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# **LESSON: 1**

## **INTRODUCTION TO E-COMMERCE**

**Subject: E-Commerce**

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**Vetter :**

### **STRUCTURE**

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## **1.0 OBJECTIVE**

E-commerce is changing the way of doing business. The objective of this chapter is to get the students acquainted with the basic concept of E-commerce. This chapter highlights the basic elements e-commerce, the difference between traditional and electronic business.

After reading this chapter, you will be able to:

- Describe the concept of E-commerce
- Explain different levels of E-commerce
- Analyze the SWOT of E-commerce
- Identify the different forces that drive the e-commerce.

## **1.1 INTRODUCTION**

In the past few years, enterprises across the globe have experienced significant changes in their business information system. Huge investments were made in enterprise resource planning system implementations but still they struggle to get timely information that is needed to make effective business decision and to ensure continuous growth of enterprises. Placing "e" in front of any process or function seemed to be the magic prescription for never ending story of success and rapid returns for enterprises. E-business, e-procurement, e-sales, e-payment, e-banking, e-CRM, e-CAD, e-delivery are just a few. Internet, for example is becoming one of the most popular medium in transmitting various data. Users can find any kind of information within a shorter time compared with conventional method that consumes more time.

The emergence of the Internet through out the world has been contributing such a variety medium in doing business as well as people lifestyle. In fact, Internet is the essential prerequisite for the existence of E- commerce. Electronic commerce or e-commerce has been defined as the ability to perform transactions involving the exchange of goods or services between two or more parties using electronic tools and technique. The explosion of E-commerce has created new phenomena in our lifestyle especially in shopping

activities. Consumers can easily buy products or services like magazines and airlines tickets via Internet.

## **1.2 DEFINITION**

The word commerce is the basic concept for electronic commerce, pertaining to buying and selling of goods while 'commercial' denotes business practice and activities intended to make profits. Electronic commerce, like any other business, deals with the exchange of money for soft or hard goods and services.

Kalakota and Whintons in 1997 defined the term E-commerce from different perspectives. These perspectives are:

- Communication
- Business Process
- Service
- Online

***Communication Perspective:*** According to this perspective, E-commerce is the delivery of information, product/services or payments over tele-communication channels, computer networks or any other electronic mode of communication.

***Business Process Perspective:*** This says that E-commerce is the application of technology towards the automation of business transactions and work flow.

***Service Perspective:*** E-commerce is defines as a tool that addresses the desire of firms, consumers and management to cut service cost while improving the quality of goods/services and increasing the speed of service delivery.

***Online Perspective:*** E-commerce provides the capability of buying and selling products and information on the internet and other online services.

The term commerce is treated as transaction between business partners. Therefore, the term e-commerce seems to fairly narrow to people. Thus some time we use the term e-business. It is a broader definition of e-commerce. There is confusion among the consultants and the academicians over the use of this term. Some think that e-commerce encompasses all world of electronically based organizational activities that support a firm's market exchanges – including a firm's entire information system's infrastructure. On the other hand, some argue that e-business encompasses the entire world of internal and external electronically based activities including e-commerce.

“E-commerce has the potential to unleash enormous savings and business efficiencies, but the practicalities remain elusive. How will e-commerce change the global planning and purchasing of transport and logistics in the supply chain? Logistics has been described as the key enabler for e-business – but how can individual logistics and transport companies ensure that they benefit from, rather than perish in, the e-commerce revolution?”

Electronic Commerce (e-commerce) is electronic business. It's using the power of computers, the Internet and shared software to send and receive product specifications and drawings; bids, purchase orders and invoices; and any other type of data that needs to be communicated to customers, suppliers, employees or the public.

E-commerce is the new, profitable way to conduct business which goes beyond the simple movement of information and expands electronic transactions from point-of-sale requirements, determination and production scheduling, right through to invoicing, payment and receipt. E-commerce uses key standards and technologies including Electronic Data Interchange (EDI), Technical Data Interchange (TDI), Hypertext Mark-up Language (HTML), Extensible Mark-up Language (XML), and the Standard for Exchange of Product model data (STEP). E-commerce is made possible through the expanded technologies of the Internet, the World Wide Web, and Value-Added Networks.

The Internet is a world wide collection of computer networks, co-operating with each other to exchange data using a common software standard. Through telephone wires and satellite links, Internet users can share information in a variety of forms. The size, scope and design of the Internet allows users to connect easily through ordinary personal computers and local phone numbers, exchange electronic mail (E-mail) with friends and colleagues with accounts on the Internet, post information for others to access, and update it frequently, access multimedia information that includes sound, photographic images and even video, and access diverse perspectives from around the world. An additional attribute of the Internet is that it lacks a central authority—in other words, there is no "Internet, Inc." that controls the Internet. Beyond the various governing boards that work to establish policies and standards, few rules and answers to no single organization bind the Internet.

Different people use different terminology such as 'electronic trading' 'electronic procurement' 'electronic purchasing' or 'electronic marketing'. From the above definition, we can conclude that electronic commerce is often used in a much broader sense, to mean essentially the same as 'electronic business'. In other words e-commerce includes purchases of goods, services and other financial transactions in which the interactive process is mediated by information or digital technology at both locationally separate, ends of the interchange. Here 'transactions' include both specification of goods and service required and commitment to buy. E-commerce transaction model can be in terms of business to business (B2B), business to customer (B2C) or customer to customer (C2C).

### **1.3 FEATURES OF E-COMMERCE TECHNOLOGY**

Electronic Commerce means better business communication and data interchange information is essential for every and any business. The quality and quantity of information which a business delivers to customers or use this information to make decisions can determine just how competitive the business is.

A company already may be using a number of electronic based tools to help acquire and extend information and communication needs. These may include personal computers, word processors, courier, facsimile machines, telex services, cellular phones, pagers and more. Unfortunately, many of today's communication tools are not really upto the speed of today's business needs, and can actually create barriers to achieving the goals set on the basis of strategies formulated by a company.

For instance, postal facilities can keep business waiting for information for days or even weeks. Overnight couriers may save time but can be an expensive proportion. Traditional telex and fax is quick but costly and communicating by telephone can become an endless game of tag.

Now a business can avoid these problems by using e-commerce which is fast, cost efficient, time saving and easy to use -i.e., economic tangibility and good business generation.

Electronic business can result in better transactions, wide market coverage by offering the benefits of speed, convenience, being cost effective, timeliness, high profit margins, instant customer relations, no loss of customers, impact and control- all are a fraction of the past traditional business methods. A concern can do everything it can to run its business efficiently and profitably.

Application of electronic operations to commercial activities means better business solutions. It greatly facilitates a firm to make better decisions, sale forecasts, prices and other valuable information can be sent and received instantaneously. A business will always have the information it needs faster, easier and more completely in the new system of communication than ever before.

This enables firms to have an edge over competitors by informing, following up and requesting information faster and easier to customers.

Another feature is that it helps to maintain greater control, at work, home or while traveling, communicate with any business partner or firm, anywhere instantly.

### ***Improve Responsiveness***

How does e-commerce help business? It helps by improving responsiveness to market conditions and customer preferences. Every business must know how important timing is to marketing and selling products. Timing is important to cater to the demands of customers.

If distributors, dealers and sales force do not get the right information at the right time, there will be a financial crisis as well as losing valuable customers.

E-commerce network enables a company to implement marketing programmes with greater precision such as :

- Pre-empt competitiveness with a change in marketing tactics before they can react.
- Improve responsiveness by revising price change and marketing programmes as and when required.

### ***Expedites and Streamlines Reporting***

It has been an experience in conventional commercial practices with factors like delays and ineffectiveness in reporting systems crippling effectiveness. Responsive, timely information flows from sound management systems. Electronic commerce improves delivery and distribution both within and outside organisations. The benefits are:

- Stored lists of key recipients facilitate distribution.
- Electronic delivery time.

### ***Coordinates Sales Efforts***

Some marketing studies reveal that most sales people spend nearly 75 per cent of their time on the roads, relying heavily on telephone calls for contact with their head officers



and customers. Telephone tag makes an endless frustrating game out of tracking down leads and following up to authenticate sales calls. In addition, misplaced or undelivered information results in low sales records. Other benefits of electronic business are:

- Eliminating telephone tag.
- Sending and receiving message at convenience.
- Linking sales team numbers to gather, including international representatives, and
- Closing sales without delays.

### ***Effectiveness and Efficiency***

Electronic commerce can increase the efficiency and effectiveness of public relation programmes, broadcast press releases, financial updates and other corporate communications. Copy reviews and approvals are expedited by circulating instant messages to key internal and external contacts.

### ***Close Contact with Clients***

In any business where maintaining close contact with customers is a priority consideration, electronic business can increase responsiveness of the company' and ensure customer satisfaction. Appointment confirmations, requests for information, follow-up reports and electronic data interchange can be effected with greater efficiency using instant messages.

### ***Planning and Execution of Meetings***

The mechanism of electronic operations in business facilitates planning and execution of meetings. Executive management meetings, seminars, workshops, symposia and conventions take a great deal of time and effort to manage. Arrangements must be coordinated among a variety of diverse groups in different locations e.g., hotels, speakers, exhibitors, attendees, the media etc. Reports and surveys need to be distributed before and or after, the event. And there are always the headaches of late breaking events and last minute announcement. In an electronic business environment, video-conferences,

document conference, computer-based conference, which offer companies the flexibility of both electronic and paper distribution, can make these jobs easier and more effective.

<b>SEVEN UNIQUE FEATURES OF E-COMMERCE TECHNOLOGY</b>	
<b>Dimension of E-commerce Technology</b>	<b>Significance in Business</b>
<p><b>Ubiquity</b> Internet/Web technology is available every where: at work, at home, and elsewhere via mobile devices, anytime.</p>	<p>The marketplace is extended beyond traditional boundaries and is removed from a temporal and geographic location. “Marketspace” is created; shopping can take place anywhere. Customer convenience is enhanced, and shopping costs are reduced.</p>
<p><b>Global Reach</b> The technology reaches across national boundaries, around the earth.</p>	<p>Commerce is enabled across cultural and national boundaries seamlessly and without modification. “Marketspace” includes potentially billions of consumers and millions of businesses worldwide.</p>
<p><b>Universal Standards</b> There is one set of technology standards, namely internet standards.</p>	<p>There is one set of technical media standards across the globe.</p>
<p><b>Richness</b> Video, audio, and text messages are possible.</p>	<p>Video, audio, and text marketing messages are integrated into a single marketing message and consuming experience.</p>
<p><b>Interactivity</b> The technology works through interaction with the users.</p>	<p>Consumers are engaged in a dialog that dynamically adjusts the experience to the individual, and makes the consumer a coparticipant in the process of delivering goods to the market.</p>
<p><b>Information Density</b> The technology reduces information costs</p>	<p>Information processing, storage, and communication costs drop dramatically, while currency, accuracy, and timeliness</p>

and raises quality.	improve greatly. Information becomes plentiful, cheap, and accurate.
<b>Personalization / Customization</b> The technology allows personalized messages to be delivered to individuals as well as groups.	Personalization of marketing messages and customization of products and services are based on individual characteristics.

### **NEED FOR E-COMMERCE**

The global business environment is moving faster than ever before. Increased competition at home and abroad means quality as well as profitability must be preserved by corporate houses. This pressure has led to a reappraisal of the accepted existing business practice in the search for greater efficiency.

Traditionally, the response in the face of competitive threat has been to reduce costs by L rationalizing production, shedding labour and restructuring business, coupled with investments in technology to improve productivity and generate profit.

Whether business to business (B2B) or business to customer (B2C) there are benefits to all parties, customers or suppliers. A reduction in acquisition times and costs, lower prices for goods and services, an expanded number and quality of suppliers, an increase in buyer productivity. Better management information and better inventory control is possible. A Reduction time to market is also achievable giving improved operating efficiencies and improved product quality at reduced cost. The payment process can also be improved and finally and most importantly a greatly expanded customers base. B2B e-commerce was born out of an attempt to solve an administrative problem. It developed a new computer standard to handle these needs, which became known as EDI, Electronic Data Interchange. Today its descendant, XML, a lighter, simpler data interchange standard is used by B2B sites. Simple e-commerce sites first appeared in 1992. The early e-commerce sites were virtual catalogues, simply listing products for sale. Ordering was off-line, through e-mail, phone or fax. By 1996 the technology had advanced greatly to produce virtual stores with shopping carts, client accounts and, with the development of protocols such as Secure Socket Layer (SSL), enabled customers to

order and pay for their purchase on-line directly by credit card. E-commerce quickly became popular with consumers and suppliers. For customers, it was fast, easy and efficient, allowing them to compare products, price and service before purchase. For suppliers, it allowed them to reach an unlimited international audience, 24 hours a day, 7 days a week at reduced costs. Today e-commerce is widely used and growing fast. B2B is the largest, fastest growing and most profitable market. According to IDC, this year, it is expected to account for two thirds of world wide e-commerce. B2C is also expected to grow, boosted by Broadband (high-speed) Internet access to more on-line households. Future advances include digital money and e-wallets, and 'personal agents' that help users find what they are looking for. Sites can work with fulfilment centres providing customers with excellent service and suppliers with information, and can support the newest trend for human interaction in E-commerce customer service. The Internet is creating unprecedented and seeming infinite opportunities for both customers and businesses. Yet it one of its major problems is that it is changing so fast that both parties are overwhelmed by the speed of change and the sheer number of choices available to them. In addition web businesses win by following rules quite different than those which traditional businesses may follow.

E-commerce appears to be exempt from the kinds of constraints that have limited companies historically. An e-commerce environment handled in a proper manner, with the right customisation of products and services, in innovative ways, can lead to win-win situations. The customers can get the right product at the right time and for the right price, companies can set new standards in efficiency and profitability.

#### **1.4 INTERDISCIPLINARY NATURE OF E-COMMERCE**

Electronic commerce, being a new field, is just developing its theoretical or scientific foundations. It is based on several disciplines. The major disciplines of E-Commerce with some samples of issues with which they are concerned follow:

##### ***Marketing***

Many issues of marketing offline are relevant to online E-Commerce - for example, cost benefits of advertisements and advertisement strategies. Other issues are unique to E-Commerce, ranging from online marketing strategy to interactive kiosks.

### ***Computer sciences***

Many of the issues in the infrastructure of E-commerce, such as languages, multimedia, and networks, fall into the discipline of computer sciences. Intelligent agents play a major role in E-Commerce as well.

### ***Consumer behavior and Psychology***

Consumer behavior is the key to the success of B2C trade, but so is the behavior of the sellers. The relationship between cultures and consumer attitude in electronic market is an example of a research issue in the field.

### ***Finance***

The financial markets and banks are one of the major participants in E-Commerce. Also, financing arrangements are part of many online transactions. Issues such as using the Internet as a substitute for a stock exchange and fraud in online stock transactions are a sample of the many topics of the field.

### ***Economics***

Electronic commerce is influenced by economic forces and has a major impact on world and country economies. Also, theories of micro and macro-economics need to be considered in E-Commerce planning, as well as the economic impacts of E-Commerce on firms.

### ***Management Information Systems (MIS)***

The information systems department is usually responsible for the deployment of E-Commerce. This discipline covers issues ranging from systems analysis to system integration, not to mention planning, implementation, security, and payment systems, among others.

### ***Accounting and Auditing***

The back-office operations of electronic transactions are similar to other transactions in some respects, but different in others. For example, auditing electronic transactions presents a challenge for the accounting profession; so does the development of methodologies for .cost-benefit justification.

### ***Management***

Electronic commerce efforts need to be managed properly, and because of the interdisciplinary nature of E-Commerce, its management may require new approaches and theories.

### ***Business Law and Ethics***

Legal and ethical issues are extremely important in E-Commerce, especially in a global market. A large number of legislative bills are pending, and many ethical issues are interrelated with legal ones, such as privacy and intellectual property.

### ***Others***

Several other disciplines are involved in various aspects of E-Commerce to a lesser extent- for example, linguistics (translation in international trades), robotics and sensory systems, operations research / management science, statistics, and public policy and administration. Also, E-Commerce is of Interest to engineering, health care, communication, and entertainment publishing.

## **1.5 LEVELS OF E-COMMERCE**

Electronic commerce is the process of conducting commercial transactions electronically over the Internet. This process is carried out primarily in five levels, and the main aspect of e-commerce is a merchant selling products or service to the consumers.

There are five major segments under the broader category of e-business. However, the following are some popular e-commerce models used by companies engaged in e-commerce:-

- Business to business e-commerce (B2B)
- Business to consumers e-commerce (B2C)
- Consumers to consumers e-commerce (C2C}
- Business to employees e-commerce (B2E) and
- Consumer to business e-commerce (C2B)

### **Business to Business E-commerce (B2B)**

E-business is the process of conducting business on the Internet. Its scope includes not only buying and selling but also services, fulfilling the needs of customers and collaborating with business partners.

Business to business e-commerce is smart business. The opportunity for business to business e-commerce is even greater.

A wholesaler may sell products to the retailer. There are advanced e-commerce software which support multi-tier pricing. This helps to set up online stores to offer preferred pricing to some vendors and shared price to others.

This includes internet-enabled initiatives of an enterprise to form commercial linkages with another enterprise, dealer, warehouse or manufacturer. In this form of e-commerce, e paperwork and time-to-market get vastly reduced. Throughout the world, this e-commerce mode is the biggest.

In a B2B transaction, the interaction is between businesses. For example, a website that is catching for the steel industry might have facility for buyers and sellers to list their requirements and post their products. It helps them in quickly closing the transactions and the buyer can get quality, material and can choose from different suppliers.

B2B commerce is a growing business in the e-commerce arena- with the increasing use of the internet, more and more business are realizing the commercial advantage of giving business clients a streamlined and easy manner to order products or service online. It facilitates access to the ordering process to only those with whom a concern has a commercial relationship.

Business to Business e-commerce provides small and medium enterprises (SMES) with an excellent opportunity to access new markets, improve customer service and reduce costs. And while hurdles exist, they should be viewed more as speed breakers rather than road barriers. As a medium of information storage and dissemination, the internet has and is emerging a clear winner. Its rate of penetration has far outpaced the growth of other popular media such as newspaper, radio and television.

B2B transactions are however relatively high value in nature and organisations are slow to change their traditional systems for the supply chain management. The reasons for the growth in B2B e-commerce are many. In an increasing competitive scenario, e-commerce offers highly attractive cost saving options. The shift to this process is often driven by the needs of buyers.

Innovative methods of enhancing B2B and B2C levels of e-commerce include:

- CD-ROM catalogues that are linked to the user's online catalogue, enabling him to browse offline and order online.
- Kiosks placed at physical store locations or in shopping malls to introduce users to the easy online ordering options.
- Extranets to link businesses together that conduct regular business to .business transactions and



- Affiliate programmes to drive business to your commerce site from other content related sites.

B2B e-commerce is expected to be the largest mode of transacting e-business and is a global phenomenon. It involves taking internet enabled initiatives to form commercial links with other enterprises, dealers or manufacturers. In this form of e-commerce, a business firm places orders for supplies with another business firms directly over the Internet. Paperwork and time required for processing the order and delivery of the goods are thus reduced to a great extent.

### **Business to Consumers E-commerce (B2C)**

It is for the customers to buy stores from the web. The problem to be recognized in this is to secure payment, using encryption, transaction integrity, quick response, time and reliability.

B2C e-commerce involves selling of goods and services to consumers or end users. It allows them to browse the product catalogue, select products or services and complete the order online.

In a B2C transaction, the interaction is between a consumer and the preferred business. For example, the most popular site is amazon.com, which is the first online bookseller which has proved a potential competitor to the traditional bricks and mortar booksellers such as Barrens and Noble.

In this category of e-commerce, businesses use the internet to offer to consumers sales and services around the world 24 hours a day, seven days a week and 365 days a year, The sites Amazon, Rediff and Uphar are among those belonging to this category. These websites are meant for selling goods directly to consumers through the internet. The two-way accessibility of the internet enables operating companies to directly ascertain customer preference and buying trends. Businesses are using these consumer insights to formulate marketing strategies and offer to the customers what they want and when they

want. E-business in this mode significantly reduces the costs associated with intermediaries, service centres and mass marketing campaigns. Since e-commerce makes just in time delivery possible, the supplier does not have to store the goods. He can procure them from the suppliers as and when he gets the order from the buyer through the internet.

B2C is the most popular form of e-commerce, wherein the individuals are directly involved in B2C e-commerce, and businesses use the internet for offering their products or services 24 hours a day through global access. The sites Amazon.com and Rediff are among these. These websites sell goods directly to consumers over the Internet. The two way accessibility feature of the internet enables operating companies to ascertain consumer preferences and buying trends directly.

### **Consumer to Consumer E-commerce (C2C)**

Here interaction is between consumer to consumer. For example, in sites like e-Buy Bid or Buy.com, Baazi.com which are auction sites, one can virtually sell and buy any goods (either used or new ones).

This form of e-commerce is nothing but the cyber version of the good old auction houses. If anyone wants to sell anything, all one has to do is post a message on the site, giving details of the product and the expected price and wait for an interested customer to turn up and buy it. The buyer gets in touch with the seller through the Internet and the deal is crossed once the amount is finalised. Online message boards and barbers are also examples of C2C e-commerce.

### **Consumer-to-Business E-commerce (C2B)**

E-commerce, by empowering the customer, has been strategically redefining business. An example of C2B model of e-commerce is the site Price line.Com, which allows prospective airline travellers, tourists in need of hotel reservations etc. to visit its websites and indicate their preferred price for travel between any two cities. If an airline is willing

to issue a ticket on the customers offered price, the consumer can then travel to the mentioned destination at his terms.

