service you want to sale. For example, If you are selling Mobile phone, design your website in modern style.
- ***Lay out:*** Think about your lay out that must be suitable for your content in website. You may use the table. Tables load very fast because it is HTML code. You can use it every where you like, menu, home page etc.
- ***Images:*** Images can make your site look good, but it must suite for your content. Also, keep in mind that they take a long time to load, so use a few images or thumbnail images per page that link to the bigger ones.

- **Information or Content:** Make sure that your information is clear and easy to understand. Split things up into paragraphs or sections. Don't make your page too long and avoid lots of text. If your content is very long, split into 2 or 3 pages. Note that people don't read but they skim it.
- **Link:** Organize your links to be easy for understanding. Try to have a menu to go to other parts of your website in every pages. Don't make your visitors click on Back Button. Also, it's look good, if you have a link to the top of page like "Go to Top". Also, avoid the broken link.
- **Colour of Backgrounds and Text:** A good background is not only a white page but also other colour. Be careful to choose a background and text colour that is not overpowering to the eyes. Text size and font should be readable.
- **Search engine friendly:** Constructing the web pages with an eye to search engines is very important.
- **Community:** People will like your website if there is something to do on your website. Add something like vote, forum or guest book etc.
- **Keep it simple:** You don't have to use advance technology to your website. Most of people find free in formation, so you just make your site easy to understand and dynamic content. Also, use simple language in you website.
- **Site Map:** Don't leave them. Site Map may help your visitors to find pages, when they get lose and it also good for search engine.
- **Contact Us:** As for Contact Us page, it's made when people want to contact you for any suggestion, especially you will get visitors' e-mail for e-mail marketing.

10.5 INTERNET BOOKSHOP

Will the system be used, if it is implemented? Will there be confrontation from users? This is necessary because "equipments do not cry but people do cry". The existing personnel normally worry about job security, loss of per group, changes in job context and so on whenever new systems are proposed. If their voices are not heard at this stage, the problem will be magnified at the implementation stage and appear as direct or indirect resistance to new system.

System Analysis

It is a detailed study of the various operations execute by a system and their relationships within and outside of the system. A key question is: What must be done to solve a problem? During analysis, data are collected on the available files, decision points and transactions handled by the present system. Data flow diagrams, interviews, on site observations, questionnaires are system models and tools that are used in Analysis. Training experience and common sense are required for the collection of the information needed to do the analysis.

System Design

The term design refers to the technical specification that will be applied and implementing the candidate system. It also includes the construction of programmes and programme testing. The first step is to determine how to output is to be produced and in what format samples of output are also presented.

Second input data and master files have to be designed to meet the necessities of the proposed output. The operational phases are handled through programme construction and testing, including the list of programmes needed to meet the system objective and complete documentation. Finally details related

to explanation and estimate of the impact of the candidate system of the user and organization are documented and evaluated by management as a step towards implementation.

Implementation

It is main concern with the user training, site preparation and file conversion. During the final testing user acceptance is tested, followed by User training. Depending on the nature of the system, wide user training may be required. System testing checks the readiness and accuracy of the system to access, update and review from new files. Once the programmes become available, test data are read into the computer and processed against the files provided for testing. If successful, the programmes are then run with live data. Otherwise, a diagnostic procedure is user to locate and correct errors in the programme.

Post-implementation and Maintenance

After the installation phase is concluded and user staff is adjusted to the changes created by the candidate system, evaluation and maintenance begin. The significance of maintenance is to continue to bring the new system to standard. Like any other systems, there is an aging process that requires periodic maintenance of hardware and software. If the new information is inconsistent with the design specifications, then changes have to be made. Hardware also requires periodic maintenance to continue to bring the new system to standards. User priorities, changes in organizational requirements, or environmental factors also call for system enhancements.

10.6 INTERNET BANKING

Electronically-based payment systems have been in operation since the 1960s and have been expanding rapidly as well as growing in complexity. However, in most of the major industrialised countries, an inverse relationship exists between the volume and the number of transactions handled electronically. Typically, of business payments around 85-90% or more of monetary value will be processed electronically, while less than 5-10% of the total number of payment transactions will be handled in this way.

This has been due to four related factors:

1. Proprietary closed networks were developed by banks to handle large and increasingly internationally based payments systems;
2. Large value payments are increasingly associated with foreign exchange and global securities transactions, thereby becoming divorced from underlying world trade;
3. Large value payment systems were not designed nor are they cost-effective for small value payments;
3. Paper-based non-automated payment systems remain an established part of accepted business practice for varying institutional reasons, thereby remaining ingrained in the economic system.