### **Business to Employees E-commerce (B2E)**

This is concerned more with marketing a corporation's internal processes more efficiently. Customer care and support activities also hold ground. The requirement is that are all self-service with applications on the web that the employees can use themselves.

## **1.6 SWOT ANALYSIS**

### **Evaluating Business Unit Opportunities**

Now that we have learned how to identify industry value chains and break each value chain down into strategic business units, we can learn one popular technique for analyzing and evaluating business opportunities. Most electronic commerce initiatives add value by the reducing transaction cost, creating some type of network effect, or a combination of both. In SWOT analysis (the acronym is short for Strengths, Weaknesses, Opportunities and Threats), the analyst first looks into the business unit to identify its strengths and weaknesses. The analyst then reviews the environment in which the business unit operates and identifies opportunities presented by that environment and the threats posed by that environment. As shown in the following figure which shows the questions that an analyst would ask in conducting a SWOT analysis.

<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>• What does the company do well?</li> <li>• Is the company strong in its market?</li> <li>• Does the company have a strong sense of purpose and the culture to support that purpose?</li> </ul>	<ul style="list-style-type: none"> <li>• What does the company do poorly?</li> <li>• What problems could be avoided?</li> <li>• Does the company have serious financial liabilities?</li> </ul>
<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>• Are industry trends moving</li> </ul>	<ul style="list-style-type: none"> <li>• What are competitors doing well?</li> </ul>

upward? <ul style="list-style-type: none"> <li>• Do new markets exist for the company's products/services?</li> <li>• Are there new technologies that the company can exploit?</li> </ul>	<ul style="list-style-type: none"> <li>• What obstacles does the company face?</li> <li>• Are there troubling changes in the company's business environment (technologies, laws, and regulations)?</li> </ul>
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SWOT analysis questions

By considering all of the issues that it faces in a systematic way, a business unit can formulate strategies that will take advantage of its opportunities by building on its strengths, avoiding any threats, and compensating for its weaknesses. In the mid- 1990s, Dell Computer used a SWOT analysis to create a strong business strategy that has helped it become a very strong competitor in its industry value chain. Dell identified its strengths in selling directly to customers and in designing its computers and other products to reduce manufacturing costs. It acknowledged the weakness of having no relationships with local computer dealers. Dell faced threats from competitors such as Compaq and IBM, both of which had much strong brand names and reputations for quality at that time. Dell identified an opportunity by noting that its customers were becoming more knowledgeable about computers and could specify exactly what they wanted without having Dell salespersons answer questions or develop configurations for them. It also saw the Internet as a potential marketing tool. The results of Dell's SWOT analysis appears in following figure:

<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>• Sell directly to consumers.</li> <li>• Keep costs below competitors' costs.</li> </ul>	<ul style="list-style-type: none"> <li>• No strong relationships with computer retailers</li> </ul>
<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>• Consumer desire for. one-stop shopping</li> </ul>	<ul style="list-style-type: none"> <li>• Competitors have stronger brand names.</li> </ul>

<ul style="list-style-type: none"> <li>• Consumers know what they want to buy.</li> <li>• Internet could be a powerful marketing tool.</li> </ul>	<ul style="list-style-type: none"> <li>• Competitors have strong relationships with computer retailers.</li> </ul>
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Results of Dell's SWOT Analysis

The strategy that Dell followed after doing the analysis took all four of the SWOT elements into consideration. Dell decided to offer customized computers built to order and sold over the phone, and eventually, over the Internet. Dell's strategy capitalized on its strengths and avoided relying on a dealer network. The brand and quality threats posed by Compaq and IBM were lessened by Dell's ability to deliver higher perceived quality because each computer was custom made for each buyer

### 1.7 THE FUTURE OF E-COMMERCE

In 1996, Forrester Research Institute ([www.forrester.com](http://www.forrester.com)) predicted that B2C would be a \$6.6 billion business in 2000, up from \$518 million in 1996. Then they revised the figure to \$20 billion, and the prediction keeps growing. In 1997, about \$10 billion worth of B2B transactions were conducted over the Internet. Predictions on the total size of E-Commerce vary. For 2010, total online shopping and B2B transactions are estimated to be in the range of \$700 billion to \$4 trillion. Some E-Commerce applications, such as auctions and online stock trading, are growing at a rate of 15 percent to 25 percent per month, and the number of Internet users worldwide is predicted to reach 750 million by 2008. As many as 50 percent of Internet users are predicted to be online shoppers. One indication of the prospect of E-Commerce is the price of E-Commerce-related stocks on the Internet.

Most E-Commerce companies, such as Amazon.com, are not making a profit. They are expanding operations and generating sales growth. It is believed that by 2010 most of the major E-Commerce companies will start to generate sizable profits. Is E-Commerce just another buzzword or is it real? We believe that it is real because of its potential benefits.

### 1.8 THE BENEFITS OF E-COMMERCE

Few innovations in human history encompass as many potential benefits as E-Commerce does. The global nature of the technology, low cost, opportunity to reach hundreds of millions of people, interactive nature, variety of possibilities, and resourcefulness and growth of the supporting infrastructure (especially the web) result in many potential benefits to organisations, individuals, and society. These benefits are just starting to materialize, but they will increase significantly as E-Commerce expands. It is not surprising that some maintain that the E-Commerce revolution is just 'as profound as the change that came with the industrial revolution.

### ***Benefits to Organizations***

The benefits to organizations are as follows:

- Electronic commerce expands the market place to national and international market with minimal capital outlay, a company can easily and quickly locate more customers, the best suppliers, and the most suitable business partners worldwide.
- Electronic commerce decreases the cost of creating, processing, distributing, storing, and retrieving paper-based information. For example, by introducing an electronic procurement system, companies can cut the purchasing administrative costs by as much as 85 percent.
- Ability for creating highly specialized businesses. For example, dog toys which can be purchased only in pet shops or department and discounts stores in the physical world are sold now in a specialized [www.dogtoys.com](http://www.dogtoys.com) (also see [www.cattoys.com](http://www.cattoys.com)).
- Electronic commerce allows reduced inventories and overhead by facilitating “pull” type supply chain management. In a pull-type system the process starts from customer orders and uses just-in-time manufacturing.
- The pull-type processing enables expensive customization of products and services which provides competitive advantage to its implementers.

- Electronic commerce reduces the time between the outlay of capital and the receipt of products and services.
- Electronic commerce initiates business processes reengineering projects. By changing processes, productivity of salespeople, knowledge workers, and administrators can increase by 100 percent or more.
- Electronic commerce lowers telecommunication cost. The internet is much cheaper than value added networks.
- Other benefits include improved image, improved customer service, 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.

### ***Benefits to Consumers***

The benefits of E-Commerce to consumers are as follows:

- Electronic commerce enables customers to shop or do other transactions 24 hours a day, all year round, from almost any location.
- Electronic commerce provides customer with more choices; they can select from many vendors and from many more products.
- Electronic commerce frequently provides customers with less expensive products and services by allowing them to shop in many places and conduct quick comparisons.
- In some cases, especially with digitized products, E-Commerce allows quick delivery.

- Customers can receive relevant and detailed information in seconds, rather than days or weeks.
- Electronic commerce makes it possible to participate in virtual auctions.
- Electronic commerce allow customers to interact with other customers in electronic communities and exchange ideas as well as compare experiences.
- E-commerce facilitates competition, which results in substantial discounts..

### ***Benefits to Society***

The benefits of E-Commerce to society are as follows:

- Electronic commerce enables more individuals to work at home and to do less traveling for shopping, resulting in less traffic on the roads and lower air pollution.
- Electronic commerce allows some merchandise to be sold at lowest prices, so less affluent people can buy more and increase their standard of living.
- Electronic commerce enables people in third world countries and rural areas to enjoy products and services that otherwise are not available to them.
- Electronic commerce facilitates delivery of public services, such as health care, education, and distribution of government social services at a reduced cost and/or improved quality. Health care services, e.g., can reach patients in rural areas.

## **1.9 THE LIMITATIONS OF E-COMMERCE**

The limitations of E-Commerce can be grouped into two categories which are:



- Technical limitations and
- Non-technical limitations

### ***Technical Limitations of E-COMMERCE***

The technical limitations of E-Commerce are as follows:

- There is a lack of system security, reliability, standards and communication protocols.
- There is insufficient telecommunication bandwidth.
- The software development tools are still evolving and changing rapidly.
- It is difficult to integrate the Internet and E-Commerce software with some existing applications and databases.
  
- Vendors may need special Web servers and other infrastructures in addition to the network servers.
- Some E-Commerce software might not fit with some hardware or may be incompatible with some operating systems or other components.
- As time passes, these limitations will lessen or be overcome; appropriate planning can minimize their impact.

### ***Non-technical Limitations***

Of the many non-technical limitations that slow the spread of E-Commerce, the following are the major ones:

#### **Lack of Awareness**

The biggest challenge before successful e-commerce over the Net is that of changing the minds and attitudes of the merchants in tune with the emerging information technology. Further, optimism and strategic business projections are required. If e-commerce has to be an alternate means of doing business in India, a new awareness is needed, something that would cut through the hype and U.S. look alike.

Most of the business people do not understand the significance and implications of the electronic business medium or are unsure of the quality and delivery schedule, physical delivery of goods and mode of payment. Lack of awareness of the technology and its potential benefits are also equally responsible for the poor growth of e-commerce. Lack of interest and willingness to make a paradigm shift has become a crucial issue. Many companies are not willing to accept that their businesses need a revolutionary change to subsist in the potentially digital world. In short, information technology should not be looked upon as an end but as a means to achieve overall development. The IT sector is people intensive, ensuring vast employment opportunities.

The single most important challenge today pertains to increasing awareness of the benefits of e-commerce to potential customers, educate the market and the customers will themselves opt for these services. So, the e-commerce fraternity should accept the fact that the customers are extremely demanding and that they should be geared up towards this end and surpass the expectations of customers. .

### **Lack of Infrastructure**

E-commerce infrastructure development is at its infancy stage in India. This unsatisfactory development is yet another major bottleneck for successful net business in India. The lack of infrastructure, if made available as required, will ensure that the investment in e-commerce starts flowing in because the business is happening and infrastructure will grow. To improve the country's wide infrastructure, major players must come forward to contribute their pie of technology. All the infrastructure framework needed for virtual e-commerce has not been there from the very beginning when it was started, there was a cry for the real shape of the virtual infrastructure for initiating successful e-commerce. This high cost of infrastructure development for e-business is also including the cost of leased lines.

### **Lack of Confidence**

The people in India still show hesitancy in buying through the Net. Lack of quality products, timely delivery of products as some of them tend to go out of stock, lack of

solutions security are the potential reasons for not developing e-commerce. People do not understand this new way of buying and selling products, i.e. the services in a digital environment which are available online.

### **Skeptic Attitude**

Though the Internet is continuing to grow at a rapid rate, along with e-commerce transactions, the shoppers are still skeptical about safety and have not been quick to trust sending personal information such as credit card numbers or address over the Net. Lack of adequate imagination and understanding of what web-based technologies can do to markets and competition only adds to the delay in economic development. The old business habits are demanding and controlling the business. The risk adverse attitude of the people is conspicuous and waiting for others to lead is also another attitude.

### **Credit Cards Frauds**

In India, distribution channels are just one part of the problem related to e-payments. The bigger problem is that of security. All credit cards related transactions are approved offline and given the high incidence of frauds, the banks are extremely wary of approving them. In-fact, there are some unconfirmed reports of a multi-national bank refusing to approve credit card transactions carried out by a large Indian portal.

Other drawbacks may include that the buyers are quite prepared to boot the real mail for e-mail. The e-tailers themselves are not yet ready to keep pace with the potential e-commerce and this brings us to another point. Although e-commerce has the ingredients of being successful, it may have come slightly ahead of its time. The e-commerce mechanism eliminates the need for intermediaries. Unfortunately, this also has negative effects. So, security needs to be extended to customers to gain their loyalty including substantial business.

### **Absence of Tax Laws**

E-commerce over the Net has effectively eliminated national borders. This has posed an important question as to tax on the transactions over the internet. Net business posed

many peculiar technological and legal problems making it difficult to impose tax and formulate a sound taxation policy. The following are the various tax implications of e-commerce:

- There is no fixed physical location for the internet.
- It is difficult to monitor or prevent transmissions of information or electronic cash across the Net.
- Neither the users, administrators nor intermediaries have any control on the type of information, either transactions or cybercash and traveling through their networks.
- There is no emphasis on national boundaries, and messages travel across the boundaries of several countries globally. So, it means no difference, whether the information or electronic money sought to be transmitted are within one jurisdiction or between several.
- A person's location and identity is necessary for tax purposes. Since these two are difficult, the anonymity on the Net would pose a big problem for taxations.
- Electronic commerce eliminates intermediaries or middlemen. Though it is an advantageous feature, it also has negative effects because they could have served as leverage points for collection of tax also as information sources for transactions entered by the customers.
- In addition to technology problems, certain legal hurdles may also be encountered with reference to international taxation laws.
- The difficulties in defining service incomes as distinguished from sale of products, income or royalties cannot be ignored.

So, it is desirable that the Net be turned as a potential free trade zone.

### **Cyber Laws**

Another important problem is lack of comprehensive cyber laws so as to ensure safety and protection. There should not be any legal regulations, or barriers to faster and increased development of e-commerce. The crying need of the hour is urgent action to be

taken by the Government to enact cyber laws including electronic fund transfer, and amendments of official Secrets Act.

Cyber laws are not in place. In other countries, the business community is moving fast ahead, and stringent government regulations are there. The technology is changing the business paradigm so fast; government's ability to proactively change the law is a very difficult task in India.

In addition to them, the fear regarding the security aspects of online transactions without proper government directives and the existing policy machinery contribute to cyber criminality. Adding to them, separate cyber laws and amendments are also required to many existing laws like Companies Act, Evidence Act, Copyright Act, Bankers Book Evidence Act, Indian Penal Code, Contract Act etc. The country entered into a cyber space and documents through the computers should be made acceptable in a court of law. This is actually a big hurdle on the way which would solve one big hurdle for the business-to-business and business- to-customers e-commerce segment.

### **Stock Dilemma**

Many people are not too happy with e-commerce trends. Though online shopping may be growing but so is frustration with it. A key source of dissatisfaction is the out of stock dilemma. In most cases, advertised products or services are not available. The options of feedback and not receiving suggestions are also reasons for annoyance. Many online consumers want more detailed information on their purchases but are not available. The Net is becoming more mainstream and the expectations are also becoming more mainstream.

### **Lack of True Strength**

The presence on the web alone will not always ensure successful e-commerce. Having a website or dot com is no longer a novelty and merely setting up a website will not help companies in increasing the volume of business. They must accept the true strength of.

this new electronic medium of business and its potential for improving efficiency in extending services to the consumers.

There are many people who are connected to the internet but cannot browse the web and they are only availing the e-mail facility for communication.

### **Lack of Skills and Expertise**

Lack of skilled and trained personnel impedes the growth of implementation of IT related e-commerce. The use of the Net for trade requires a complex introduction of servers, browser software and knowledge of web design, hosting, promotion and many more skills. It requires understanding many new things. Many Indian businesses are not prepared to approach electronic commerce. For many business houses for which commerce over internet may not work, would take a lot of efforts for every little return.

### **Internet Outrage**

Failures in networks and the Net itself can play havoc. We read of frequent press reports of internet outrages. The IT industry is not yet attempting to improve network reliability to prevent these outrages. Reliability is a major issue in net business that needs to be attended.

Though worldwide, many business people looking at e-commerce as a blessing, many people also perceived the cyber space as a threat. There are also reported evidences of enforcing new censorship regimes to prevent cyber crimes.

### **Absence of Cyber Brand Image**

Another problem is that advertising on the Net tends to focus on e-commerce rather than on brands found in the real world. This would prove to be a deterrent in ensuring consumer loyalty.

The biggest thing going for it is a brand image and power. Though the already existing name is known and trusted, the issue is how to extend it into the new cyber reality. A

concern should be to preserve the old values of trust and dependability of the brand, and at the same time, keep it upon on the Net. At the same time, the whole business structure will have to undergo a change re-engineered.

### **Inadequate Government Role**

The government is not taking a serious view of e-commerce related information technology in terms of its promotion. Spreading awareness, imparting education, of the benefits of e-commerce, enacting new cyber laws, amendments to existing commercial laws, developing strong, communication infrastructure are the key domestic roles for the government to play. A very small portion of PC owners, non-owners who are aware of e-commerce perception and about the Internet is there which is being identified as the source of information, communication, learning and entertainment, but relatively few amongst them feel that it is a source of purchasing products or services. Government is not playing an active role by enacting different comprehensive cyber laws, bringing amendments to the existing business laws, not formulating a favourable IT policy and not making positive intervention when needed and ensuring adequate infrastructure. The existing negative business environment for development of new IT and telecom technologies cannot be ignored. Technology/solutions providers, special bodies and organisations are not taking suitable steps to educate Indian traditional business persons and customers in the area of e-commerce.

### **No Emphasis on Commercial Exploration**

E-commerce is not so popular and widespread in India rapidly because of several bottlenecks like content migration. Most of the PC users surf the Net for information rather than potential commercial transactions. This means that the market for this migrated content is very large. Many owners use the Net for learning, education, games and entertainment. To convince e-consumers, e-merchants will have to do a lot of education. Many business houses evidently do not come forward to leverage on some projects in the electronic commerce spectrum as it has already done at high speed overseas.

### **No Encouragement from Business Community**

The business community is extremely an important sector to be targeted for the introduction of any technological innovations in business. It means it is the business community that sustains e-commerce and greatly influences the thinking and adoption process of various segments of the society to move forward in the field of information technology. It motivates the people who share the courage and conviction to move the new business paradigm.

### **Preferring Foreign Sites**

Online shoppers in India do not prefer Indian websites to a large extent and prefer US and other foreign websites. There are many reasons for this as they provide better selection, prices, stock, quality products, shipping, payment process security, customer service and wide variety of sites among other things.

### **Inactive Indian Software Houses**

Software houses particularly in India are not devoted to ensuring strong expertise in the supply chain and distribution management solutions. Efforts are lacking to ensure strategic working on development of systems which will provide a comprehensive open-e-business solutions environment, comprising of enterprise applications, internet applications and service and a special technology to enable companies to participate in the emerging online economy.

Technology is in abundance. The hardware and software makers are yet to work out strategies to ensure e-business privacy and security solutions to Net users in India. The technologists who are out of touch with the market, customers and competition need to work out options and set business strategies.

### **Cyber Competition**

It is becoming clearer that cyber structure is not enough to support cyber growth. Such a growth rate needs proper planning and world class global supply chain parameters. The profit strapped, not-struck cyber entrepreneurs have no vision and invest money on this.



One should not forget about low entry barriers, and as a result, cyber competition is perhaps more fierce. Cyber competition needs improvement in better contents, faster delivery of services and online support. It is a great task to pacifying angry live customers and then think how difficult it is to e-reassure a lost one. This means again more investment and more capitalization which is further from break-even.

### **Difficulty of Reengineering**

The web business structure will have to undergo a drastic change and be reengineered. It is not just about having a website or about sticking a web address on conventional advertising or transferring a few people to a new division and designation. It is about breaking free and creating new web services to satisfy the existing customers.

### **Internet for Small Business**

Another problem is that for major project, a large consumer product company needs profiling of customers who undertake transaction through e-commerce.

E-commerce is still being dominated by large corporations. Small and medium sized business houses have to take advantage of everything on the Net. Online shopping is clearly catching on with consumers and retailers need to keep pace with growing demands.

### **Blocking and Censorship**

People worldwide are under virtual slavery. It has been ISS reported in some media that many countries are blocking their citizens from accessing the Net, either partially or wholly. Censorship is enforced by some countries by stopping either a total ban on the Net or controlling the access traffic or installing filters blocking access to websites. Indian citizens enjoy unprecedented degree of freedom of speech and therefore may constitute a threat to the government. Development in any field may prove detrimental if it does not appreciate the code of ethics.

### **Infant Stages**

Electronic commerce is still in its infant stage. Indian commerce is establishing itself in the area of internet business. The concept of e-commerce is still in evolutionary stage, it is a job that still needs to be defined. The IT function has not grown beyond the marketing department and credit cards, merchant accounts, digital signatures and prompt payment and one has to realize that the e-commerce role is more about harnessing technological resources to deliver profits to the Net users. Only a few Indian big houses have gone online to explore the potentials of e-commerce.

E-commerce has yet to take off in India, because Indian consumers are wary of leaving their re credit card numbers on the Net. They eye the neighbourhood shopkeeper with suspicion and drive a hard bargain. So, e-commerce websites are losing thousands of customers.

#### **1.10 SUMMARY**

Thus, e-commerce is still commerce and still about human beings. Customers are still customers and merchants want people at their end. They send confidential, personal and financial information only by e-mail or can cash on the phone or might just prefer to visit in person. E-commerce is just only a new way of doing business or an additional method of doing business. It is a new generation technology, a new method of doing business with new generation technology. Still, there are many drawbacks which fail to benefit the users of technology to a great extent.

E-commerce is to be viewed as business but not as a technology issue. It must be business driven but not IT driven and initiatives must be integrated thoroughly into the existing commerce structure and strategy.

#### **1.11 KEYWORDS**

**E-Commerce:** Digitally enabled commercial transactions between and among organizations and individuals.

**EDI :** Electronic Data Interchange, means a way to exchange standard documents in intra or inter organizations.

**B2B :** Business to Business, means e-commerce transactions taking place between business to business organizations.

**B2C :** Business to Consumers, means e-commerce transactions taking place between business organizations and consumer directly.

**C2C :** Consumers to consumers e-commerce, means e-commerce transactions taking place between consumer to consumer.

**B2E :** Business to employees e-commerce, means e-commerce transactions taking place between business organizations to employees.

**C2B :** Consumer to business e-commerce, means e-commerce transactions taking place between consumer to business organizations.

**Cyber Law:** Cyber law is that law which is used to deal with all cyber crimes, i.e., crimes done on internet.

## **1.12 SELF ASSESSMENT QUESTIONS**

- 1 What is e-commerce? Discuss various characteristics of e-commerce.
- 2 Discuss various limitations of e-commerce.
- 3 “E-commerce is the new way to do business. Justify the statement.
- 4 What is scope of e-commerce in country like India?
- 5 Discuss various types of e-commerce models.
- 6 What is future of e-commerce in India?

## **1.13 REFERENCES / SUGGESTED READINGS**

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## **LESSON: 2**

### **FRAMEWORK OF E-COMMERCE**

**Subject: E-Commerce**

**Paper Code: MM-409/IB419**

**Author: Prof. Mukesh Dhunna**

**Vetter : Prof. Dharmender**

#### **STRUCTURE**

- 2.0 Objectives
- 2.1 Introduction
- 2.2 Information Providers
- 2.3 E-Commerce Functions
- 2.4 E-Commerce : A Generic Framework
- 2.5 E-commerce Building Blocks : Objects and Object Classes
- 2.6 E-Compatible Legal And Financial Framework : An Indian Approach
- 2.7 Summary
- 2.8 Keywords
- 2.9 Self Assessment Questions
- 2.10 Suggested Readings

#### **2.0 OBJECTIVE**

Electronic commerce, a new means of carrying out business transactions through electronic means in general, and through Internet environment in particularly, has been proving its potential benefits and effective contribution to the socio-economic growth. As an essential part of the “digital economy”, electronic commerce plays the role as the key for us to open our door to the 21<sup>st</sup> century, the new era of knowledge-based economy. In the context of electronic commerce, there is a need to define the framework of e-commerce.

After going through this lesson, you will be able to:

- Describe the framework of E-Commerce
- Illustrate different building blocks of E-Commerce
- Identify the various functions of E-Commerce
- Explain the Indian approach of legal and financial framework of E-Commerce

## **2.1 INTRODUCTION**

Electronic commerce is the ability to perform transactions involving the exchange of goods or services between two or more parties using electronic tools and techniques. Long employed by large businesses and financial service organizations, several factors are now converging to bring electronic commerce to a new level of utility and viability for small businesses and individuals -- thereby promising to make it part of everyday life. These enabling factors include improved broader competitive access to networks, and the reduced cost and increased user-friendliness of both general-purpose computers and specialized devices. The rapid growth of primarily the Internet and other on-line services, convenient point-of-sale payment systems, and automated teller machines all set the stage for broad-scale electronic commerce. Further, with relentless pressures of competition at all levels of the economy, the efficiencies offered by electronic commerce are becoming hard to ignore.

## **2.2 INFORMATION PROVIDERS**

Traditionally, in the physical world, we distinguish between three different types of information-driven companies: those that create content (e.g. TV production), those that define the form or format (e.g. recording studio) and finally those that provide the distribution medium (e.g. TV broadcasting station and cable operators). Companies that are targeting vertical markets need access in all three areas.

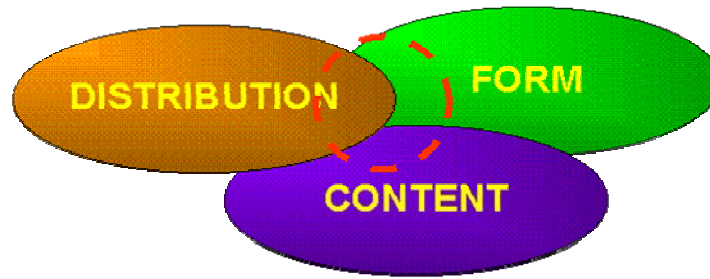


Fig 2.1: Types of Information Providers

### 2.3 E-COMMERCE FUNCTIONS

The following ten functions must be provided in order to EC to occur; in essence, they are the enablers of EC:

- Standards setting body
- WAN service provider
- Hosting service (i.e. data center)
- Software developer
- Certification authority
- Publisher/Aggregator (presence provider)
- Copyright broker
- Metering authority
- Auditing authority
- Information consumer

The provision of the above ten E-Commerce functions does not necessitate the involvement of an equivalent number of parties; many of these will be carried out by the same provider. For example, the Hosting Service can be the same organization as the Publisher/Aggregator.

### 2.4 ELECTRONIC COMMERCE: A GENERIC FRAMEWORK

As it has already been discussed in chapter one that E-commerce is related to execution of business transactions of electronic messaging devices, there have been a lot of changes

in the traditional business models to incorporate advantages offered by e-commerce. The old 'brick-and-mortar' businesses are finding ways to incorporate the activities to gain advantages from the avenues opened by e-commerce, while on the other hand there is a swarm of new entrepreneurs in race to establish themselves in the new digital marketplace. But like in real physical markets only those will survive who have a strong fundamental framework based on sound business and market understanding. As e-commerce is rather in its nascent stage and is evolving at a fast pace, the importance of developing business models on such sound frameworks is accentuated. Such a framework needs to encompass within itself the basic and supportive infrastructure and business applications as well as the basic issues that are needed to be kept in mind while developing the e-commerce business model. There are certain basic considerations that should be kept in mind while developing such a generic framework for e-commerce. These are as listed below.

### **1. Interoperability**

Electronic commerce must be based on a common set of services and standards that ensure interoperability. Preferably, service providers and application designers will be able to use these services and standards as building blocks that can be combined, enhanced, and customized.

### **2. Flexibility and Forward integration**

E-commerce as said above is still in its nascent stage and is constantly improving. And as it does so, new services and business application areas will emerge. It is thus very much logical that any generic framework developed for e-commerce shall be able to accommodate future enhancements and trends in the infrastructure, industry and applications.

### **3. Involving latest technological and applications**

As the technological and business logic develops in its natural flow during the evolution of e-commerce, the e-commerce framework should be able to incorporate those newer technologies and business logic. An example of such



possible business logic will be the payment systems that shall be developed along the path of development of the field. The generic framework of e-commerce should be able to acknowledge and accept such advancements, especially in the field of electronic payment systems.

#### **4. Backward Integration**

There will be many business enterprises that will shift from traditional commerce to electronic commerce. These traditional business enterprises are bound to be using their own "legacy systems." These include paper checks, mainframe-based settlement and payment systems, and EDI VANs. It is very much logical to expect that these legacy systems will not vanish overnight. A successful electronic commerce infrastructure must let the user transfer easily and transparently between these older systems and newer, all-electronic systems, applications, and processes.

#### **5. Media Convergence**

Electronic commerce transactions will involve all kinds of legacy and newly developed devices and media, and networks over which these are delivered. A generic framework developed for Electronic commerce must be able to take into its stride the ability to accommodate the plethora of technologies, devices and their convergence, needed to reach and sustain the mass market.

#### **6. Information-intensive products**

A particularly important class of products on the NII are those that are pure information. These products are actually enabled by information technology, not just distributed more efficiently by it. Information products include electronic publications, catalogs, videos, and the like, as well as interactive video games, software programs, electronic tokens, customized design specifications, and even electronic keys to hotel rooms, cars, storage compartments, and airport boarding gates. Many of these products will not be simply "offered" by a vendor; they will be designed or tailored by a customer. Customers can, for example, choose their

own selection of articles to be bound in an electronic book, or customize their own clothing designs. This capability adds a customer-driven activity - a design phase - to the purchase cycle. It is likely that for these products, ordering, billing, payment, and distribution would be tightly integrated and happens virtually simultaneously.

## **7. New revenue collection methods**

Electronic commerce will need to support advanced types of revenue collection in addition to traditional methods (e.g., payment upon receipt, payment in advance, etc.). For example, an information product service provider could distribute its product widely and charge on a usage basis; that is, charge the customer only when the information (be it a software program, digital document, or electronic key that opens and starts a rental car) is used. One innovative approach that permits usage accounting and payment is called meterware. It provides local hardware and/or software to record and bill customers continuously based on their product usage. Meterware, electronic cash and checks that don't need an online payment processor, and other advanced revenue collection ideas create opportunities for reaching new customers and for distributing products and services. These methods make a lot of sense in a low distribution cost environment supported by the electronic commerce infrastructure.

## **8. Legacy systems**

Many “legacy systems” exist in the electronic commerce domain. These include paper checks, mainframe-based settlement and payment systems, and EDI VANs. None of these legacy systems will go away overnight: A successful electronic commerce infrastructure must let the user transfer easily and transparently between these older systems and newer, all-electronic systems, applications, and processes.

## **9. Transaction devices**

Electronic commerce transactions will involve all kinds of legacy and newly developed devices and media, and networks over which these are delivered. Electronic commerce must accommodate the technologies and devices needed to reach and sustain the mass market.

A framework developed with all of these needs and considerations in mind will form the strongest basis for a powerful and useful electronic commerce infrastructure. We next describe the specific activities and functions this infrastructure must support.

### **Activities and Functions**

- advertising and shopping,
- negotiating,
- ordering,
- billing,
- payment and settlement,
- distribution and receipt,
- accounting,
- customer service, and
- information and knowledge processing.

The specific functions associated with these activities in an electronic commerce setting are discussed below. Note that not all of these activities are performed in every transaction, nor are they necessarily performed in this order; indeed, they may be performed in parallel. Also, all activities are not necessarily conducted electronically. Finally, these activities can vary in complexity and importance depending on the transaction's size and scope.

### **Advertising and Shopping**

This activity can include

- searching and browsing electronic directories and catalogs on a network;

- enabling intelligent agents for various purposes on behalf of one or many buyers and/or sellers;
- buyers sending electronic requests for proposal (RFPs) and sellers responding with various offers;
- sellers advertising their products and services; and
- electronically navigating network-accessible services.

A major problem associated with the advertising and shopping activity is the cost and time expended in developing, maintaining, and finding relevant information, products, and services, given the plenitude of available information. Obviously, this problem will become increasingly complex as more data and services become available online and the choices and possibilities multiply exponentially. We need better ways to find and offer services and products.

### **Negotiating**

Buyers and sellers may elect to negotiate the terms of a transaction -- that is, the terms of exchange and payment. These terms may cover delivery, refund policies, arranging for credit, installment payments, copyright or license agreements, usage rights, distribution rights, etc. These terms can be standardized for routine commodity use, or customized to suit more unique individual situations. Often, in the case of two parties with a well-established business relationship, the terms of exchange are pre-negotiated as standing contractual terms for all their future exchanges. This process will frequently also include authentication of the two parties.

### **Ordering**

The buyers eventually issue a contractual agreement of the terms of exchange and payment. This contractual agreement is generally issued as an order that sets forth the quantity, price, and other terms of the transaction. The order may be verbal, in writing, or electronic. It usually includes an acknowledgment of agreement by the various parties to help prevent any future repudiation. This agreement can be confirmed in a secure way, electronically safeguarded by cryptographic techniques such as digital signatures.

In the case of some commodity purchases, the entire transaction may begin at this ordering stage, bypassing the advertising/shopping and negotiating activities. The ordering activity applies to all transactions, regardless of whether billing will be involved. Even requests for free public information should be issued as formal orders so that the service provider can record and account for information requests.

### **Billing**

Once a seller has delivered goods or services, a bill is sent to the buyer. This bill generally includes remittance information that should accompany the payment. Sometimes, a seller may require payment in advance. Sometimes, a supplier sends advance shipping notification, and the customer agrees to authorize payment upon confirmation of the arrival of the products. And in some cases, as with the free information example cited above, this activity is eliminated entirely.

### **Payment and Settlement**

The buyer, or some financial intermediary, eventually sends some form of electronic payment (this could be some form of contract or obligation, such as authenticated payment instructions or digital cash), usually along with some remittance information to the seller. This payment may be sent for a single item, on a usage basis, or for multiple items or usage. Settlement occurs when the payment and remittance information are analyzed by the seller or the seller's agent and accepted as valid.

### **Distribution and Receipt**

Either before, after, or concurrent with payment, the seller arranges for delivery of the purchased goods or services to the buyer; and the buyer provides the seller with proof of receipt of delivery. Policies regarding customer satisfaction and return should be negotiated prior to this activity and made part of the contract between buyer and seller. For larger, more complex orders, distribution may involve more than two parties and entail complicated distribution coordination strategies. An ancillary distribution service involves acting as a fiduciary and holding goods, certificates, bonds, stocks, etc., in trust.

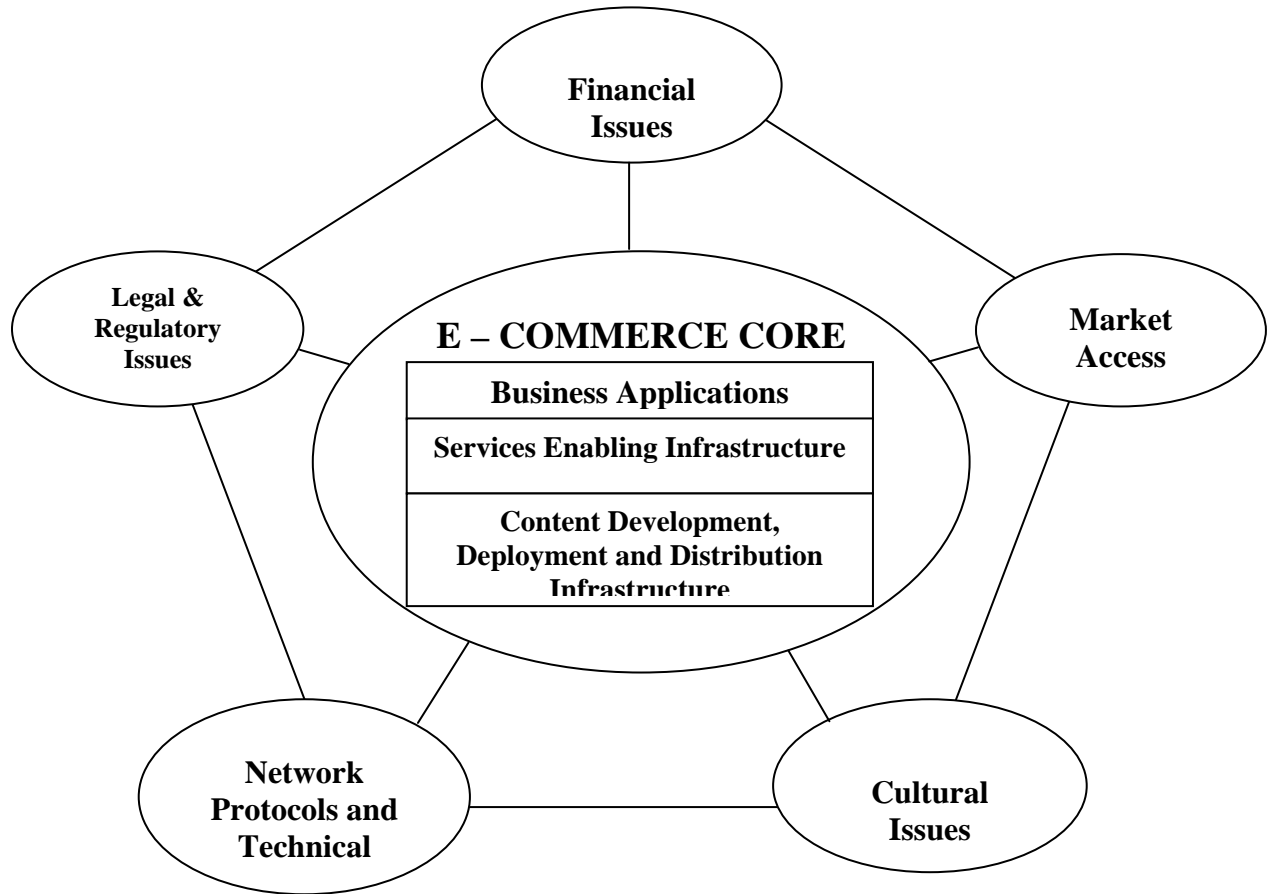
## **Accounting**

This activity is particularly important to corporate customers and suppliers. Both buyer and seller must reconcile all electronic transactions in the accounts receivable and accounts payable, inventory information, and accounting systems. Account and management information system records must also be updated. This activity can involve third parties if the transacting businesses outsource their accounting services.

## **Customer Service**

- Customer service entails :
- providing the buyer with timely information as to the progress of the transaction;
- handling customer requirements when transactions go awry - i.e., resolving any mistakes, disputes, or complaints concerning product quality, delivery, or payment (this includes managing returns and refunds, further exchanges, and/or repairs); and
- providing expert advice and assistance in the use of the products and services.

Customer service concerns may also include providing general cash management advice, including addressing foreign exchange imbalances and risk exposures; collecting delinquent payments and late fees; and repossessing products for which payment is long. A framework developed with all of these needs and considerations in mind will form the strongest basis for a powerful and useful electronic commerce infrastructure.



**Figure 2.2: Framework of E-Commerce**

A generic e-commerce framework can be explained in two basic parts;

1. The E-Commerce core consisting of basic infrastructure which will enable the e-commerce activities, and
2. A five-corner web of basic issues that will ultimately shape all e-commerce efforts.

### **THE E-COMMERCE CORE**

Following a bottom-up approach, e-commerce core can be described as a three-layer hierarchical architecture where each subsequent layer is based upon the lower layers. The three layers, starting from the lowest layer are:

## **Content Development Deployment and Distribution Infrastructure**

This layer will include all hardware and network infrastructure that will act as physical infrastructure to enable e-commerce transactions. This will include:

### **Content Development Infrastructure**

- Multimedia Publishing Infrastructure (to create multimedia contents for business applications)
- Multimedia Storage Infrastructure (to provide for efficient and organized storage facilities for efficient and quick retrieval and deployment of multimedia contents)
- Multimedia Deployment Infrastructure (to search and retrieve multimedia contents from their storage locations)

### **Distribution Infrastructure**

- Network Access Device Infrastructure (independent and internally controlled by merchants and consumers)
- Infrastructure installed by Network Service Providers (includes Local-on-ramp service providers, National Data and Information Carriers, Third-party Value Added Networks and other Network Service Providers)
- Global Information Delivery Networks (includes sub-marine cables, Intercontinental optic fiber networks, satellite networks and other such networks forming backbone of global communication networks)

### **Services Enabling Infrastructure**

This layer will include all vendors and other parties engaged in the business activities which facilitate e-commerce transactions in any fashion. The list of such business activities may include following:

1. Securing Business Transactions by providing hardware and software solutions to counter both physical and logical security threats (this includes development of encryption technology and standards, development of standards and technology for restricting physical access to the e-commerce equipments).



2. Development of secure Electronic Payments Fund Transfer systems
3. Third-party verification and authentication services
4. Developing standards and formats for content creation, distribution and deployment (this includes development of multimedia formats, conversion software, software development kits, development of standards and protocols for data transmission, and other such infrastructure)
5. Development and deployment of technologies enabling convergence of different media (this includes convergence of content, transmission technologies and information access devices).
6. Offline Support Services provided by traditional 'brick-and-mortar' support service providers (this includes services like distribution and logistics etc)

## **2.5 ELECTRONIC COMMERCE BUILDING BLOCKS: OBJECTS AND OBJECT CLASSES**

The activities and functions of electronic commerce need certain basic building blocks, namely,

- unstructured information (reports and freeform text, voice, and video);
- structured information (EDI messages, electronic forms, contracts and contact rules, design specifications);
- accounts, account databases, and accounting rules;
- transactions;
- records;
- agents and brokers (information filters, translators, trusted third parties);
- objects for sale (movies/videos, software objects, contracts, information, documents); and
- decision support models and simulations.

These building blocks are likely to become the standard digital objects of commerce; over time, they will probably become increasingly comprehensive and refined

## **BUSINESS APPLICATIONS**

This layer corresponds to the real business transactions that take place using the digital messaging technologies. A few of the common business applications that can be offered online can be listed as below:

- Online Education and Learning (Education-on-Demand, Distance e-Learning, Virtual Classrooms, CBT, etc.)
- Online Marketing Communication and Promotion
- Online Shopping
- E-procurement and e-purchasing
- Online Gaming
- Online news and bulletin boards.
- Online Customer Feedback and Satisfaction Surveys
- Online Research
- Online Retailing and Sales
- Online After Sales and Complaint Redressal
- E-Auctions
- Online Stock Trading and Brokering
- Online Entertainment
- Digital Video and Animation
- Online Banking Services (including ATM networks)
- E-Publishing
- Supply Chain Management
- Online Catalogues and Directories
- Remote Inventory Management
- Online knowledge and information processing

## **ISSUES INVOLVED IN E-COMMERCE**

### **Financial Issues**

- Customs and Taxation
- Electronic Payments and Fund Transfers

### **Legal and Regulatory Issues**

- Uniform Commercial Code
- Intellectual Property Protection
- Privacy
- Security, Confidentiality and Integrity
- Protection of Consumer Rights and Interests
- Content Liability
- Dispute Resolution and Jurisdiction

### **Market Related Issues**

- Market Development Stage
- Competition
- Customer Orientation
- Trust and Reliability

### **Network Protocols and Technical Standards**

- Transmission Protocols and Standards
- Multimedia Formats
- Hardware Standards
- Interoperability
- Backward and Forward Integration of Hardware and Software
- Documentation Specifications
- Compatibility
- Acceptability of Standards

### **Socio-cultural Issues**

- Perceived Economic Appeal
- Attitude towards e-commerce
- Usability (will define the default navigation patterns)
- Lifestyle
- Demographics of Target Market
- Purchase potential
- Social and Religious Dynamics

## **2.6 E-COMPATIBLE LEGAL AND FINANCIAL FRAMEWORK: AN INDIAN APPROACH**

All over the world, globalization and the new information and communication technologies that are restructuring the commercial distribution circuits are reinforcing the linkages between internal and external trade. Even developing countries like India, therefore, can no more treat the internal and external sectors in isolation. The legal and financial framework for one sector directly affects the other sector. While the regulations and rules which govern commercial operations remain mostly local or national in scope, the growth of e-commerce will increasingly call into question the ability of public authorities to impose their prerogatives on national markets and international trade by their companies and citizens.