The Internet is experiencing rapid growth which is being largely driven by new commercial users of the network. Other commercial online services provided by companies such as CompuServe, America Online and Prodigy are also expanding rapidly. The Internet and other global online networks are creating new commercial opportunities for networked commerce. However, to date development has been limited by the lack of a payment infrastructure. In the past few years, a number of initiatives have been made public for developing secure payment systems on the Internet.

The creation of an Internet electronic payment system will provide opportunities for the creation of completely new sets of global and national trading relationships. The Internet offers the possibility of

an 'open systems' payment and settlement system which operates in parallel to existing, more traditional bank-based networks, and which is particularly suited to meet the currently unsatisfied requirements for processing low value payments electronically. However, the institutional framework to exploit these opportunities does not yet exist. Regulatory and policy issues will need to be addressed in order that full advantage can be taken of the new types of commerce which could emerge.

10.6.1 National Systems of Exchange

The development of money has been inextricably associated with the growth of trade and commerce. In Europe in the 1100s, rudimentary banking and foreign exchange institutions emerged as a direct product of the medieval trade fairs. Monetary exchange and banking systems then developed rapidly as foreign and domestic trade expanded exponentially following the onset of the industrial revolution. Although commodity-based money dates back to antiquity, money in its present primarily token form (i.e., money that does not exist in any physical form but takes the form of financial claims on banks and other financial institutions) has only assumed predominance during the past 100 years.

Money and monetary systems have also been strongly linked to the role of the state. In the medieval period, money largely meant gold or silver coins whose weight and fitness were guaranteed by the ruler under whose authority they were issued. For a long period of history, official mints were established which would convert bullion into an equivalent weight of coins, minus a fee. In the 20th Century, issuance of currency has been jealously guarded by the nation state and economic policy increasingly has been exercised indirectly through the monetary system using interest rates. However, over the past 40 years, growth in international trade, which has exceeded the expansion of GDP at the national level, has resulted in a global economy which increasingly has no place for economic and monetary policies which are pursued purely at the national level. Similarly, while the Bretton Woods monetary system established after 1945 reserved special status for the US Dollar, the number of currencies having 'global' status has expanded in number, thereby removing the linkage to their respective political masters.

10.6.2 International Systems of Exchange

International trade has grown significantly in the post-war period and with it the associated monetary flows. More recently, deregulation and globalization have led to a spectacular growth in the value of non-trade-related financial transactions. Every transaction whether trade- or non-trade-related gives rise to obligations that need to be settled through a transfer of money between the parties involved. Settlement of non-trade-related and large value trade transactions is increasingly based on the electronic large value payment systems which have been developed since the 1960s. Together this has led to a major expansion in payment and settlement systems. These now handle payment volumes on a daily basis which collectively dwarf economic output in the main industrial countries.

The increasing emphasis on non-trade-related settlement has created an agenda of concerns which are increasingly divorced from the issues faced by businesses and individuals seeking to make lower value transfers. The huge values created by the foreign exchange and securities businesses operating on a global scale create separate agendas as concerns to mitigate the ever-increasing risks associated with settlement grows. Discussions revolve around reducing systemic failure of the settlement system by either 'netting' and/or real time gross settlement (RTGS). However, these issues remain remote for the millions of individual businesses operating at national and increasingly international levels who remain locked into inefficient and time-consuming paper-based payment and settlement systems, particularly when trading is across national borders and involves different banking systems.

10.6.3 Banking and Securities Markets

Non-trade related international and domestic financial transactions have grown substantially both in absolute terms and relative to the growth in trade. For example, the world foreign exchange market alone is estimated to be worth more than 1 trillion dollars per day in 1995 compared to total world trade in goods and services of only \$4 trillion. In other words, four days of foreign exchange trading equates to the total requirement for trade-related foreign currency purchases over a 12-month period. Elaborate settlement systems are being developed to contain the burgeoning risks which are involved. The overall rate of increase has been substantial in the past 15 years. In Japan, for example, the annual value of transfers of funds jumped from 20 times national output in 1980 to 120 times in 1990.