### **Legal framework**

Legal issues encompass two basic areas—those of regulation, and those of making legal systems compatible to and for e-commerce. The latter, though perceived as being facilitator in content, requires the former for it to be effectual. There are in fact many things that governments might reasonably want to regulate on the Internet. These include not just serious affronts to human values such as child pornography and incitement to racial hatred, but also consumer protection, the defence of intellectual property rights, and taxation. These are all issues on which countries legislate already. The existing rules and laws would and should apply to the Internet and e-commerce. The problem is not whether the Internet should be regulated, but how. This entirely new sort of communication poses several entirely new sorts of problem for regulators. A legal framework for e-commerce has been provided by the Information Technology Act, 2001, making India only the twelfth country worldwide which has such a comprehensive legislation for e-commerce in place. This Act also effects consequential amendments in the Indian Penal Code, the Indian Evidence Act, 1872, and the RBI Act, 1934 to bring them in line with the requirements of digital transactions. (Similar amendments are being planned for the Companies Act, 1956 to also facilitate e-commerce and e-governance.)

The IT Act essentially seeks to address three areas or perceived requirements for the digital era:

- a. to make possible e-commerce transactions—both business to business and business to consumer
- b. to make possible e-governance transactions—both government to citizen and citizen to government
- c. to curb cyber crime and regulate the Internet.

Rules under the IT Act have been formulated and a national controller for enforcing the Act appointed. This controller will regulate the certifying authorities that will issue the digital signatures and the systems for authentication. These steps need to be matched by sorting out the issues of security and payments. Security and authentication arrangements need to be recognized and accepted globally. On the first, though governments (such as the US government) have taken several steps, countries like India are yet to develop reliable technologies. (US companies developing them are presently restricted by their Government from the export of such technologies and that is an issue that needs to be addressed at the international level.)

Security and control provisions in the IT Act, especially those relating to cyber-crime, have been criticised by the media and free-speech advocates. After all, the right of freedom of speech and the right to information are fundamental to democracy and attempts to control IT and e-commerce must not seem to be attempts to curb the growth of the Internet (as some countries in the Middle East and China are attempting to do). The broad and sweeping powers given to the Police (without a warrant or judicial overview) have been criticised by several experts as well as by NASSCOM. The Government needs to be extremely careful in this area as attempts at controlling pornography should not be seen as, or result in, creating hindrances to the growth of the Internet in India.

With the advent of new security mechanisms such as electronic/digital signatures, certificates, etc., the future of electronic commerce rests on confidentiality. Another facet

of security is privacy, which is closely related to data collection, interpretation, dissemination, and circulation. Standards are required to govern the way in which personal information is acquired, disclosed, and used on-line. One of the criticisms levelled against the IT Act is that it does not have any clause ensuring security and protection of the on-line consumer. Legal opinion is divided on this point, with some experts arguing that the existing Consumer Protection Act, 1986 is quite comprehensive and can be extended to cover on-line consumers also, as, after all, on-line shopping is just another way of transacting business. However, even if this be the case there are several aspects peculiar to digital transactions such as electronic payments, confidentiality, transaction data, etc. that lead to problems arising in cyberspace.

An international consensus on privacy protection is developing around the OECD guidelines on the protection of privacy and trans-border flows of personal data, which embodies well-established principles of fair information practices. These guidelines could form the basis of establishing privacy and confidentiality in the Indian e-commerce environment. Much of the IT Act as promulgated, deals with citizen interaction with government. Certainly a proper and far-reaching mission towards e-governance. But there are several hurdles before this becomes a reality. The main being that government departments not only lack the hardware for electronic transactions but will also need to reorient their systems and procedures before they are ready to interact through electronic documents.

### **E-Governance**

E-governance implies action and commitment of the state and its agencies at two levels:

- a. It involves the promotion of the information and communication technologies and, especially, e-commerce, on the one hand, and
- b. The adopting of these technologies and all they involve in the matter of a completely new type of commitment, open systems and use of the medium of the Internet for government business, citizen interaction, and most important, for development.

Fortunately today several e-governance projects are underway in several states of India. The introduction of e-governance could turn out to be one of the most far-reaching and progressive steps in India. Not only does it signal a commitment of government to the use and introduction of IT for efficiencies in government services and citizen interface but it could also be the most potent weapon against the emerging and growing digital divide.

**Some of the challenges in this regard are:**

- Handling the feudal mindset—information is seen as power and those having it do not wish to give it up.
- Implementation requires change management and re-engineering of government agencies, and not so much of technology.
- Transparency, i.e. the issue of making government dealings (including procurement) transparent and thereby reducing corruption.
- Labour and Union problems in government (as these are perceived to be a threat to established procedures and vested interests).

Implementation of e-governance is quite obviously not going to be very easy or smooth. There is still a great deal of confusion among implementing agencies at various levels as to what exactly e-commerce and e-governance are and how to go about it. Part of the problem is that some of these organisations have inadequate internal computer personnel who have their own limitations in understanding and implementing e-governance schemes or in serving as a bridge between the organisation and professional external organisations. There is also the need for integration and convergence of services offered by different departments so that a truly single point service can evolve. Extensive coverage of rural areas is also going to take time.

Despite these constraints, the initiatives here are crucial. By using the Internet as a tool for 'electronic governance', the environment for e-commerce development itself would be furthered and strengthened. The premise here is that in promoting business on-line,

governments will facilitate the delivery of information, goods, and services. This will then deliver more traffic across data networks, which, in turn, will serve to provide the revenues and investment rationale needed to encourage further infrastructure development.

### **Financial framework**

One of the main concerns of developing countries are the perceived dangers foreign exchange outflow on account of e-commerce, i.e. through the purchase of goods abroad. In order, therefore, to encourage e-commerce development, banking procedures within developing countries need to be aligned and made compatible with digital trade transactions, so that consumers and buyers can easily make purchases locally through the Internet.

Along with changes in contract and company law, e-commerce would also require a financial and banking framework that allows for electronic payments and transfers. This would include requirements for certification of documents, electronic signatures, confidentiality, and privacy. Therefore, India needs to put in place both the electronic network (between financial institutions) as well as the regulatory framework to allow for such transactions. Banking regulations (and rules as a result of the changes in the RBI Act) thus need to be adjusted to the new formats and requirements. The IT Act thus needs matching implementation at the fiscal regulatory level. Payment gateways for e-commerce transactions are one of the most essential requirements for establishing and developing e-commerce. These need to be well established and strengthened in India. Today some of the banking institutions are offering this service with international collaboration, but for this to truly make a mark, electronic fund transfers and a credit card culture must evolve and set in India.

## **2.7 SUMMARY**

The e-commerce framework and information infrastructure, still in the early stages of its development, is already transforming our world. Over the next decade, advances on the EC framework will affect almost every aspect of daily life -- education, health care, work



and leisure activities. Disparate populations, once separated by distance and time, will experience these changes as part of a global community.

No single force embodies our electronic transformation more than the evolving medium known as the internet. Once a tool reserved for scientific and academic exchange, the internet has emerged as an appliance of every day life, accessible from almost every point on the planet. Students across the world are discovering vast treasure troves of data via the www. Doctors are utilizing tele-medicine to administer off-site diagnoses to patients in need. Citizens of many nations are finding additional outlets for personal and political expression. The internet is being used to reinvent government and reshape our lives and our communities in the process.

As the internet empowers citizens and democratizes societies, it is also changing classic business and economic paradigms. New models of commercial interaction are developing as businesses and consumers participate in the electronic marketplace and reap the resultant benefits. Entrepreneurs are able to start new businesses more easily, with smaller up-front investment requirements, by accessing the Internet's worldwide network of customers.

An increasing share of these transactions occurs online. The EC framework has the potential to revolutionize commerce in these and other areas by dramatically lowering transaction costs and facilitating new types of commercial transactions.

The e-commerce will also revolutionize retail and direct marketing. Consumers will be able to shop in their homes for a wide variety of products from manufacturers and retailers all over the world. They will be able to view these products on their computers or televisions, access information about the products, visualize the way the products may fit together (constructing a room of furniture on their screen, for example), and order and pay for their choice, all from their living rooms.

Commerce on the internet could total tens of billions of dollars by the turn of the century. For this potential to be realized fully, governments must adopt a non-regulatory, market-oriented approach to electronic commerce, one that facilitates the emergence of a transparent and predictable legal environment to support global business and commerce. Official decision makers must respect the unique nature of the medium and recognize that widespread competition and increased consumer choice should be the defining features of the new digital marketplace.

Many businesses and consumers are still wary of conducting extensive business over the Internet because of the lack of a predictable legal environment governing transactions. This is particularly true for international commercial activity where concerns about enforcement of contracts, liability, intellectual property protection, privacy, security and other matters have caused businesses and consumers to be cautious.

As use of the internet expands, many companies and internet users are concerned that some governments will impose extensive regulations on the internet and electronic commerce. Potential areas of problematic regulation include taxes and duties, restrictions on the type of information transmitted, control over standards development, licensing requirements and rate regulation of service providers. Indeed, signs of these types of commerce-inhibiting actions already are appearing in many nations. Preempting these harmful actions before they take root is a strong motivation for the strategy outlined in this chapter.

## **2.8 KEYWORDS**

**Interoperable:** It means the system can work on different hardware and software platforms

**WAN:** Wide area network, a type of network spread through the world

**VAN:** Value added network, a privately owned network providing various value added services

**Protocol:** Set of rules and regulations for communication and transfer of data between two computers in network.

**Meterware:** It is software which permits usage accounting and payment is called meterware.

**Legacy System:** These type of systems include paper checks, mainframe-based settlement and payment systems, and electronic data interchange in e-commerce

## **2.9 SELF ASSESSMENT QUESTIONS**

1. Define E-commerce framework.
2. Discuss various building blocks of E-commerce framework.
3. “E-Commerce framework lies on different pillars.” Justify the statement
4. Discuss various applications of E-commerce with regard to consumer, business and organizations.
5. Highlight the major provisions of IT Act with respect to e-governance and e-commerce in India.
6. Elaborate various issues to be considered most important while describing the framework of e-commerce.
7. “Change is the nature of law.” How this statement is being used in business in this changing environment.

## **2.10 SUGGESTED READINGS**

- Kalakota, Ravi and Whinston, Andrew B. “Electronic Commerce – A Manager’s Guide”, Pearson Education, Inc.
- Kalakota, Ravi and Whinston, Andrew B. “Frontiers of Electronic Commerce”, Pearson Education, Inc.
- Rich, Jason R. “Starting an E-Commerce Business”. IDG Books, Delhi, 2000.
- Samantha Shurety. “E-business with Net Commerce”, Addison Wesley, Singapore, 2001.
- Turban et al. “Electronic Commerce: A Managerial Perspective”, Pearson Education, Inc.

## **LESSON: 3**

### **INTERNET SERVICE PROVIDER**

**Subject: E-Commerce**

**Paper Code: MM-409/IB-419**

**Author: Dr. Anil Khurana**

**Vetter :**

#### **STRUCTURE**

- 3.0 Objective
- 3.1 Introduction
- 3.2 Definition of Internet
- 3.3 Basic Concept of Internet
- 3.4 Requirements for Internet
- 3.5 Internet Service Provider
- 3.6 Types of Internet Service Provider
- 3.7 Types of ISP Accounts
- 3.8 Selection of Internet Service Provider
- 3.9 ISP in India
- 3.10 Summary
- 3.11 Keywords
- 3.12 Self Assessment Questions
- 3.13 Suggested Readings

#### **3.0 OBJECTIVE**

After going through lesson, you will be able to:

- Describe the concept of Internet
- Identify the requirement of Internet
- Illustrate the different types of ISP
- Evaluate the factors for ISP selection
- Describe different types of Internet Account

### **3.1 INTRODUCTION**

The Internet has revolutionized the computer and communications world like nothing before. The invention of the telegraph, telephone, radio, and computer set the stage for this unprecedented integration of capabilities. The Internet is at once a world-wide broadcasting capability, a mechanism for information dissemination, and a medium for collaboration and interaction between individuals through computers irrespective of geographic locations.

### **3.2 DEFINITION OF INTERNET**

The Internet is a global network of computers that allows people to send email, view web sites, download files such as mp3 and images, chat, post messages on newsgroups and forums and much more. The Internet was created by the Advanced Research Projects Agency (ARPA) of the U.S. government in 1960's and was first known as the ARPANet. At this stage the Internet's first computers were at academic and government institutions and were mainly used for accessing files and to send emails. From 1983 onwards the Internet as we know it today started to form with the introduction of the communication protocol TCP/IP to ARPANet. Since 1983 the Internet has accommodated a lot of changes and continues to keep developing. The last two decades has seen the Internet accommodate such things as network LANs and ATM and frame switched services. The Internet continues to evolve with it becoming available on mobile phones and pagers and possibly on televisions in the future.

The actual term “Internet” was finally defined in 1995 by FNC (The Federal Networking Council). According to Federal Networking Council (FNC) Internet refers to the global information system that,

- is logically linked together by a globally unique address space based on the Internet Protocol (IP) or its subsequent extensions/follow-ons.
- is able to support communications using the Transmission Control Protocol/Internet Protocol (TCP/IP) suite or its subsequent extensions/follow-ons, and/or other IP-compatible protocols.

- provides, uses or makes accessible, either publicly or privately, high level services layered on the communications and related infrastructure described herein.

### 3.3 BASIC CONCEPT OF INTERNET

#### Who Runs The Internet?

Who controls this web, this cloud, this network of networks? Well, no one, really. The Internet seems to be both institutional and anti-institutional at the same time, massive and intimate, organized and chaotic. In a sense the Internet is an international cooperative endeavor, with its member networks kicking in money, hardware, maintenance, and technical expertise.

The U.S. government has had a big influence on the federally funded parts of the Internet. The National Science Foundation (NSF) initiated the NSFNET in the mid 1980s, a nationwide backbone in the United States that connected many mid-level networks, which in turn connected universities and other organizations. At the time of this writing, the NSFNET production backbone is being phased out and connectivity will be offered by other providers, including commercial networks, in the near future. But you may still hear people refer to the NSF and its influence on the Internet. The NSF funds an experimental high-speed network and will continue to provide funding for a short time to assist universities and schools in getting Internet connections.

#### Names and Addresses

If you've ever traveled in a country where you couldn't read the street signs or figure out how they numbered the houses, you'll understand the wisdom of learning the Internet's name and address system. Most computers on the Internet can be identified in two ways. Each computer, or **host**, has a name and a numerical address (both unique), just as most of us can be located by our names or numerically by our phone numbers. It's easier to remember a name than a phone number, and it's the same on the Internet. An Internet computer name is usually several words separated by periods, such as yahoo.com. An Internet address—technically an **IP address**—is four numbers also separated by periods, for example, 161.44.128.70.

When you're saying these names and addresses out loud, you should substitute "dot" for "period" to sound as though you belong.

The idea is for people to use the computers' names when accessing resources, and to let the computers and routers work with the IP addresses. Each Internet-connected organization keeps a database of the names and addresses of all the computers connected to its own networks. Because there are so many computers on the Internet and there is no real central authority, name assignment is best left to the local networks.

**Domain Name System.** There's actually a method to these names and addresses—a naming system known as the Domain Name System, or DNS. The DNS is also the worldwide system of distributed databases of names and addresses. These databases provide the "translation" from names to numbers and vice versa, a sort of international *Who's Who* of computers. DNS names are constructed in a hierarchical naming fashion, which you can think of as a worldwide organization chart. At the top of this chart are top-level specifications, such as EDU (educational), COM (commercial), GOV (government), MIL (military), ORG (organizations), and NET (networks), and also two-letter country codes, such as US for the United States and CH for Switzerland.

An organization can register for a **domain name**, selecting one of the top-level specifications mentioned above that describes it best, and then preceding it with a recognizable version of its name. For example, the ABC Software Systems company will have a domain name like *abc.com*. From there, it can divide itself into subdomains, extending the organization chart to department levels, or it can just give all of its computers names in the *abc.com* domain.

Once you understand how this naming system works, you can remember names more easily, and you can also tell things about a computer, such as to what organization it belongs. The names do not, however, always indicate geographical location.

Many U.S. organizations and companies use the three-letter designations mentioned above (for example, EDU, COM, and ORG). However, most countries have stipulated that organizations use their two-letter country codes for top-level domains. For example, an actual computer name, *quake.think.com*, refers to a commercial (COM) enterprise: the computer's name is *quake* and it belongs to Thinking Machines Corporation (*think*), a supercomputer manufacturer in the United States. Another example is *fujitsu.co.jp*, a computer at the Fujitsu Company in Japan (*jp* is the two-letter country code for Japan).

### **Advantages of internet**

There many advantages to using the internet such as:

#### ***E-mail***

Email is now an essential communication tool in business. It is also excellent for keeping in touch with family and friends. The advantage to email is that it is free ( no charge per use) when compared to telephone, fax and postal services.

#### ***Information***

There is a huge amount of information available on the internet for just about every subject known to man, ranging from government law and services, trade fairs and conferences, market information, new ideas and technical support.

#### ***Services***

Many services are now provided on the internet such as online banking, job seeking and applications, and hotel reservations. Often these services are not available off-line or cost more.

#### ***Buy or sell products.***

The internet is a very effective way to buy and sell products all over the world.



### ***Communities***

Communities of all types have sprung up on the internet. Its a great way to meet up with people of similar interest and discuss common issues.

### ***A Leading-Edge Image***

Presenting your company or organization as leading-edge shows your customers and prospective customers that you are financially strong, technologically savvy, and ready for the 21st century. And that you care enough about your customers to take advantage of new technologies for their benefit. And finally that you have the resources to support your clients in the most beneficial manner possible.

More and more advertisers on television, radio, magazines, and newspapers are including a Web address. Now is the time to avoid playing catch-up later.

### ***Improved Customer Service***

The companies are available to their customers 24 hours a day, 7 days a week. The Internet never sleeps. Whenever customer needs information about any company, products or services, they can access the company's Web Page.

### ***Market Expansion***

The Internet is a global system. Latest estimates are that there are about 40 million people with access to the Internet, and this number is growing every day. By simply posting a Web Page you are also addressing International markets.

### ***Low Cost Marketing***

Imagine developing a full color brochure without having to incur the costs of proofs, printers, wasted paper, long lead times between revisions, and more. Then imagine a full color product or services brochure that is interactive and which incorporates text, graphics, audio, and/or video. One that can be immediately updated without incurring the usual costs of product material updates.

For a minimal initial investment your company or organization is presented to millions of Internet users worldwide. It's like a virtual brochure in everyone's hand without the associated costs.

### ***Low Cost Selling***

Without the cost of direct selling potential customers can get detailed information about your products or services at any time. And they can easily order your products over the Internet, or request additional information be sent to them via a request form on your Web page.

### ***Lower Communication Costs***

Your time, and your employees time, is valuable. Most businesses and organizations spend time answering the same questions over and over again. With a Web page you can make the answers available to everyone immediately. You can also update your Web page with new information quickly and easily.

### ***Value Added Marketing***

You can use your Web page to provide useful information about your particular industry, product or uses. Any type of information that you believe will be valuable to your customer base can be included in your web page to encourage visitors to your site. You can also provide easy links to other sites with information that would be of value to your customers.

## **3.4 REQUIREMENTS FOR INTERNET**

The basic requirements for connecting the computer system to the internet can be classified into two categories:

- Hardware Requirement
- Software Requirement

### ***Hardware Requirements***

Users can use any of the PC models coming today e.g. Intel Celeron, Intel P-I, Intel P-II , Intel P-III, Intel P-IV, AMD K6, CYRIX MII, etc. The CPU of 350 MHz and above gives a good performance.

Your computer should have atleast of 16 MB RAM to have good navigation on the net. The AGP card should have at least 4 MB RAM. This helps in watching the graphics/movies on the Internet effectively.

One should have a telephone line or ISDN (Integrated Services Digital Network) connection. ISDN connection has more bandwidth as compared to a single telephone line. A modem is also required. Modem stands for modulator / demodulator. The computer operates on digital signals, whereas the telephone lines operate on analog signals. So an additional piece of hardware, i.e., modem is connected between the computer and the telephone line. Modem converts the digital signals to analog and vice versa. Modems are inbuilt or they can be connected externally. The good modems available in the market are from the companies US ROBOTICS, D-Link etc. A modem can be an ordinary modem or a fax/voice modem. The fax/voice modem in addition to data, can also carry, voice on the net.

### ***Software Requirements***

We should have connecting software and web browser software. Internet can be called upon from any operating system e.g. Windows 98, Windows NT, Linux, Unix, etc. The two most widely used web browsers are Internet explorer and Netscape communicator.

After having the basic requirements the additional requirements that are required for smooth and quality service of internet, the following software are required:

- Anti-Virus
- Anti-Worm
- Firewall
- System Utilities
- Download Accelerator or Getright like software

- Compression and Uncompressing utilities
- Adobe Acrobat Reader
- Macromedia Flash
- E-mail configuring software like MS Outlook
- Web Messenger etc.

### **3.5 INTERNET SERVICE PROVIDER**

An ISP (Internet Service Provider) is a company which provides internet access to other companies or individuals. An ISP maintains connections to other networks and ISPs, acting as a router for internet traffic between a customer's computer and any other machine also connected to the internet anywhere else in the world.

### **3.6 TYPES OF INTERNET SERVICE PROVIDER**

Internet Service Provider is a company that you dial up to get on the Internet. There are basically four different kinds:

- National Companies That Offer Services through out the country.
  - Providers:
    - BSNL
  - Pros:
    - If you travel or move, most likely you will be able to access the Internet at your new location.
    - The extra services like chat rooms can be an added bonus.
  - Cons:
    - Technical support may be hard to reach or long distance.
    - Sometimes you get busy signals when trying to access them.
    - If you don't use the services, if there is an additional charge, it is a waste of money.
    - Although you buy an unlimited account, some will send you notices if you have been online too much.
- Specialized Companies That Offer A Service Like Filtering
  - Providers:

- Reliance
  - Airtel
  - Dishnet DSL
  - Satyam Infoways
  - HCL Infinet
- Pros:
  - You don't have to install additional software to get pornography out of your computer.
  - You will not have to update your filtering software.
- Cons:
  - In some cases roaming facility of account is not available.
  - Technical support may be limited.
- **Local ISPs (Small companies that offer Internet service to a small area)**
  - Providers:
    - Check in your telephone directory or yellow pages under Internet Services.
  - Pros:
    - Less error prone
    - Less disconnections
    - Offers a local dial up number if you are in a rural area that doesn't have local dial up numbers for the major providers.
  - Cons:
    - They may be limited in their equipment to offer a good, fast internet speed.
    - They may be limited in offering any web guidance.
- **Free ISPs**
  - Providers:
    - Call Tiger

- Pros:
  - Free and no commitment
  - Cons:
    - Technical support may be limited, long distance, or not available.
    - May not offer reliable service.
    - Advertising banner can take up a lot of space on your screen.
    - Some charge very high set up fees (stay away from these)

### **3.7 TYPES OF INTERNET SERVICE PROVIDER ACCOUNTS**

There are many types of connections USER can get on the internet depending on the type of use and the amount of resources (money) available. The different types of connections, their advantages and limitations have been discussed below:

No matter what type of connection you go in for, it should be reliable, fast, easily available, and economical. There is no such thing as a free connection to the Internet. Someone, somewhere has to pay for the equipment, software, telephone lines, and electricity.

Basically there are four types of connections to the Internet:

1. Dial-up Connection
2. ISDN Connection
3. Leased Line Connection
4. Cable Modem
5. DSL
6. Broadband
7. V-SAT

The most popular type of connection for an individual is the broadband connection as it is easily available and economical.

#### **1. Dial-Up Connection**

As the name suggests, dial-up link means you have to dial into a modem over a telephone line before you can get connected to the internet. A modem (modulator demodulator) is a device which converts digital signals emitting from the computer into analog signals so that the data is easily transmitted over analog telephone lines. At the receiving end, there is another modem which converts these transmitted analog signals back to the digital form which are received by the target computer.

For this type of connection you require:

A computer whose configuration could be 80486 but the best is Pentium-IV or above. Communication software, like dialer which the Internet connection provider will give and a telephone line.

A modem (optimal speed is 36.6 Kbps). These days we use modems of speeds up to 56 Kbps. Software like a browser, e-mail programme, FTP software, Newsgroup reader, Eudora, Outlook Express, etc. Outlook Express is one of the software which helps to read news and mail offline once they have been collected online.

There are 3 major ways by which you can get linked to the Internet using a dial-up connection, namely;

- A. Host terminal connection
- B. Individual computer
- C. Dial-Up or on demand through the LAN.

**A. Host Terminal Connection (Terminal Emulation)**

In case of host terminal connection, a PC is connected to some Internet host via modem and a terminal emulation programme is run. Your terminal now acts like a vt-100 terminal . In other words, you are connected to a large computer which is connected to the Internet. Thus if want to download a file, the file is downloaded to the host and not your computer. To download a file from their host to your computer you need to have

some specific software. In this type of connection you can download only text but not graphics. Hence, a host terminal connection is also referred to as a shell account. This account is best suitable for :

1. Students whose budget is low and their requirement is limited to text.
2. Users who connect via Telnet programmes.
3. Users whose frequency to use the Internet is low.
4. Users who want to use the Internet to access the network of their workplace from their home place (personal account). Such users could connect via Telnet.
5. Jobs where multi-tasking is not required. This connection permits only one task at a time, e.g., the user cannot read the news as well as download a file.

This type of a connection offers three different types of accounts depending on your distance from the ISP and the nature of work for which you want the connection.

1. Local dial.
  2. Use of public data networks.
  3. Restricted access.
- 
1. Local Dial: Local dial is the cheapest type and is only possible if the host is at a local telephone call distance away.
  2. Public Data Network: If the host is not in the vicinity, then long distance calls have to be made over public data networks. If the speed of such networks is slow then data transmission speed will also be slow and so the connection will prove to be more expensive.
  3. Restricted Access Account: Suppose you want to access only E-mail or newsgroups. In such situations, restricted access account is best for you. There are certain sites which provide inexpensive E-mail accounts, local bulletin board services, etc. you just have to registered pay only for the services you want to use.



## **B. Individual Computer**

Here your computer can work as an Internet Host, i.e., direct downloading of files and mails can be done when connected to the internet. This kind of link is a little more costly than the host terminal connection as you have to pay a monthly fees to the service provider or sometimes even a flat charge for a fixed period of time. Here you can have one or both the following account ;

1. Serial Line Internet Protocol (SLIP)
2. Point to Point Protocol (PPP)

1. Serial Line Internet Protocol (SLIP) . In case of SLIP data is sent in packets under speeds of 9600 bps on telephone lines using data compression protocols.
2. Point-to-Point Protocol (PPP). In case of PPP data is sent over telephone lines via modem. Double checking is done at the destination to see if data packets have arrived intact. This is better than SLIP as it allows authentication of users. These days PPP connections are more common. Again, speed of data transfer in PPP is faster than in SLIP.

This type of connection is good for people who:

1. Use Graphics.
2. Download files often.
3. Use direct e-mail or any other online service.
4. Use Internet regularly though for limited hours.

The limitations are few, such as , people may not be able to access the Internet easily if the disk space is limited or if the line is slow (i.e., speeds below 28.8 Kbps will not be accessible by other people).

## **C. Dial-Up or On-Demand through the LAN**

In this case there is a dial up link from the LAN to which you are connected to. This type of connection is favourable for small business houses and educational institutes. Here the server, on demand, dials up for a connection and once the connection is established everybody logged on to the LAN can access the Internet. In such a situation if there is any file downloaded from the Internet then like any other file, this file will be accessible to all LAN clients. The only problem here is that the more the number of users logged onto the LAN and working on the Internet, the slower will be the Internet connection. However, this is successful if you have a very fast server software along with a very fast line. Again extra software like proxy servers are also required to serve the needs of various individual LAN users with one Internet connection.

## **2. Integrated Services Digital Network Connection (ISDN)**

This is a very high speed connection to the Internet over normal telephone line. It combines both voice and digital information in a single medium, making it possible to provide the customers with digital as well as voice connections. In ISDN connection, the information which is sent from your computer to the Internet is digital. Here we do not use a normal modem. As no conversion from analog to digital or vice versa is required, so we use an ISDN modem which is merely a terminal adapter. Another difference lies in the fact that the ISDN lines, in order to work, require power from outside. When there is a power shutdown, ISDN lines will not work. ISDN service has many variations but we follow Basic Rate Interface (BRI) Service. Here the ISDN line is divided into three logical channels, namely :

1. Two 64 Kbps B (bearer) channels.
2. One 16 Kbps D (Data) channel.

Thus ISDN is commonly referred to as 2B+D.

Over bearer channels you can send data. If only data is sent then it could be sent at a speed of  $64+64=128$  Kbps but if both data and voice is to travel then one B channel is dedicated to voice and the other to data. The data or D channel is used to send signaling

information for routing data which is being sent over B channels. Those telephone companies which do not have the ability to use D channels remove 8 Kbps from each B channel. Therefore, only 56 Kbps of data can go over each of these B channels.

Apart from voice, many value added services are also being offered like:

1. Telephones will soon have the facility to display name, address, and telephone number of the caller while the telephone rings.
2. When the telephone gets connected to the computer, the caller's database record is displayed on the computer.
3. Call forwarding facility
4. Remote electricity meter reading services.
5. Smoke alarms that automatically call up the hospital, fire station or police station.

**Advantages of using ISDN:**

1. Allows high speed access, i.e., 128 Kbps.
2. No special laying down of wires. The existing copper telephone cables work fine.
3. Can be used for voice, data, graphics, full motion video as data transfer speed is high.

The only disadvantage of using ISDN is that it proves to be an expensive affair as special equipment is required for it and the tariff is also high.

**3. Leased Line Connection (Dedicated Connection)**

As the name suggests, a leased line connection is a permanent connection laid down between you and a modem. As it is permanently lined, you have a 24 hour access to the Internet, seven days in a week. A leased line connection is very useful especially when frequent information has to be accessed from the Internet and also when the volume of data transfer is high. It is also useful if the Internet is to be used for more than 12 hours a day.

This type of connection is the most reliable and has high speed. The only issue behind this connection is its cost.

The cost includes :

1. One time installation (laying down of physical line upto your site).
2. Yearly/periodically maintenance charge.
3. Annual tariff.
4. The necessary one time hardware, software and set up charges.

#### **4. Cable Modem**

In case of cable modem the Internet can be accessed through the normal coaxial television cables with the help of cable modems. Speed of cable modems is 10 to 100 times faster than normal dial-up connection modems. The only catch is that the local cable operator should have the capability to access the Internet over cable TV wires and that cable modems are slightly more expensive than normal modems. One advantage of cable modem connection is that you need not have a telephone line if you want this type of connection to the Internet.

Before giving approximate tariff rates for the different types of connections, let us discuss the role of Videsh Sanchar Nigam Limited (VSNL). VSNL is the gateway to Internet in India. It is also an Internet Service Provider (ISP) so that the user can acquire a connection from it. Until recently, VSNL was the only gateway of the Internet in India but now we have another private gateway, namely, Now Convergence. This organization also has some very good offers like faster downloads. Let us now discuss the role of an ISP.

#### **5. DSL**

DSL or Digital Subscriber Line service is provided through the existing telephone line, but it works differently than regular analog modem dial-up access. DSL operates over normal telephone lines and it can be used simultaneously with the telephone. DSL can increase the connection speed by as much as ten-fold from a standard dial-up modem.

#### **6. Broadband**

This type of access is good for remote locations, where ISDN, cable or DSL are not available. It gives a decent download speed, but to upload the data, the user still needs a regular analog modem to dial in, via a telephone line. Satellite connection can be either a two way service or a one way service. In case of two-way satellite service, the data is transmitted via satellite to a dish antenna at the user's house. In one-way system, the user needs a conventional modem and a telephone link to an ISP. Satellite connection is expensive but sometimes is the only fast option for the people who are beyond the service area of cable and DSL providers.

### **7. Very Small Aperture Terminals (VSATs)**

The two ground stations that communicate with one another via the satellite need not be the same size or transmit data with the same amount of power. Many satellite networks use a large number of small dishes, called VSATs (very small aperture terminals), for the outlying nodes and one central hub with a big dish that can transmit very powerful signals and is very sensitive to incoming ones. This system minimizes the cost of the majority of the ground stations at the expense of maintaining one big one, which can be shared by several users. However, this approach can cause additional delays, because the VSATs aren't powerful enough to talk to one another directly through the satellite; messages must pass through the hub and make two trips into space before reaching their final destination, incurring a double delay.

VSATs are typically used by organizations, such as oil companies, that require data or voice communications between sites distributed over a wide geographical area. Terrestrial links are economical over short distances; their cost climbs quickly as the distance between locations increases. In addition, terrestrial data and voice links, while readily available in cities, are often difficult, if not impossible, to obtain in smaller urban and remote local areas using these links.

## **3.8 HOW TO SELECT INTERNET SERVICE PROVIDER**

Before choosing an ISP, it is important to assess your company's business and marketing goals. In other words, you should determine what your organization will be using the

Internet for. Once you've determined this, you can contact ISPs that serve your geographic area and ask them about their services.

Here are some questions that user may wish to ask when choosing an ISP for Internet connection:

### **General**

- What types of connections are available in your geographic area? (dial-up, ADSL, cable, etc...)
- What equipment (hardware) is necessary to establish a connection? (dial-up modem, cable modem, etc...)
- Does the ISP provide installation software?
- What kind of technical support can you expect?
- What additional perks are offered with each package? (Web space, additional e-mail accounts, etc.)

### **Connection**

- Is the dial-up number billed as a local call?
- Does the ISP provide alternate local dial-up numbers? How many?
- Is remote service available? (regional, national, international)
- What type of connection speed can you expect?
- How often can you expect busy signals?
- What is the service's expected uptime?

### **Cost**

- What payment options are available?
- Is there an initial connection fee?
- Can the type of connection be changed without penalty?
- How will your connection time be charged?

- metered
- flat rate
- bandwidth use
- combination of the above
- Are annual subscriptions offered at discounted prices? (as opposed to monthly charges)
- Are there any other possible charges?

Many of these questions can only be answered while trying for the services. You may want to request a trial period from an ISP so that you can evaluate its performance before signing on with them.

## **Web Hosting**

Most companies that offer Web hosting services will offer basic packages which can be modified to accommodate your specific needs. Requesting and comparing this information is a good place to start when looking for Web hosting services. The following list outlines some important questions that should be answered before you make a decision:

### **General**

- How much bandwidth is available for upload and download? (data transfer)
- How much storage space is available? Can additional space be added at a later date? (data storage)
- Does the ISP allow for commercial Web sites?
- What is the site's expected uptime? What is the company's policy with regards to this?
- Which operating systems do they support? (Microsoft, Unix, Linux...)

## **Services**

- Does the ISP provide shopping cart and other e-commerce technologies and services?
- Are Web-based tools available for site maintenance and configuration?
- Which Web technologies are supported? (databases, programming environments, etc...)
- What kind of technical support can you expect?
- How many e-mail addresses (aliases) are provided per account?
- Are mailing list services available?

## **Costs**

- What is the cost for domain name registration?
- What will be the total monthly cost of your company's desired Web hosting solution?
- Is there a service fee for adding or removing features?
- What is the cost of each additional feature? (databases, additional e-mail addresses, etc...)

Be wary of relatively low advertised prices when choosing a company to host your Web site. These low prices are usually offset by additional costs for basic services, or are indicative of poor performance. You may also want to visit some sites that are hosted by the company to see how they perform.

### **3.9 ISP IN INDIA**

The current ISP scene is witnessing a roller coaster ride. The beginning of the year saw the presence of 25 brands and license for about 256 ISPs granted. The market was crowded, with not enough room for all of them to survive. It was also found that lavish advertising spends with everybody wanting to gain the early mover advantage. Every one focusing on price war, brand building took a pillion seat. Brands that did not build strong brand equity began to find the going tough. As a result, many leading brands too folded



up. The market finally settled with 3 to 5 players, with the future becoming a limited game.

Government issues three kinds of licenses to set up business:

- ISPs that want to operate at a national level will have to apply for category 'A' license. Bank guarantee of Rs.20 million.
- Category 'B' license will cover the four major cities and metros of the country in addition to 20 telecom circles. Bank guarantee of Rs.2 million.
- Category 'C' for smaller areas. Bank guarantee of Rs. 3 lakhs.

There is no limit on the number of players in an area and a company can apply for as many licenses as he/she wishes to apply. Private ISPs can establish their own gateways after obtaining security clearances. They have the option to use Videsh Sanchar Nigam Limited (VSNLs) gateways. ISPs can also interconnect among themselves and provide services to V-SAT substations. With the mushrooming of ISPs, the differentiator would be service standards, bandwidth to the Internet, uptime, customer education, training and support.

It is essential in India, that ISPs have to provide not only access and make money from that, but also:

- Provide additional businesses like hosting,
- Creating homepages and websites,
- Marketing the necessary equipment and
- Software the customer needs to set up business like modems, PCs, web browsers and authoring packages.

It is very unlikely that process would fall below the current levels. When the number of players are less, the price would stabilize Price cuts have not worked and when the market matures, the discerning users will increase, according to few experts. Some of the ISPs have already formed a castle in the north to arrest further price fall. This would happen even at other places. Free ISPs (FISPs) also made their presence last year. They

however, have a price not just in terms of the overall viewing area, that will be taken up by advertising banners, but in the type and extent of personnel information required to be provided. Before getting free access, most ISPs require demographic information at the time of sign-up. During the beginning of the year, the free ISPs did affect the market. Today, with most of the FISPs shutting shop, the market is growing. Free service providers will not be able to provide quality surfing experience, according to some people. The free ISPs target revenue out of sponsorships and advertisements. Many a times, customers know that using FISP is not economical enough as the download is supposed to be slower than a paid ISR resulting in longer time taken to browse and with added telephone cost.

While choosing a FISR it is imperative to consider:

- (i) Whether the service is available in the area (local dial-up number)
- (ii) The ISP has sufficient resources,
- (iii) The size of the banners
- (iv) Extent of personal information needed and
- (v) Case of software set up.

<b>Free ISPs and their Services</b>				
<b>Name</b>	<b>Banners</b>	<b>Speed</b>	<b>E-mail</b>	<b>Support</b>
caltiger.com	Yes	56 K	Pop	E-mail, FAQ, Tel.
bharat connect	Yes	56 K	Web Pop	-
cheecoo.com	Yes	-	-	E-mail, FAQ
freedialin	Yes	56 K	Web	E-mail, FAQ, Tel.
Logfree.com	-	56 K	-	-

The ISP business is a long-term business and has no short-term returns. With the growth of Internet business, allied services like intranet business will be the real opportunity. There are about 1.2 million ISP users in India as against a figure of 120 million in the US. Hence, this industry is poised for growth. Going by the present indications, the Internet

industry will continue to boom by itself and also because of the technologies like WAP enabling browsing the net for information on a mobile phone or a palm top.

### **3.10 SUMMARY**

As with any purchase, familiarity with a product will help you make a better decision. Find out which ISPs other people are using and ask them why. It should be noted that reluctance, on behalf of a potential ISP, to answer your questions is a negative indicator; the company may be hiding product/service deficiencies.

Make sure that you read the ISP's service contract before you commit to it. That way you'll know what to expect in event of a closure, merger or if the quality of Service does not meet your expectations

### **3.11 KEYWORDS**

**Internet:** It is network of all networks through out the world

**www:** World Wide web, it is a collection of all web server

**Modem:** Modulator and demodulator, it is a device used for converting analog signal to digital and digital signal to analog signal. Used in internet access.

**ISP:** Internet service provider, these are companies, who provide internet and value added services to the users

**DNS:** Domain Name System, a method for naming websites, It is also the worldwide system of distributed databases of names and addresses on internet.

### **3.12 SELF ASSESSMENT QUESTIONS**

1. What is internet? Discuss major applications of internet.
2. Why internet is so famous?
3. What are the various hardware and software requirements to have internet on computer system?
4. Define ISP. Discuss the various criterion for selecting an ISP.
5. Discuss various types of internet account with their characteristics and limitations.
6. Define the following terms:

- a) WWW
- b) Internet
- c) Modem
- d) DNS

### **3.13 SUGGESTED READINGS**

- Kalakota, Ravi and Whinston, Andrew B. “Electronic Commerce – A Manager’s Guide”, Pearson Education, Inc.
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# **LESSON: 4**

## **INTERNET AND WORLD WIDE WEB**

**Subject: E-Commerce**

**Paper Code: MM-409/IB-419**

**Author: Dr. Anil Khurana**

**Vetter :**

### **STRUCTURE**

- 4.0 Objectives
- 4.1 Introduction
- 4.2 Advanced Concept of Internet
- 4.3 Internet Tools
- 4.4 Definition of www
- 4.5 www Technologies
- 4.6 Summary
- 4.7 Keywords
- 4.8 Self Assessment Questions
- 4.9 Suggested Readings

### **4.0 OBJECTIVE**

Most early internet programmes were command-line programmes. The World Wide Web has changed all that. Instead of requiring to know archive commands, the www gives a graphical view of the internet. The web is easy to use; it is easy to create web pages and to link them to other web pages.

After going through this lesson, you will be:

- Describe the advanced internet concepts
- Explore various internet tools and www technologies

### **4.1 INTRODUCTION**

Internet is a network for the elite, but it is very egalitarian. It has valuable information but works at no extra charge.

The Internet is a rapidly growing network of thousands of business, educational and research networks connecting millions of computers and their users in over 100 countries. Internet is very popular in the recent days, though it took birth in the late 1960's. The US Government started the process when they laid the framework for the Internet. The Department of Defence (DOD) decided to fund a network of computers that would all talk the same language. The intention was to connect researchers, government workers and defence contractors who were providing systems and data to government agencies. Most brands of computers at that time applied different rules for communication (protocols). DOD decided to develop a vendor-independent suite of protocols. The new network was named ARPANET (after the Advanced Research Projects Agency) within DOD that provided the funding.

ARPANET protocol was replaced in 1970's by TCP/IP protocol suite. The features in these protocols permitted transmission of data in an efficient way from any computer connected to the ARPANET to any other on the net. It is thus the foundation for the Internet as we know today. The chronological events that took place are as under:

- 1969 First ARPANET installed at UCLA in Sept. 1969 : ARPANET used special purpose computers IMPs (Interface Message Processors); created Network Communication Protocol (NCP)
- 1972 E-mail was invented by accident for sending messages by two programmers. Ray Tomlinson of BBN is credited for sending the world's first e-mail message in 1973; First Killer application for commercial users.
- 1973-74 In mid 1970s, Transport Control Protocol/Internet Protocol (TCP/IP) was developed by vintcerf to link different packet networks; These were capable of connecting multiple independent networks through routers/gateways.
- 1978 US government preferred TCP/IP;
- 1980 DARPA funded the development of Berkley UNIX TCP/IP was made part of the operating system.