The past 25 years has seen a progressive globalization of world securities markets. While the speculative flow of funds into the world's emerging equity markets has declined from their peak in 1994, commentators identify them as a key source of future growth in the late 1990s. Standard Chartered Bank estimates that the size of emerging markets in terms of market capitalization is set to double to 4 trillion US dollars within the next five years, whereas others estimate that if present growth rates continue, these new markets could account for around half the world's equity market capitalization by 2015. McKinsey & Company suggest that world capital markets are being integrated more rapidly than was generally expected. The acceleration of this trend has led to a consequent expansion of the international payment system and a consequent boom in financial assets.

Attempts to establish universal international payment systems which can be used cost-effectively for the full range of transactions have to date been unsuccessful. A failure to agree on common standards has meant that a major proportion of the instructions which are sent by banks follow a free messaging format. When messages are on free format (unrecognized universally) recipients have to interpret and to rekey them, involving higher levels of cost, more time and making the systems much more prone to the introduction of errors. At the same time there is a countervailing pressure to settle transactions, particularly those relating to securities, more quickly.

The large investment institutions, be they United Kingdom investment trusts, US pension funds or Japanese life insurance companies, are pushing for more rapid settlement periods. Global settlement is increasingly moving towards three-day settlement. Citicorp estimates that by the year 2000, 50-60 per cent of trades will be settled on the day of trade, and the rest within three days. The ISITC (Industry Standardization for Institutional Trade Communication), which is an independent forum of representatives in the US and Europe, is working with the principal electronic payment system providers to extend the use of payment messaging formats which can be used across a range of networks throughout the banking and securities industry. However, there are fears that attempts to create a universal messaging system are being delayed by the lack of a perceived need for consensus. The major global securities clearers are Euroclear and Cedel.

10.6.4 Payment and Settlement Systems Overview

A mixture of different payment systems has evolved to service the growing requirements of both trade and non-trade-related commerce. In the majority of cases, these systems operate as closed proprietary networks, creating incompatibilities between different systems. There is a particularly sharp division between the payment and settlements systems which are used for large value transfers and those which are available to settle smaller payments, particularly on a cross-border basis. This has led to an inverse relationship between the volume and the number of transactions. It has also further accentuated

the division between large multi-national corporations and smaller enterprises wishing to utilize electronic systems for making payments. For example, a large proportion of current global trade is controlled by large multinational companies who are largely trading within their own network of subsidiary companies. These large corporations seek to minimize the costs of transfers within their operations while preserving the legal integrity and tax status of the companies concerned. Smaller companies which do not have access to these networks are forced to rely on a paper-based system of documentary credits. These are generally very time-consuming as well as costly to buyer and seller alike.

This section discusses the various payment systems which are in use and the types of payment transaction for which they are used. As already identified, the issues which concern the operators of the large value payment systems are often different from those which are the focus of smaller traders. Banks which operate the former are increasingly concerned with the systemic risks which are associated with the huge monetary values which are involved. There is a move to more elaborate real time settlement systems which would be inappropriate for the much smaller denominations involved in trading on a cross-border basis by small and medium-sized enterprises (SMEs). Similarly, the degree of direct central bank supervision required for the large value payment systems is much greater and will be at variance with the objective of minimizing cost by achieving automation for low value payments. Companies involved in making trade-related transfers are likely to require less direct supervision in order to achieve the lowest transaction costs and timeliness of transfer. This would suggest that there will be an increasing divergence between large value payment and settlement systems used for a relatively small number of individual transactions. Large value payment systems will focus on the global foreign exchange and financial securities markets that are growing rapidly in size and complexity. These networks can be expected to remain proprietary and closed with close supervision exercised by central monetary authorities. Trade and commerce-related settlement systems, on the other hand, will need to move to a more open systems environment, minimizing transaction costs and opening up the opportunities which follow when smaller scale transactions can be settled on a cost-effective basis.

According to UNCTAD (the UN Conference on Trade and Development), the costs of paperwork and other complex formalities associated with cross-border trade flows can amount to about 10 per cent of the final value of goods. A typical trade transaction may involve several different parties and different documents, all of which have to be checked, transmitted, re-entered into various information systems, processed and filed. UNCTAD believes that this represents a major impediment to the growth of world trade, particularly for the industrialized countries. UNCTAD believes that unnecessary transaction costs amount to more than US dollars 400 billion a year, which could be reduced by 25 per cent or more by streamlining procedures and extending the use of paperless trading. Providing automated low value payment settlement is likely to be at the center of such changes, although to be effective, other major regulatory and institutional changes will have to follow in due course.