- 1980-86 National Science Foundation (NSF) supported the development of CSNET, a computer I science research network. CSNET became popular (with 170 universities, other organisations: and networks in other countries).
- 1986 NSF initiated a new program of networking and computer support for super computing centers for research. IT launched the NSFNET network backbone program.
- 1987 CSNET merged with BITNET, the backbone was upgraded from 56 Kbps to TI service (1.5:1 .Mbps); TI was operational in 1988.
- 1991 CSNET service discontinued. Internet connectivity had become essential tool for the conduct of scientific research; NSFNET program had outgrown its initial vision (of 1985). Successor program established by High performance computing act of 1991.

The three parallel activities of this are :

- Commercialization of the Internet (as found even today)
- High performance computing and communications (HPCC Program)  
(As found even today)
- National Information infrastructure (Information Superhighway)  
(As found even today).

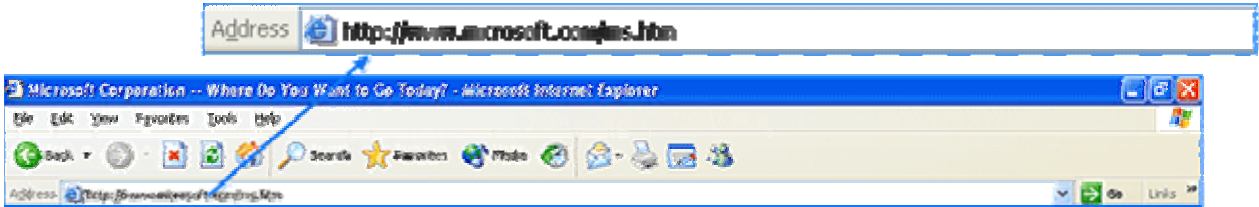
US government requirement was to ensure that the system way secure and would allow continued cooperation between these sites and computers in the case of nuclear attack.

The internet evolved from a military focus towards non-military use with many simultaneous developments like:

- E-mail
- Office productivity applications
- personal computer
- Software products
- workgroup computing
- Local area network

## **4.2 ADVANCED CONCEPT OF INTERNET**

### **Uniform Resource Locator**



A URL (or uniform resource locator) is the address of an Internet page on a Web site. Usually it consists of four parts: protocol, server (or domain), path, and filename. Often, when you go to the very first page of a Web site, called the home page, there's no path or filename. Here's an example:

**http://www.microsoft.com/windows/default.asp**

- http is the protocol
- www.microsoft.com is the server
- windows/ is the path
- default.asp is the filename of the page on the site

**Communication Protocol**

Protocol is a set of rules created for the process of communication with another computer or with an operating system

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.

<b>Table : Common Protocols</b>	
<b>Protocol</b>	<b>Use</b>
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.

**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 organize 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.

### **Transmission Control Protocol / Internet Protocol (TCP/IP)**

Transmission Control Protocol and Internet Protocol ( TCP/IP ) are most commonly used protocol in the Internet. They mainly deal with slicing the data into small sized packets and routing them along the communication channel. These packets are routed to their destination and passed through from node to node and are assembled in order to form the data at the destination computer.

TCP/IP is a very popular protocol used in conjunction with internet. To establish a link between two computers on the internet, it is required to frame certain rules and regulations so that the data communication between the computers may take place. A protocol means a set of rules which is accepted globally. TCP/IP is the protocol which defines the rules and algorithm for data communication between different computers.

To establish a link between two or more computers, it is required to define the address of the computer. This address must be unique. Rules and regulations for secure transmission

of data over the communication channel are also required. TCP/IP is divided into two set of protocols one is called TCP or Transmission Control Protocol and other is called IP or Internet Protocol.

### **Transmission Control Protocol**

This deals with packets over networks. The packets are small pieces of data meant for effective and safe communication over the network. To send a block of data over a communication channel, the data is divided into various pieces and these pieces of data are communicated as packets. These packets' have to follow a long path, traversing from one computer or node to another computer. This process is called routing. The size of packets is decided on the basis of network capability. The TCP also ensures the safe delivery at the destination and the assembling of all the packets to get the complete lot of data at the destination computers.

### **Internet Protocol**

This mainly deals with the addresses of computers. The Internet Protocol decides the address of computer to be labelled on the packet. This allows various computers or intermediate nodes to read the address of the destination computer and route the packet to the destination node.

### **Hyper Text Transfer Protocol (HTTP)**

A web page is transferred to a user's computer via the hypertext transfer protocol (HTTP). HTTP is the method through which hypertext files such as web pages, are transferred over the internet. HTTP is a client/server based internet protocol.

Web pages generally reside on HTTP servers. A user requests a web page from an HTTP server through his or her web browser client software. Either by clicking on a hypertext link or designating a particular URL (uniform resource locator). The server then sends the requested information to the user's computer. The browser software interprets the HTML codes and presents the information contained in the web page in a readable format on the user's computer.

## **File Transfer Protocol (FTP)**

FTP is part of the TCP /IP protocol suite. It is a protocol or set of rules, which enables files to be transferred between computers. Ftp works on the client/ server principle. A client programme enables the user to interact with a server in order to access information and services on the server computer. Files that can be transferred are stored on computers called FTP servers. To access these files, an FTP client programme is used. This is an interface that allows the user to locate the file(s) to be transferred and initiate the transfer process.

Anonymous ftp allows a user to access a wealth of publicly available information. No special account or password is needed. There are a wide variety of files that are publicly available through anonymous ftp. They are:

*Shareware:* software that you can use free for a trial period but then pay a fee for the licensed version.

*Freeware:* completely free software, for example fonts, clipart and games.

*Upgrades and Patches:* upgrades to amend software and fixes for software- problems available either free or against charges.

*Documents:* examples include research papers, articles and Internet documentation.

Files on FTP servers are often compressed. Compression decreases file size and this enables more files to be stored on the server and makes file transfer times shorter. In order to use a compressed file the user needs to decompress it using appropriate software. It is a good idea to have current virus checking software on the computer before files are transferred on it.

Ws-FTP32 LE is a top rated and very popular FTP programme from John Junod. It is given away free to certain non-commercial users.

### **Simple Mail Transfer Protocol (SMTP)**

This protocol is used for the delivery of E Mail. When an E mail is to be sent, then the Mail Transfer Program contacts the remote machine and forms a TCP connection over which to e-mail is transferred. Once the connection is established, then Simple Mail Transfer Protocol (SMTP) identifies the sender itself, specifies the recipient of mail and then transfers the E mail message. Other features included in the SMTP are that it allows the sender to ask whether the mailbox to which the mail is directed, does exist on the remote computer or not. It also enables the sender to keep a copy of the mail until it removed or deleted.

### **Post Office Protocol**

If you're accessing the Internet using a PC or Macintosh, there are several different ways you can read and send email. One of the more popular applications uses the Post Office Protocol (POP). In a nutshell, the POP system allows your personal workstation to get its email from a big computer that serves as a post office, delivering the mail when you (or your computer) ask for it. This eliminates the need for your computer to be on all the time, constantly available to receive email. In order to use a POP-based email application, you need Internet access (via dial-up or full-time connectivity) and a POP mail account on a post office computer (ask your Internet provider). All of these applications provide intuitive editors.

### **Point to Point Protocol (PPP)**

This is used when the Internet is accessed using a telephone line. Normally, in India, the server of the Internet Service provider (ISP) is accessed from the home or office through the telephone line. PPP is the set of rules which specify how the data will be communicated over telephone line from your computer when the connection with your ISP has been established. This protocol is used in conjunction with Serial Line Internet Protocol (SLIP).

This protocol is used when the communication is done over a serial transmission line like the telephone line. The protocol allows the user to use GUI based web browsers like Netscape and MS Internet Explorer. Internet Service providers use the PPP and SLIP account to enable users to view graphics on the Internet. These accounts assign an IP address to your computer when a connection is established.

### **Telnet**

Telnet is a protocol, or set of rules, that enables one computer to connect to another computer. This process is also referred to as remote login. The user's computer, which initiates the connect icon, is referred to as the local computer and the machine being connected to, which accepts the connection, is referred to as the remote or host computer.

Once connected, the user computer emulates the remote computer. When the user types in commands, they are executed on the remote computer. The user monitor displays what is taking place on the remote computer during the telnet session.

### **Gopher**

Gopher is a protocol designed to search, retrieve and display documents from remote sites on the Internet. It accomplishes this using the client / server model of users running client software on their local machines that provide an interface that interacts with remote servers or computers that have information of their interest. In addition to document display and document retrieval, it is possible to initiate on-line connections with other systems via gopher. Information accessible via gopher is stored on many computers all over the Internet. These computers are called gopher servers.

Users interact with gopher via a hierarchy of menus and can use full-text searching capabilities of gopher to identify desired documents. Once an appropriate item is selected, gopher retrieves it from wherever on the network it resides and (if it is text) displays it. The users may feel as if all the information available to gopher resides on their local computer, when in fact, gopher is interacting with a large number of

independently owned and operated computers around the world. Gopher client software exists for most computer platforms.

### **Archie**

These are thousands of anonymous ftp servers around the world offering more files than you can imagine. The role of Archie is to make the whole system manageable by helping you find what you need. There are a number of Archie servers around the net, each of which consists a database of most of the files that are publicly available via anonymous ftp.

Suppose you want a particular file -for instance, a programme but you don't know which anonymous ftp server has the file. You use an Archie client to connect to an Archie server. You can have your client ask the server to search for files that have the same name as the programme you want.

After a short wait, the server will send back a list of addresses of some of the Internet sites that have files with that name. Once you know where to look, it is a simple matter to use ftp to download the file. The term Archie was chosen to express the idea of an archive server.

### **Veronica and Jughead**

Like the web, Gopherspace is large and full of menu items than you could ever find on your own. To help you find things in Gopherspace you can use veronica: a tool that keeps track of an enormous number of gopher menu items from all over the net. You can use Veronica to perform a search and look for all the menu items in gopherspace containing certain keywords. A related tool, Jughead does the same thing for a specific group of gopher menus, say, and all the menus at a particular university.

After Veronica or Jughead finishes searching, you will be presented with a new menu containing the names of whatever items were found. To access one of these items, all you need to do select it, and your gopher client will connect you to the appropriate gopher

server automatically. The results of a typical Veronica search will be items from around the net, but you won't need to know any of the details: your client will take care of everything for you.

### **Wide Area Information Service (WAIS)**

WAIS is an Internet search tool that is based on a certain protocol. It works on the client / server principle. A WAIS client programme enables the user computer to contact a WAIS server, submit a search query and receive a response to that query.

WAIS has the capability of simultaneously searching more than one database. After the search phrase has been typed into the client interface, the user can then choose which databases should be used to complete the search. Depending on the WAIS client software being used, this may be a matter of using a mouse to select database names displayed on a screen, or of typing in the database names using the keyboard. It is very important to know that WAIS indirectly searches the database. The database itself is not being searched for the requested search phase. Rather, an index for the database is searched. The index is created by people, and can contain all, or a number of words in all of the items contained in the database. Once the search has been executed, all items containing the words appearing in the search phrase will be returned to the user, provided that the words in the search phrase appear in the indexes of the selected databases.

## **4.3 INTERNET TOOLS**

### **E-mail**

The conventional mailing by post can take several days to travel across the country and weeks to go around the world. That is why nowadays it is referred to as 'snail mail'. In recent times, e-mail or electronic mails being used to send and receive messages. It saves time and money, is fast, easy to use and less expensive than the post. You can send e-mail practically to anyone with an e-mail address, anywhere in the world. So what is e-mail? Its simplest form, e-mail is an electronic message sent from one computer to another. You can send or receive personal and business-related messages with attachments like pictures or other documents.

Just as a letter or document stops at the different postal stations along its way, e-mail is passed from one computer to another as it travels along the network. Each computer reads the e-mail address and routes it to another computer until it eventually reaches its destination. It's then stored in an electronic mailbox. With the internet this whole process usually takes just a few minutes, allowing you to communicate quickly and easily with millions of people around the world anytime of the day or night, for the cost of a local phone call.

Until recently, e-mail on the internet was good only for short notes. You couldn't send attachments like formatted documents or graphics. With the advent of MIME (Multipurpose Internet Mail Extension) and other types of encoding schemes, like UUencode, not only can you send messages electronically, but you can also send formatted documents, photos, sound files, and video files as attachments.

### **Search Engine**

Search engines are Web sites that help you search the Internet for other Web sites based on keywords you provide.

Databases of web sites that use spiders or robots to search the web and catalog web pages and make it convenient for you to search. Popular search engines include:

Google	Lycos
Yahoo	Altavista
Infoseek	Excite
Indiatimes	Hotbot etc.

Special www sites that offer a facility by which you can search the web or Usenet for information. Alta Vista (<http://www.altavista.co.uk/>), for example, provides a keyword search that scans every word of every page on the web. Yahoo permits you to search by following ever-decreasing menus. Your browser will take you to a site featuring a number of web search engines.



## **Newsgroups**

Discussion groups on the Internet (not on the Web, which is only one area of the Internet). Newsgroups are classified by subject matter and do not necessarily deal with journalism or “news.” Health, hobbies, celebrities, and cultural events are the subjects of many newsgroups. Participants in a newsgroup conduct discussions by posting messages for others to read, and responding to the messages posted by others.

Newsgroups, also referred to as forums, have been around almost since the dawn of the Internet. They enabled scientists to post questions (and answers) to each other. Today, newsgroups resemble virtual coffee houses, where people get together to discuss subjects of mutual interest. Except with newsgroups, the communication is written, not verbal. Newsgroups revolve around specific topics, such as wireless technology or organic gardening. You can read what others have written and post your own comments.

There are literally thousands of newsgroups covering every topic imaginable--from computers, social issues, literature and science, to recreation, entertainment, hobbies and current affairs. In newsgroups you can find job postings, business and health care advice, announcements about events, referrals, political and religious discussions--even photos you can download.

## **Internet Relay Chat (IRC)**

IRC works because a series of IRC servers band together in a network to share channels of communication, like communicating with someone or a group on a single radio frequency. If you connect to one server in such a network, you have access to all the channels and all the users connected to any of the servers on that network

There have been chatting on the internet since Unix users were able to page each other using the talk username @ address command. Unlike e-mail, chatting takes place live and is called as real time, meaning both people participating at the same time. Chat is

synchronous (happening for all participants at the same time), and e-mail is asynchronous (taking place at different times).

Chat protocol permitted many people to converse with each at once. Finally IRC (.Internet relay chat) provide for multiple channels where completely separate conversations, all potentially many-to-many become available to anyone on the Internet. The IRC protocol remains the underlying basic for other forms of real- time communication (such as voice or video conferencing). The standard chat interface, with a big dialogue window, a narrow list of participants and a command line at the bottom for typing your responses, continues to be used in many real-time collaboration tools.

### **Video Conferencing**

It's the technological age, there's no doubt about it. You look around and you see people speaking on cell phones everywhere; people working on their laptop computers or PDA's; People taking pictures with their digital cameras, or listening to music on their digital mp3 players. The technology is evolving so quickly that it can barely keep up with itself. One area in which we are seeing rapid technological developments as of late is within the video conferencing industry.

Although the technology that makes video conferencing possible has been around for a several years now, it is hasn't received too much attention until recently, now becoming more and more popular every day. What is video conferencing? Basically, video conferencing can be easily described as a telephone conversation that allows you to be face-to-face with one another. This technology will never replace the person-to-person meeting completely, but it does offer an incredible tool for better telecommunication & can save companies hundreds of thousands of dollars in travel costs; and these applications are just scratching the surface:

### **Internet video conferencing**

High quality Internet video conferencing offers an internet based software product that allows users who log on the ability to partake in video conferences. After some form of software and its accessories are installed and the hardware components are set up, users

have the ability to engage in face-to-face meetings with family/friends/business associates across the globe through the Internet. The quality of the transmission/reception depends entirely upon the amount of bandwidth and the quality of the software employed. If you have a great deal of bandwidth and superior software complete with top-of-the-line codecs, your compression/decompression rates will be higher and so too will the level of quality.

#### **4.4 DEFINITION OF WORLD WIDE WEB (WEB, WWW OR W3)**

World Wide Web (www) is a repository of information spread all over the world and linked together. WWW uses the concept of hypertext. In this environment, information is stored in a set of documents. Concept of pointers are used to link the documents together. An item could be associated with another document using the pointers. A reader who browses through a document can move to other documents by clicking the items that are linked to other documents. A hypertext on the web is known as a page and the main page for an organisation / an individual is called as a home page. After establishing a web hosting arrangement with ISP it will allocate storage space on its server that will be accessed each time a request comes in. We are now ready to create our first web page or home page or index page and load it into this storage space. Web pages are created, using one of the many web design software packages like 'Quicksite' or Microsoft's 'Front page' or by utilising the services of a web designer. Web pages utilize the main software language of the Internet HTML although many now use other languages and software in addition to HTML, such as Java by Sun Microsystems or Coldfusion by Allaire. Information on any subject can be:

- Undistributed -whole information may consist of one or more web pages on the same server.
- Distributed -Information made up of many pages distributed on different servers.

It is another information retrieval tool. The web is attractively easy to use, and lends itself to publishing or providing information to anyone interested. Its popularity has increased dramatically, because of easy usage, colorful and rich in content. Web is a series of

interconnected documents stored on computer sites. If you use your computer and a software program (browser) to visit a site on the web, the screen displays a document called a home page. Home page gives the name of the organisation or individual sponsoring the website and displays a list of highlighted words, buttons or pictures. It is the text and graphical screen display that welcomes the user and explains the organisation that has established the page. This will lead to other pages, with all the pages of company being known as a website. For a corporation to establish a presence on the web, therefore, it must set up a website of its one or more pages. The web is a network of billions of interlinked documents. These links called hyperlinks or links are the highlighted words, buttons, icons or pictures. Each link contains the address of another document on the same computer or another computer anywhere in the world; from this one can jump to the linked pages by clicking on one of these links. Clicking them plays videos, music, 3D animations or takes one through a virtual reality experience.

It is a set of standards for storing, retrieving, formatting and displaying information using a client / server architecture, graphical user interfaces (GUI) and a hyper text language that enable dynamic links to other documents. It is one of the most exciting Internet services. Worldwide Web (www) has a vast canvas of web servers that provide an idea almost similar to that of a hypertext. A page in hypertext may contain links that point to other documents or to other segments in the same document. When users click on a link, they jump to other documents/other segments in the same document. Users can navigate the web easily, pushing their interests.

One of the main functions of the Internet is easy to use offerings of information and products. This function is provided by the World Wide Web which is at the heart of the recent explosion in the business use of the Net. This is based on an hypertext language called Hypertext Mark up Language (HTML) that formats documents and incorporates dynamic links to other documents and pictures stored in the same or remote computers.

World Wide Web and Internet are not the same though people think they are the same. The Internet is the network itself and many activities other than the world wide web will

be done on it. The services like E-mail, Gopher, Usenet news groups are available separately, and access to them has been integrated into the world wide web. While the other methods of locating information on the Net are mainly text based, the web pages have made an impact by combining text, hypermedia, graphics and sound. Through the use of web, commercial enterprises are providing information on demand (say customer support, marketing and sales). The specific hypermedia technology used in the web is known as hyperlink, navigating (or surfing) the web requires a graphics computer linked to the Internet and web browser. The user must also have a special software tool to navigate the web known as a web browser. A popular web browser is Mosaic, developed by the National Centre for Super Computing Applications. There is another web browser known as Travel Web, a website that gives complete details of electronic information on 16 resort hotels in the USA and the Caribbean and similar information on 87 non-resort hotels in North America. Prospective travellers can use Travel Web any time to find out information on hotel details, sight seeing attractions related to USA and Caribbean. The world wide web needs:

- A functional architecture.
- A structural Architecture and
- A navigational architecture

## **4.5 WWW TECHNOLOGIES**

### **Web Page**

A web page is a single unit of information, often called a document that is available via the World Wide Web (www). A web page can be longer than one computer screen and can use more than one piece of paper when it is printed out.

A web page is created using HTML. It consists of standardized codes or “tags”, that are used to define the structure of information on a web page. These codes enable web pages to have many features including bold text, italic text, headings, paragraph break and numbered or bulleted lists.

## **Web Browser**

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.

### **Hypertext Markup language (HTML)**

HTML defines several aspects of a web page including heading levels, bold, italics, images, paragraph breaks and hypertext links to other resources. HTML can be compared to word processing. The text in a word processed file can be formatted in various ways. For example, a heading can be bold and in larger font size than the rest of the document. Also, specific words can be italicized for emphasis.

Thus, HTML is a way to define the formats of text in a web page. However, it goes further by also being able to define placement of graphics and hypertext links. HTML is a sub-language of SGML, or Standard Generalized Markup Language. SGML is a system that defines and standardizes the structure of documents. Both SGML and HTML utilize descriptive markup to define the structure of an area of text. In general terms, descriptive markup does not specify a particular font or point size for an area of text, Therefore, in HTML, text is marked as a heading, subheading, numbered list, bold, italic, etc.

HTML is standardized and portable. A document that has been prepared using HTML markup “tag” can be viewed using a variety of web browsers, such as Internet Explorer, Netscape and Lynx. A browser interprets the tags in an HTML file and presents the file as a formatted, readable web page. In addition, HTML documents can be viewed on all types of systems, such as Macintosh, PC’s and UNIX machines.

### **HTML Tags**

HTML tags are used to define areas of a document as having certain characteristics. The tags used in HTML usually consist of a code in between two “wickets”. These codes are called container tags because the formatting described by the tag affects only the text

contained between the tags. For example, <B> and </B> are the starting and ending tags used to indicate an area as bold. HTML tags are used to define heading levels, such as <H1> and </H1>. Heading levels can go to <H6>, with each successive number indicating a smaller heading size.