10.7 ONLINE SHARE DEALING

Online Share Dealing is another name of Online Share Broking. It makes easy share trade through online share dealing services.

Online Share Dealing is flattering the order of the day in share trading. Now-a-days one could hardly see a person going to the stock exchange floor and placing his order. Electronic media has played an vital role in flourishing the share market. In case of online share dealing an investor could place his order from his own house if he has internet connection.

In previous days the brokers went to the stock exchange floor and place their clients' order. But now through the help of the satellite the broker can have his own trading system from his desired place. This system is known as VSAT system. In turn they also give connection to their clients through internet for performing online share trading. The client could avail the share market from any place he wants provided he has a computer with an internet connection.

Online Share Dealing services involves:

- i. Trading facility via internet in the modified computers
- ii. Fast Transactions
- iii. Low brokerage or commission according to trading types (intraday or delivery) and the commission gets reduce with increased volume of trade
- iv. Free share investment advices and tips supplied online and on a real time basis
- v. Share performance graphs and statistical tools
- vi. Free Brochures on equity trading
- vii. Free brochures on investment plans such as Pension Plans, Plans on Shares, etc.
- viii. Free annual reports from companies that one follows for investment

One time a person opens an online trading account with a broker-dealer then the investment in his/her preferred companies become easy, time saving and hassle free. The investor could place orders by his own from his own PC offer it has internet facility in it. There is also a facility of compiling one's preferred shares for investment in an Online Stock Watch. This helps an investor to keep a watch on his investments and their comparative progress. Thus it enables an investor to keep an efficient track on his portfolio.

Online Share Trading Supplies the following Informations on a Real time Basis:

- Best Buy and Sell order
- Placing Buy/Sell order
- Volume
- Traded Value
- Today's High and Low
- Change of price of the share from last day (both in absolute and percentage terms)
- 52 week High and Low
- Stock tips
- Graphs and Charts

Basically, Online Share Dealing is only execution of the shares. It also has two variants and changes with the change in brokers.

- The majority of the brokers hold share certificates of the investor in a nominee account on his behalf. With every implementation of orders the documents first goes to the nominee account of the broker and in turn it is being forwarded by him to the investor. Dividends and profits accrued by the investor first goes to the nominee bank account and then to the client's account.

- There are some brokers (very few in numbers) who give their clients the ability of holding share certificates in their own name. The main benefit of this facility is that it is not mandatory to square up the open position through the same broker he took that position through. Here the dividend and profit is directly sent to the investor in the form of a cheque. Documents (takeover announcements, proposals related to restructuring, etc.) are directly sent to the investor via post.

Disadvantages of Certificate Dealings are:

- (a) Longer resolution periods and
- (b) Moderately more Expensive

10.8 E-DIVERSITY

Diversity eCommerce (DeC) today proclaimed the completion of the addition of the Business Research Services (BRS) database of women and minority-owned businesses to its growing online e-commerce Exchange.

The Diversity e-commerce Exchange is focused completely on the facilitation of eCommerce within the minority procurement market.

Business Research Services publishes listings of minority companies that are dispersed throughout the United States, Puerto Rico, the Virgin Islands and Guam. The database, covering almost 1,000 industries, includes all of the pertinent company information needed to initiate a business relationship with these minority companies. The company was founded in Chicago in 1984 and now has headquarters in Washington, D.C.

Tom Johnson, President of BRS, stated, "By establishing this alliance with DeC, we will together contribute to advancing the use of minority-owned businesses by major corporations and governmental agencies."

"The accumulation of this database to the DeC Exchange is an important step in our strategy to become the largest Internet Exchange for the minority procurement market," added Anna Gallegos Brannon, CEO of Diversity e-commerce. "We will be actively encouraging participation in our e-commerce workshop programme that is geared to helping minority companies remain competitive in this new way of doing business."

There is ordinary agreement that the trend toward conducting business electronically has the potential of eroding the competitive position of many minority-owned companies. The process of adding e-commerce capability to these businesses is an enormous task.

"The process engages Internet technology training, Web presence, and e-mail capability. Diversity e-commerce offers all of these," added Johnson.

"Being on the World Wide Web among millions of other sites is merely not enough," continued Brannon. "A minority company must be on a site that the procurement market knows about as being populated with many certified alternative suppliers. After that, the company needs to be trained on the protocols of electronic commerce. We combine the two into a single powerful solution."

Corporate members of the Diversity e-commerce Exchange can contact the list of minority-owned suppliers at www.diversityecommerce.com. Those wishing to join the Exchange should call the company at 562/436-9191.

Diversity e-commerce is a Women and Minority-owned company (WMBE) that is certified by the Southern California Regional Purchasing Council.

10.9 TECHNOLOGY ADOPTION

Attracted by the potential opportunities offered by the Internet for market and communication diversification, small and medium enterprises in Botswana, like elsewhere, adopt ICTs, hoping to better their performances.

Attracted by the prospective opportunities obtainable by the Internet for market and communication diversification, Small and Medium Enterprises (SMEs) adopt Information and Communication technologies (ICT), hoping to improved their performances. This study assessed the adoption of e-commerce by SMEs in Botswana. It aimed at finding out the factors that led to e-commerce adoption, the type of e-commerce technologies that were adopted and used, as well as the services provided with these technologies. It also identified the challenges faced by SMEs with regard to e-commerce use. A review design was adopted in the form of a structured questionnaire, which was used to collect data from a sample of 145 SMEs. Analysis took the form of computation of means and frequency distributions. Findings revealed that the point of sale system was the most widely used e-commerce technology and the major reason for e-commerce technology adoption was competitive advantage. The main challenge faced by the firms in their use of e-commerce technologies was threat to security. The results clearly indicate the necessity to provide support to SMEs if they are to successfully adopt and use e-commerce. The results have implications not only for managers of SMEs but also for government bodies in developing countries such as Botswana.

Check Your Progress

Fill in the blanks:

1. Encryption and generally require the use of some secret information.
2. A digital signature binds a document to the of a particular key.
3. A firewall is a to keep destructive forces away from your property.
4. Preparing a Unique Selling (USP) for your company is a great way to begin.
5. Money and systems have also been strongly linked to the role of the state.

10.10 LET US SUM UP

Information security is provided on computers and over the Internet by a variety of methods. A simple but straightforward security method is to only keep sensitive information on removable storage media like floppy disks. People put lot of pages on their first website, which may have many pages and it is very common mistake people do of dumping all the web pages into a single directory. Will the system be used, if it is implemented? Will there be resistance from users? This is necessary because "equipments do not cry but people do cry". The existing personnel normally worry about job security, loss of per group, changes in job context and so on whenever new systems are proposed. Online Share Dealing is another name of Online Share Broking. It facilitates share trade through online share dealing services. Diversity eCommerce (DeC) today announced the completion of the addition of the Business Research Services (BRS) database of women and minority-owned businesses to its growing on-line eCommerce Exchange. Attracted by the prospective opportunities offered by the Internet for market and communication diversification, small and medium enterprises in Botswana, like elsewhere, adopt ICTs, hoping to better their performances.

10.11 KEYWORDS

ISITC: Industry Standardization for Institutional Trade Communication

SME: Small and Medium-sized Enterprises

UNCTAD: UN Conference on Trade and Development

WMBE: Women and Minority-owned company

USP: Unique Selling Proposition

BRS: Business Research Services

DeC: Diversity eCommerce

10.12 QUESTIONS FOR DISCUSSION

1. Explain the elements of e-commerce.
2. What are the main steps of internet e-commerce security?
3. Discuss the website evaluation model.
4. Explain the working of Internet Bookshops and Internet Banking.
5. Discuss how shares can be deal online?
6. What are the various diversity in e-commerce?

Check Your Progress: Model Answer

1. decryption
2. possessor
3. barrier
4. proposition
5. monetary

10.13 SUGGESTED READINGS

Kienam, *Managing Your E-Commerce Business*, Prentice Hall of India, New Delhi.

Kosiur, *Understanding E-commerce*, Prentice Hall of India, New Delhi.

Kalakota, Whinston, *Frontiers of Electronic Commerce*, Addison Wesley.

Schneider P. Grey, Perry T. James, *E-Commerce*, Thomson Learning, Bombay.

Shurety, *E-business with Net Commerce (with CD)*, Addison Wesley.

Napier, *Creating a winning E-business*, Vikas Publishing House, New Delhi.

Didar Singh, *E Commerce for Manager*, Vikas Publishing House, New Delhi.

Whitely David, *Electronic Commerce*, TMH, New Delhi.