Some other basic HTML tags are:

- <i> and </i> to indicate italics
-  to place an image in a document file
- <br> to create a paragraph break

In HTML, some codes require end tag and some do not require end tags. In the previous example, the <br> tag indicates a paragraph break. This type of tag is called an empty tag because no end tag is required.

Web pages can contain text, images, sound files, video files and hyperlinks to other internet resources. All these features are indicated by using HTML codes.

#### **4.6 SUMMARY**

Internet is one of the most promising information technology applications connected by high speed network, used by the individuals for the information exchange, to compile information and to get acquainted with information and for transmitting the information. It is a tool for the buyers and sellers gathering in virtual market-place and revolutionizing the way business is conducted particularly in areas of trading systems, retail merchandising and brokerages. Global networking, computers and people who use them are completely transforming the global economy.

“No communication medium or consumer electronics technology has ever grown as quickly; not the fax machine, not even the PC”. “The Internet is forecast to have more connections than there are people in the world by the early part of the new century”. “The information superhighway may be mostly hype today, but it is an understatement about tomorrow. It will exist beyond people’s wildest predictions”. “Like the PC, the Internet is



a tidal wave. It will wash over the computer industry and many others, drowning those who don't learn to swim in its waves”.

The Internet is computer network that connects millions of computers globally and provides world-wide communications to businesses, homes, schools and governments.

Internet has grown explosively in the 1990s. There are more than four million server computers on the Internet, each providing some type of information or service. The number of users of the Internet is harder to measure. Since each service on the Internet is used by many people, many millions of users are currently on- line. The number of users and services on the Internet continues to grow rapidly even as the variety of services increases.

World Wide Web (www) the newest Internet service has accelerated the growth of the Internet by giving it an easy to use, point and click graphical interface. Users are attracted to the WWW because it is interactive, it is easy to use, and it combines graphics text, sound, and animation making it a rich communication medium.

The www provides a network of interactive documents and the software to access them. It is based on documents called pages that combine text, pictures, forms, sound, animation and hypertext links called hyperlinks. To navigate the www, users “surf” from one page to another by pointing and clicking on the hyperlinks in text or graphics.

The www provides many things to its millions of users. It is used as a market place, art gallery, library, community center, school, publishing house, and whatever else its authors create. The World Wide Web, also referred to as the www or W3 or simply “the web,” is the universe of information available via hyper text transfer protocol (HTTP).

#### **4.7 KEYWORDS**

**URL:** Uniform resource locator is the address of an Internet page on a web site.

**TCP/IP:** Transmission Control Protocol and Internet Protocol ( TCP/IP ) are most commonly used protocol in the Internet

**http:** Hyper Text Transfer Protocol, A web page is transferred to a user's computer via the hypertext transfer protocol (HTTP). HTTP is the method through which hypertext files such as web pages, are transferred over the internet. HTTP is a client/server based internet protocol.

**ftp:** File Transfer Protocol, It is a protocol or set of rules, which enables files to be transferred between computers

**smtp:** This protocol is used for the delivery of E Mail.

**pop:** Post Office Protocol allows personal your workstation to get its email from a big computer that serves as a post office, delivering the mail when you (or your computer) ask for it.

**ppp:** This is used when the Internet is accessed using a telephone line

**Telnet:** Telnet is a protocol, or set of rules, that enables one computer to connect to another computer.

**Gopher:** Gopher is a protocol designed to search, retrieve and display documents from remote sites on the Internet.

**Archie:** The role of Archie is to make the whole system manageable by helping you find what you need.

**Veronica:** Veronica is used to perform a search and look for all the menu items in gopherspace continuing certain keywords.

**WAIS:** Wide Area Information Service is client programme enables the user computer to contact a WAIS server, submit a search query and receive a response to that query.

**e-mail:** Electronic mails being used to send and receive messages through internet.

**Search Engine:** Search engines are Web sites that help you search the Internet for other Web sites based on keywords you provide.

**Newsgroup:** Discussion groups on the Internet are called newsgroups.

**IRC:** Internet Relay Chat, a method for chatting on internet.

**Web page:** A web page is a single unit of information, often called a document that is available via the World Wide Web (www).

**html:** Hyper Text Markup Language, the language used for designing web pages.

#### **4.8 SELF ASSESSMENT QUESTIONS**

1. What is a protocol? Define various types of protocols used in communication.
2. What is TCP/IP? Discuss its transport layer.
3. What is http? What is its role in internet?
4. Define the following terms:
  - a) Gopher
  - b) Archie
  - c) Veronica
  - d) WAIS
5. What is an e-mail? How e-mail works?

#### **4.9 SUGGESTED READINGS**

- Kalakota, Ravi and Whinston, Andrew B. “Electronic Commerce – A Manager’s Guide”, Pearson Education, Inc.
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# **LESSON: 5**

## **ELECTRONIC PAYMENT SYSTEMS**

**Subject: E-Commerce**

**Paper Code: MM-409/IB-419**

**Author: Prof. Mukesh Dhunna**

**Vetter :**

### **STRUCTURE**

- 5.0 Objectives
- 5.1 Introduction
- 5.2 Types of Electronic Payment Systems
- 5.3 Dimensions of Electronic Payment System
- 5.4 Traditional Payment Systems vs Electronic Payment Systems
- 5.5 Electronic Payments and Protocols
- 5.6 Security Requirements in Electronic Payment Systems
- 5.7 Electronic Payment Systems and Consumer Empowerment
- 5.8 Desirable Properties Of Digital Currency
- 5.9 Prospects of Electronic Payment Systems
- 5.10 Managerial Issues in Electronic Payment Systems
- 5.11 Electronic Payment Systems in India
- 5.12 Future of Electronic Payment Systems
- 5.13 Summary
- 5.14 Keywords
- 5.15 Self Assessment Questions
- 5.16 Suggested Readings

### **5.0 OBJECTIVES**

For electronic commerce to have a chance to meet the soaring expectations set in the press with regards to the Internet, efficient and effective payment services need to be established and accepted by businesses and consumers alike.

After going through this lesson, you will be able to:

- Describe the concept of Electronic Payment System
- Define various types of Electronic Payment System
- Explore various dimensions of Electronic Payment System
- Identify security issues in Electronic Payment System
- Explore the managerial issues in Electronic Payment System
- Explore the future of Electronic Payment System in India

## **5.1 INTRODUCTION**

Electronic payment systems are central to on-line business process as companies look for ways to serve customers faster and at lower cost. Emerging innovations in the payment for goods and services in electronic commerce promise to offer a wide range of new business opportunities.

Electronic payment systems and e-commerce are highly linked given that on-line consumers must pay for products and services. Clearly, payment is an integral part of the mercantile process and prompt payment is crucial. If the claims and debits of the various participants (consumers, companies and banks) are not balanced because of payment delay, then the entire business chain is disrupted. Hence an important aspect of e-commerce is prompt and secure payment, clearing, and settlement of credit or debit claims.

The current state of on-line electronic payments is in many ways reminiscent of the medieval ages. The merchants of Asia and Europe faced a similar problem while trying to unlock the commercial potential of the expanding marketplace. Those ancient traders faced a number of obstacles (e.g., conflicting local laws and customs regarding commercial practices and incompatible and nonconvertible currencies) that restricted trade. To circumvent some of these problems, traders invented various forms of payment instruments. The merchants also developed commercial law surrounding the use of these

instruments that proved to be one of the turning points in the history of trade and commerce. We are on the verge of a similar sort of development today, but one that is unlikely to take anywhere near the centuries it took for the traditional payment system to evolve.

Everyone agrees that the payment and settlement process is a potential bottleneck in the fast-moving electronic commerce environment if we rely on conventional payment methods such as cash, checks, bank drafts, or bills of exchange. Electronic replicas of these conventional instruments are not well suited for the speed required in e-commerce purchase processing. For instance, payments of small denominations (micropayments) must be made and accepted by vendors in real time for snippets of information. Conventional instruments are too slow for micropayments and the high transaction costs involved in processing them add greatly to the overhead. Therefore new methods of payment are needed to meet the emerging demands of e-commerce. These neo-payment instruments must be secure, have a low processing cost, and be accepted widely as global currency tender.

### ***Electronic Payment Systems***

Electronic payment systems are becoming central to on-line business transactions nowadays as companies look for various methods to serve customers faster and more cost effectively. Electronic commerce brings a wide range of new worldwide business opportunities. There is no doubt that electronic payment systems are becoming more and more common and will play an important role in the business world. Electronic payment always involves a payer and a payee who exchange money for goods or services. At least one financial institution like a bank will act as the issuer (used by the payer) and the acquirer (used by the payee).

### ***Awareness of risks Electronic Payment Systems***

Security, legal certainty and trust are important elements, influencing the acceptance of commerce by both individuals and businesses. Furthermore, sociological and cost factors play a significant role.

Several reports on awareness of risks are related to the non-transparent legal background for both companies and consumers. In this context, e-commerce reluctance appears to be more pronounced in firms than in customers. The main reason for firms to be reluctant may be insecurity caused by the lack of legal rules determining when a transaction is legally binding. For customers, in addition to this, the security of on-line payment methods may be decisive. An important issue is credit card acceptance by retailers in Europe. The credit cards were offered to merchants originally on the grounds, that authorized transactions would be honoured. Now the system is established, banks in some countries charge traders for fraudulent transactions, which causes tensions. Some large retailers still refuse to take credit cards because of the terms of business. The result has been a move towards debit cards - which use the same infrastructure but have different contractual terms.

In general, there seems to be no consensus on whether companies and customers clearly distinguish between secured and unsecured methods of payment and whether they would not accept the latter because of the risks involved. Some parties believe that companies and customers clearly distinguish between secured and unsecured methods. However, others maintain that only companies clearly distinguish between secured and unsecured methods. Customers' awareness of risks on the other hand is most probably based on perception rather than on facts, and is therefore less analytical. If both partners in ecommerce (banks and merchants) are reliable and offer convenient payment schemes, customers will make use of them.

The general public remains unaware of the risk issue. The main concern of the average consumer seems to be confidentiality about credit card numbers exchanged on the Internet. Some experts share the view that the perceived lack of security in on-line electronic payments is largely exaggerated and not justified at all by the actual threat. The average consumer does not yet realize that the risk of compromising his card number is far greater in conventional face-to-face transactions than on the Internet. This is partly the result of ignorance and unfamiliarity, as well as a mistaken belief in the security of

traditional payment systems. In this respect, the difficulty of generalizing about the security aspects of all systems should be stressed. There is a wide variety of payment systems with different security features and thus with varying security level.

Many other issues affect the security of electronic payments perhaps even more importantly: e.g. the physical, procedural and personnel security procedures operated at the ends of any telecommunications link (whether via a PC, smart card or mobile phone). It is also fairly well known that most security failures are caused by “insider” threats rather than by external hackers (or crackers).

Confidence in the reliable operation of the terminal equipment(s) is essential.

## **5.2 TYPES OF ELECTRONIC PAYMENT SYSTEMS**

### ***Conventional Payment Process***

A conventional process of payment and settlement involves a buyer-to-seller transfer of cash or payment information (e.g. credit card or check). The actual settlement of payment takes place in the financial processing network. A cash payment requires a buyer's withdrawal from his bank account, a transfer of cash to the seller, and the seller's deposit of the payment to his/her account. Non-cash payment mechanisms are settled by adjusting, i.e. crediting and debiting, the appropriate accounts between the banks based on payment information conveyed via check or credit card. Figure 5.1 is a simplified diagram for both cash and non-cash transactions. Cash moves from the buyer's bank to the seller's bank through face-to-face exchanges in the market. If a buyer uses a non-cash method of payment, payment information instead of cash flows from the buyer to the seller, and ultimately payments are settled between affected banks who notationally adjust accounts based on the payment information. In real markets, this clearing process involves some type of intermediaries such as credit card services or check clearing companies. Schematically then most payment systems are based on similar processes. The 'information' conveyed to settle payments can be one of the following: information about the identities of the seller and the buyer and some instruction to settle payments without revealing financial information [payment clearing systems financial information



such as credit card or bank accounts numbers (including checks and debit cards) actual values represented by digital currency

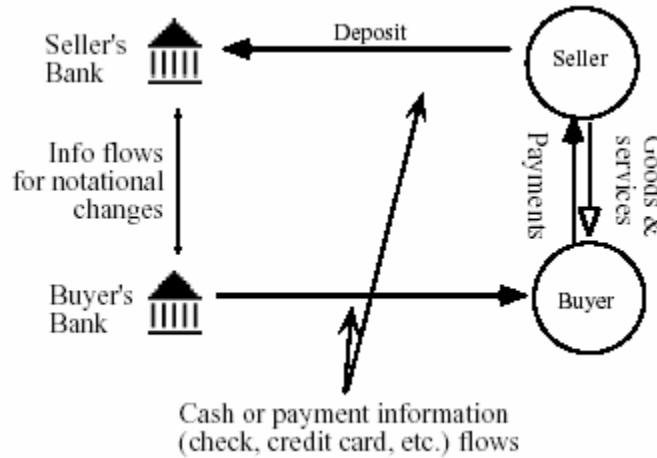


Figure 5.1: A Cheque simplified model of transaction

### **Type 1: Payment Through an Intermediary - Payment Clearing Services**

When face-to-face purchase is replaced with on-line commerce, many aspects of a transaction occur instantly, under which various processes of a normal business interaction are subsumed. For example, a typical purchase involves stages of locating a seller, selecting a product, asking a price quote, making an offer, agreeing over payment means, checking the identity and validity of the payment mechanism, transferring of goods and receipts. In order to be used as a substitute for face-to-face payments, online payment systems must incorporate all or some of these stages within their payment functions. The lack of face-to-face interaction also leads to more secure methods of payment being developed for electronic commerce, to deal with the security problems for sensitive information and uncertainty about identity. Consequently, electronic commerce transactions require intermediaries to provide security, identification, and authentication as well as payment support.

Figure 5.2 shows a stylized transaction for online commerce using an intermediary. In this model, the intermediary not only settles payments, it also takes care of such needs as confirming seller and buyer identities, authenticating and verifying ordering and payment

information and other transactional requirements lacking in virtual interactions. In the figure, two boxes delineate online purchasing and secure or off-line payment clearing processes. Payment settlement in this figure follows the example of the traditional electronic funds transfer model which uses secured private value networks. The intermediary contributes to market efficiency by resolving uncertainties about security and identity and relieving vendors of the need to set up duplicative hardware and software to handle the online payment clearing process. The payment information transmitted by the buyer may be one of three types. First, it may contain only customer order information such as the identity of the buyer and seller, name of the product, amount of payment, and other sale conditions but no payment information such as credit card numbers or checking account numbers. In this case, the intermediary acts as a centralized commerce enabler maintaining membership and payment information for both sellers and buyers. A buyer need only send the seller his identification number assigned by the intermediary. Upon receiving the purchase order, the intermediary verifies it with both the buyer and seller and handles all sensitive payment information on behalf of both.

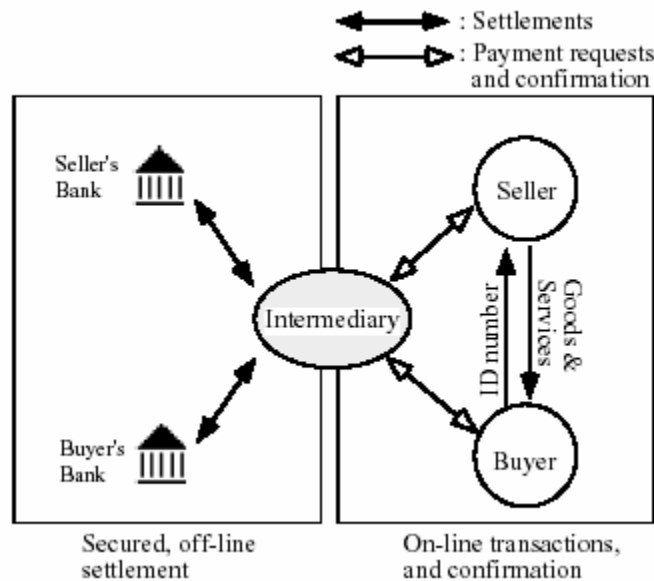


Figure 5.2: Transactions with an intermediary

The key benefit of this payment clearing system is that it separates sensitive and non-sensitive information and only non-sensitive information is exchanged online. This alleviates the concern with security that is often seen as a serious barrier to online commerce. In fact, First Virtual does not even rely on encryption for messages between buyers and sellers. A critical requisite for this system to work is the users' trust in the intermediaries.

### **Type 2: Payment Based on EFT - Notational Funds Transfer**

The second type of payment systems does not depend on a central processing intermediary. Instead, sensitive payment information (such as credit card or bank account number) is transmitted along with orders, which is in effect an open Internet implementation of financial electronic data interchange (EDI) (see Figure 5.3). An electronic funds transfer (EFT) is a financial application of EDI, which sends credit card numbers or electronic checks via secured private networks between banks and major corporations. To use EFTs to clear payments and settle accounts, an online payment service will need to add capabilities to process orders, accounts and receipts. In its simplest form, payment systems may use digital checks —simply an image of a check— and rely on existing payment clearing networks. The Secure Electronic Transaction (SET) protocol - a credit card based system supported by Visa and MasterCard - uses digital certificates, which are digital credit cards. We call this type of payment system as notational funds transfer system since it resembles traditional electronic fund transfers and wire transfers which settle notational accounts of buyers and sellers.

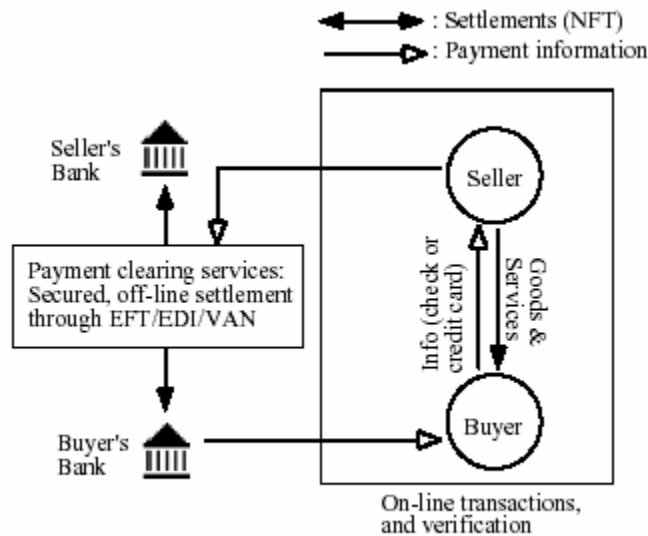


Figure 5.3: Notational funds transfer system

Notational funds transfer systems differ from payment clearing services in that the 'payment information' transferred online contains sensitive financial information. Thus, if it is intercepted by a third party, it may be abused like stolen credit cards or debit cards. A majority of proposed electronic payment systems fall into this second type of payment systems. The objective of these systems is to extend the benefit and convenience of EFT to consumers and small businesses. However, unlike EFTs, the Internet is open and not as secure as private value added networks (VANs). The challenge to these systems is how to secure the integrity of the payment messages being transmitted and to ensure the interoperability between different sets of payment protocols.

### **Type 3: Payment Based on Electronic Currency**

The third type of payment systems transmit not payment information but a digital product representing values: electronic currency. The nature of digital currency mirrors that of paper money as a means of payment. As such, digital currency payment systems have the same advantages as paper currency payment, namely anonymity and convenience. As in other electronic payment systems, here too security during transmission and storage is a concern, although from a different perspective, for digital currency systems doubling, pending, counterfeiting, and storage become critical issues whereas eavesdropping and

the issue of liability (when charges are made without authorization) are important for notational funds transfers. Figure 5.4 shows a digital currency payment scheme.

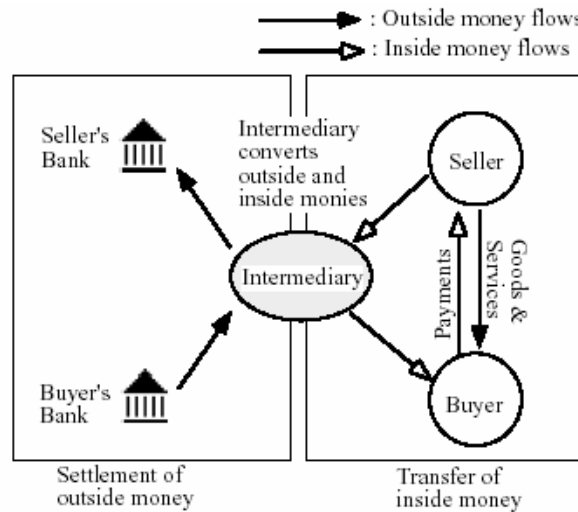


Figure 5.4: Digital Currency Payment Scheme

The only difference from Figure is that the intermediary in Figure 5.4 acts as an electronic bank which converts outside money, into inside money (e.g. tokens or e-cash) which is circulated within online markets. However, as a private monetary system, digital currency will have wide ranging impact on money and monetary system with implications extending far beyond mere transactional efficiency. Already digital currency has spawned many types of new businesses: software vendors for currency server systems; hardware vendors for smart card readers and other interface devices; technology firms for security, encryption and authentication; and new banking services interfacing accounts in digital currency and conventional currency.

### 5.3 DIMENSIONS OF ELECTRONIC PAYMENT SYSTEM

Electronic payment systems can be considered to be merely the next - albeit significant - step in a long line of changes in payment clearing systems. The electronic settling of accounts, for example, has long been an integral part of payment systems using credit cards, debit cards, automatic teller machines, and prepaid cards. What enables any payment mechanism to be processed electronically is the fact that unlike currency, bills, or coins which carry monetary values, non-cash mechanisms are promises or contracts of

payments. Based on the information transmitted or characteristics following a transaction, the appropriate accounts representing notational money are adjusted between banks and financial institutions. The difference between the various types of Electronic payments systems discussed in section 5.2 can be shown by the table 5.1

**Table 5.1: DIMENSIONS OF ELECTRONIC PAYMENT SYSTEM**

<b>Dimension</b>	<b>Cash</b>	<b>Personal Check</b>	<b>Credit Card</b>	<b>Stored Value (Debit Card)</b>	<b>Accumulat -ing Balance</b>
Instantly convertible without intermediation	Yes	No	No	No	No
Low transaction cost for small transactions	Yes	No	No	No	Yes
Low transaction cost for large transactions	No	Yes	Yes	Yes	Yes
Low fixed costs for merchant	Yes	Yes	No	No	No
Refutable (able to be repudiated)	No	Yes	Yes	No (usually)	Yes
Financial risk for consumer	Yes	No	Yes	Limited	No
Financial risk for merchant	No	Yes	Yes	No	Yes
Anonymous for consumer	Yes	No	No	No	No
Anonymous for merchant	Yes	No	No	No	No
Immediately spendable	Yes	No	No	No	No
Security against unauthorized use	No	Some	Some	Some	Some
Tamper-resistant	Yes	No	Yes	Yes	Yes
Requires authentication	No	Yes	Yes	Yes	Yes
Special hardware required	No	No	Yes – by merchant	Yes – by merchant	Yes – by merchant
Buyers keeps float	No	Yes	Yes	No	Yes
Account required	No	Yes	Yes	Yes	Yes
Has immediate monetary value	Yes	No	No	Yes	No

Source: Adapted from Mackie-Mason and White, 1996

#### **5.4 TRADITIONAL PAYMENT SYSTEMS VS ELECTRONIC PAYMENT SYSTEMS**

- ***Offline versus Online*** Offline payments involve no contact with a third party during payment: The transaction involves only the payer and payee. The obvious problem with offline payments is that it is difficult to prevent payers from spending more money than they actually possess. In a purely digital world, a dishonest payer can easily reset the local state of his system to a prior state after each payment. Online payments involve an authorization server (usually as part of the issuer or acquirer) in each payment. Online systems obviously require more communication. In general, they are considered more secure than offline systems. Most proposed Internet payment systems are online. All proposed payment systems based on electronic hardware, including Mondex and CAFE (Conditional Access for Europe), are offline systems. Mondex is the only system that enables offline transferability: The payee can use the amount received to make a new payment himself/herself, without having to go to the bank in between. However, this seems to be a politically unpopular feature. CAFE is the only system that provides strong payer anonymity and un-traceability. Both systems offer payers an electronic wallet, preventing fake-terminal attacks on the payer's PIN. CAFE also provides loss tolerance, which allows the payer to recover from coin losses (but at the expense of some anonymity in case of loss). Mondex and CAFE are multicurrency purses capable of handling different currencies simultaneously. All these systems can be used for Internet payments, and there are several plans for so doing, but none is actually being used at the time of this writing. The main technical obstacle is that they require a smart card reader attached to the payer's computer. Inexpensive PCMCIA smart card readers and standardized infrared interfaces on notebook computers will solve this connectivity problem. Another system being developed along these lines is the FSTC (Financial Services Technology Consortium) Electronic Check Project, which uses a tamper-resistant PCMCIA card and implements a check-like payment model. Instead of tamper-resistant hardware, offline authorization could be given via preauthorization: The payee is known to the payer in advance, and the payment is already authorized during withdrawal, in a way similar to a certified bank check.



- ***Trusted hardware*** Offline payment systems that seek to prevent (not merely detect) double spending require tamper-resistant hardware at the payer end. The smart card is an example. Tamper-resistant hardware may also be used at the payee end. An example is the security modules of point-of-sale (POS) terminals. This is mandatory in the case of shared-key systems and in cases where the payee does not forward individual transactions but the total volume of transactions. In a certain sense, tamper-resistant hardware is a “pocket branch” of a bank and must be trusted by the issuer. Independent of the issuer’s security considerations, it is in the payer’s interest to have a secure device that can be trusted to protect his secret keys and to perform the necessary operations. Initially, this could be simply a smart card. But in the long run, it should become a smart device of a different form factor with secure access to a minimal keyboard and display. This is often called an electronic wallet. Without such a secure device, the payers’ secrets and hence their money are vulnerable to anybody who can access his computer. This is obviously a problem in multiuser environments. It is also a problem even on single-user computers that may be accessed directly or indirectly by others. A virus, for example, installed on a computer could steal PINs and passwords as they are entered. Even when a smart card is available to store keys, a virus program may directly ask the smart card to make a payment to an attacker’s account. Thus for true security, trusted input/output channels between the user and the smart card must exist.
- ***Cryptography*** A wide variety of cryptographic techniques have been developed for user authentication, secret communication, and nonrepudiation. They are essential tools in building secure payment systems over open networks that have little or no physical security. There are also excellent reference works on cryptography.
- ***“Cryptofree” systems*** Using no cryptography at all means relying on out-band security: Goods ordered electronically are not delivered until a fax arrives from the payer confirming the order. First Virtual is a cryptofree system. A user has an

account and receives a password in exchange for a credit card number, but the password is not protected as it traverses the Internet. Such a system is vulnerable to eavesdropping. First Virtual achieves some protection by asking the payer for an acknowledgment of each payment via email, but the actual security of the system is based on the payer's ability to revoke each payment within a certain period. In other words, there is no definite authorization during payment. Until the end of this period, the payee assumes the entire risk.

- ***Generic payment switch*** A payment switch is an online payment system that implements both the prepaid and pay-later models, as exemplified by the OpenMarket payment switch. OpenMarket's architecture supports several authentication methods, depending on the payment method chosen. The methods range from simple, unprotected PIN-based authentication to challenge-response-based systems, in which the response is computed, typically by a smart card. Actually, OpenMarket uses passwords and optionally two types of devices for response generation: Secure Net Key and SecureID. User authentication therefore is based on shared-key cryptography. However, authorization is based on public-key cryptography: the OpenMarket payment switch digitally signs an authorization message, which is forwarded to the payee. The payment switch is completely trusted by users who use shared-key cryptography.
- ***Shared-key cryptography*** Authentication based on shared-key cryptography requires that the prover (the payer) and a verifier (the issuer) both have a shared secret. A DES key is one example of a shared secret; a password and PIN are other examples. Because both sides have exactly the same secret information, shared-key cryptography does not provide nonrepudiation. If payer and issuer disagree about a payment, there is no way to decide if the payment was initiated by the payer or by an employee of the issuer. Authenticating a transfer order on the basis of shared keys is therefore not appropriate if the payer bears the risk of forged payments.<sup>4</sup> If authentication is to be done offline, each payer payee pair needs a shared secret. In practice this means that some sort of master key is

present at each payee end, to enable the payee to derive the payer's key. Tamper-resistant security modules in point-of-sale terminals protect the master key. Most offline systems (Danmont / Visa and the trial version of Mondex) and online systems (NetBill, and the 2KP variant of iKP) use a shared secret between payer and issuer for authentication.

- **Public-key digital signatures** Authentication based on public-key cryptography requires that the prover have a secret signing key and a certificate for its corresponding public signature verification key. The certificate is issued by a well-known authority. Most systems now use RSA encryption, but there are several alternatives. Digital signatures can provide nonrepudiation—disputes between sender and receiver can be resolved. Digital signatures should be mandatory if the payer bears the risk of forged payments. A rather general security scheme that uses public-key signatures is Secure Socket Layer. SSL is a socketlayer communication interface that allows two parties to communicate securely over the Internet. It is not a payment technology per se, but has been proposed as a means to secure payment messages. SSL does not support nonrepudiation. Complete payment systems using public-key cryptography include e-cash, NetCash, CyberCash, the 3KP variant of iKP, and Secure Electronic Transactions (SET). The protocol ideas themselves are much older. The use of digital signatures for both online and offline payments, anonymous accounts with digitally signed transfer orders, and anonymous electronic cash were all introduced during the 1980s.
- **Payer anonymity** Payers prefer to keep their everyday payment activities private. Certainly they do not want unrelated third parties to observe and track their payments. Often, they prefer the payees (shops, publishers, and the like) and in some cases even banks to be incapable of observing and tracking their payments. Some payment systems provide payer anonymity and un-traceability. Both are considered useful for cash-like payments since cash is also anonymous and untraceable. Whereas anonymity simply means that the payer's identity is not

used in payments, un-traceability means that, in addition, two different payments by the same payer cannot be linked. By encrypting all flows between payer and payee, all payment systems could be made untraceable by outsiders. Payer anonymity with respect to the payee can be achieved by using pseudonyms instead of real identities. Some electronic payment systems are designed to provide anonymity or even un-traceability with respect to the payee (iKP, for example, offers this as an option). Currently, the only payment systems mentioned here that provide anonymity and un-traceability against payee and issuer are e-cash (online) and CAFE (offline). Both are based on public-key cryptography, a special form of signatures called blind signatures. A blind signature on some message is made in such a way that the signer does not know the exact content of the message. DigiCash's e-cash, which is also based on the concept of blind signatures, is a cash-like payment system providing high levels of anonymity and un-traceability. In an e-cash system, users can withdraw e-cash coins from a bank and use them to pay other users. Each e-cash coin has a serial number. To withdraw e-cash coins, a user prepares a "blank coin" that has a randomly generated serial number, blinds it, and sends it to the bank. If the user is authorized to withdraw the specified amount of e-cash, the bank signs the blind coin and returns it to the user. The user then unblinds it to extract the signed coin. The signed coin can now be used to pay any other e-cash user. When a payee deposits an e-cash coin, the bank records its serial number to prevent double-spending. However, because the bank cannot see the serial number when it signs the coin, it cannot relate the deposited coin to the earlier withdrawal by the payer. NetCash and anonymous credit cards also provide anonymity and un-traceability. But they are based on the use of trusted "mixes" that change electronic money of one representation into another representation, without revealing the relation. Neither e-cash nor CAFÉ assume the existence of such trusted third parties.

## **5.5 ELECTRONIC PAYMENTS AND PROTOCOLS**

There are many protocols that are currently employed to allow money to change hands in cyberspace. But the most important open protocols used for payments on the Web are SSL/TLS, SET, and IOTP.

## SSL and TLS

The Secure Sockets Layer (SSL) protocol was designed by Netscape as a method for secure client-server communications over the Internet. Using public key cryptography and certificates, SSL offers a mechanism so that clients and servers can authenticate each other and then engage in secure communication. During an initial handshaking phase, the client and server select a secret key crypto scheme to use and then the client sends the secret key to the server using the server's public key from the server's certificate. From that point on, the information exchanged between the client and server is encrypted.

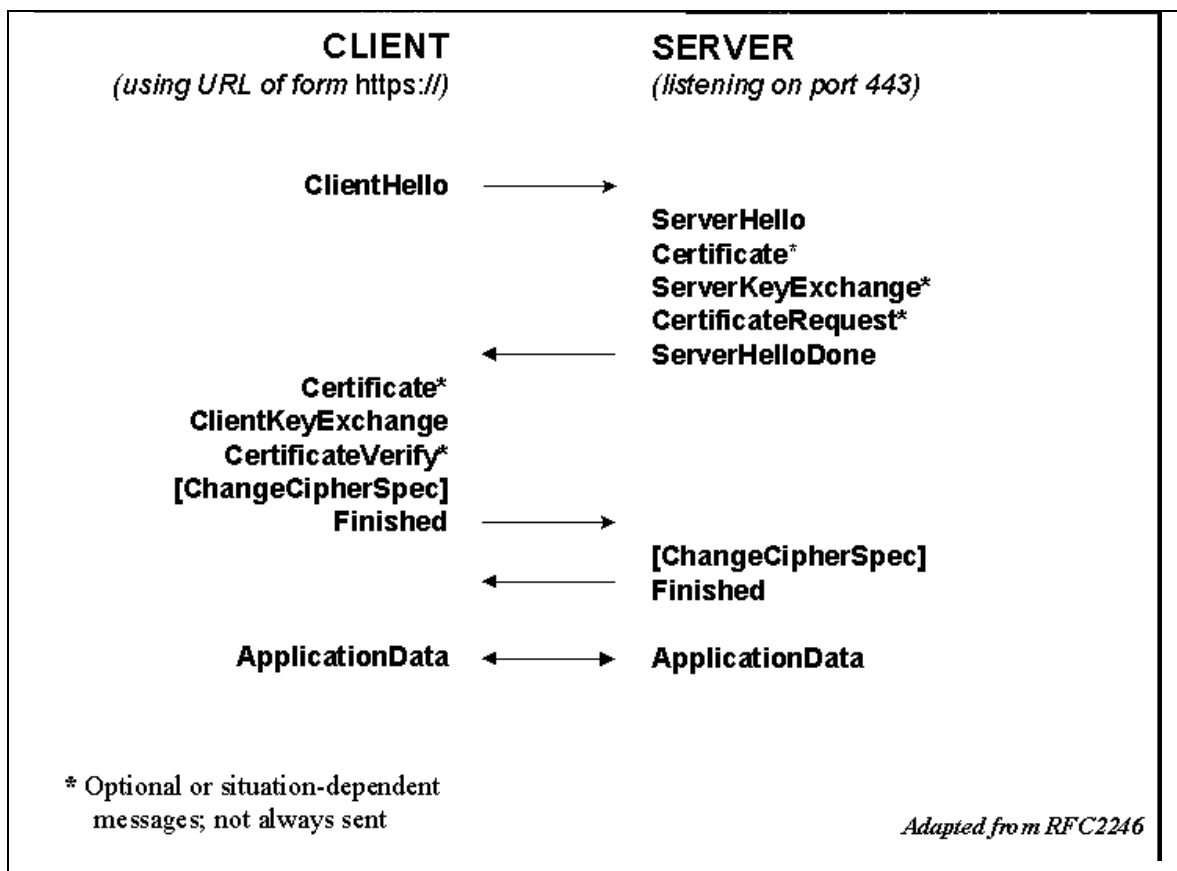


FIGURE 5.5: SSL/TLS messages exchanged between client and server.

SSL/TLS is an intermediate protocol layer that sits between TCP and a higher-layer application. SSL/TLS can be employed by any application layer protocol running over the Transmission Control Protocol (TCP), including Hypertext Transfer Protocol (HTTP), File Transfer Protocol (FTP), Telnet, and the e-mail protocols (Simple Mail Transfer Protocol — SMTP, Post Office Protocol — POP3, and Internet Message Access Protocol — IMAP4). Indeed, the most widely known and widely used application of SSL/TLS is for securing HTTP communication, denoted by the https:// in URLs and use of TCP port 443.

At its heart, SSL/TLS is not a payment protocol at all. SSL's goal is to provide a secure connection between two parties and its application for electronic commerce is to provide a secure communications channel over which a customer and business can exchange private information. In fact, the processing of payments - such as the seller obtaining credit card approval - continues to use the same mechanisms that are employed today by businesses, such as the use of a private business-to-bank network or use of card swipe machines at the business.

Secure communications in SSL/TLS relies on secret key cryptography (SKC) to ensure privacy and public key cryptography (PKC) for key exchange and authentication. The exact SKC and PKC algorithms, as well as key sizes, are negotiated on a per-session basis between the client and server. In general, the client tells the server what crypto algorithms it can support and lists them in preference order; the server selects the crypto scheme that it supports that is highest on the client's list. The client then creates an SKC session key and sends it to the server.

One of the criticisms and concerns about SSL/TLS is that only the server provides a certificate for authentication prior to securing the communication channel. The buyer is authenticated when the seller checks the buyer's credit card and determines that it is valid, but this takes place after the communication channel is secured. The risk, of course, is that the credit card could be stolen and then used by the thief to make on-line purchases. Use of a client-side certificate would make this much more difficult.

As the SSL/TLS protocol handshaking in Figure 5.1 shows, however, the protocol provides the messages and procedures so that a certificate could be provided by both client and server. This feature is not widely used today largely because the market hasn't demanded it. Recall that prior to the introduction of SSL in the mid-1990s, many people were actually conducting business by sending credit card information in unencrypted e-mails. To require users to obtain certificates for secure transactions would have been a serious impediment to e-commerce due to the relative lack of sophistication of most users and the lack of a user-oriented certificate mechanism. In any case, users today either appear to be willing to accept the risks associated with not having a client certificate in exchange for the convenience, or they are unaware of the risks and have not demanded something different.

TLS continues the evolution started by SSL. Market acceptance and user confidence in the protocol is extremely high and its use will clearly continue. It is worth noting that SSL/TLS is sufficiently secure for the vast majority of consumers who use it today to guard everything from credit card transactions and electronic banking to voting their proxy shares and applying to college. Furthermore, we don't hear about attackers stealing users' credit card numbers by grabbing packets off of the Internet and breaking the encryption; the attackers instead break into the server and grab tens of thousands of unencrypted credit card numbers!

TLS is also the basis for the Wireless Application Protocol (WAP) Forum's Wireless TLS (WTLS) specification. WTLS is functionally similar to TLS 1.0 and provides authentication, privacy, and data integrity between two applications communicating over a wireless network. WTLS is optimized for the relatively low bandwidth and high latency characteristics of this environment by incorporating such additional features as datagram support, streamlined protocol handshaking, and dynamic key refreshing.

## **SET**

Despite SSL's popularity, MasterCard, Visa, and several other companies developed the Secure Electronic Transaction (SET) protocol specifically to handle electronic payments. SET version 1.0 was released in May 1997. Today, interoperability testing is in full swing-many products, such as Cybercash's popular merchant software, are already SET compliant.

Fraud prevention is a primary motivator behind SET. Visa and Mastercard claim that online credit card frauds closely track offline rates, which they estimate to be less than one-tenth of one percent. That would seem to indicate that the current model of using SSL to protect transactions is adequate. However, some recent studies have suggested that merchants are experiencing fraud rates as high as 40% in certain segments of the electronic marketplace-items such as airline tickets, computers, and downloadable software carry the greatest risk. SET has the potential to reduce the chance of fraud by providing rigorous authentication measures in addition to encrypting transactions.

The SET approach to cryptography is similar to SSL's, employing a combination of the DES secret key and RSA public key schemes. A unique facet of SET's RSA implementation is that participants use two public/private key pairs: one for key exchange and another for digital signatures. Digital certificates form the basis of SET security. In addition to merchants possessing server-side certificates, customers are required to obtain certificates so that their identities as legitimate cardholders can be verified. Payment gateways interfacing between the Internet merchant and the traditional payment network are also required to have certificates.

One of the biggest differences between SET and SSL is in scope. SET has several components which communicate securely end-to-end across the Internet. Cardholders interact with merchants who process order information and pass payment information to payment gateways. In contrast, SSL is essentially point-to-point between buyer and seller, and makes no explicit provisions for involving financial institutions.



SET only appears on the scene at the end of a purchase. All cryptographic schemes add processing delay, so product selections are generally made without encryption to improve performance, while registration, ordering, and other interactions involving personal information take place using another secure protocol such as SSL.

After completing the order process, the customer clicks a button on the website's payment page to activate a wallet application. A reference number is generated by the merchant software and sent to the customer software along with a summary of the order. The cardholder selects the appropriate credit card in the digital wallet and clicks on a payment button, invoking SET and beginning the payment process. An exchange of SET messages over the Internet-between the cardholder and the merchant, and between the merchant and the payment gateway-completes the transaction. Connections between the payment gateway and banks use the existing payment network, and are thus not part of the SET specification.

SET provides a high degree of privacy for customers by encrypting payment information so that only the bank can see it. Customer software sends a purchase request to the merchant containing the following (Figure 5.6): unencrypted order information and a dual signature, intended for the merchant; payment instructions and a dual signature, both encrypted and intended for the payment gateway; and the cardholder's digital certificate to be used by the merchant and the payment gateway for authentication. Lacking the payment gateway's private key, the e-commerce site can only read the order information. The merchant passes payment instructions in an authorization request to the gateway. SET, then, eliminates the merchant as a vulnerability in the credit card chain; because the merchant does not require access to the credit card account information, it is neither processed nor stored in their databases!



**FIGURE 5. 6: SET Purchase Request.**

The order details and the account information are unequivocally associated through a “dual signature” mechanism. The SET client software first combines a hash of the order information with a hash of the payment instructions. The result is then hashed, thus linking the order and payment together such that nobody can deny the bond. This second hash value is signed by encrypting it with the customer’s secret key, tying the customer to the purchase.

The greatest weakness is on the consumer side. For SET to be of any real security benefit, end user authentication has to be a part of the transaction. However, requiring the average surfer to obtain a certificate is a dicey proposition, partially proven by the continued use of SSL and server-only authentication. To promote migration, there are provisions to allow for optional customer certificates in the short-term. Generating certificates involves new user behavior, potentially complicating the customer's shopping experience and thereby discouraging purchases. To promote adoption of SET, the specification allows for optional customer certificates-whether to require them is at the card issuer's discretion.

### **IOTP**

Whereas SSL is a secure communications protocol that can be used by a consumer to forward payment information and SET is a protocol specifically designed for credit card transactions, the Internet Open Trading Protocol (IOTP) provides an interoperable framework for consumer-to-business Internet-based electronic commerce. As a commerce framework specification, IOTP is designed to replicate the "real" world of transactions where consumers choose their product, choose their vendor, choose their form of payment (in conjunction with their vendor), arrange delivery, and, periodically, even return products. The designers of IOTP intend that this protocol will be the lingua franca of Internet commerce just as EDI has become the standard document language for "real" commerce; any two parties conducting Internet-based e-commerce in a way that conforms to the IOTP specifications will be able to complete their transactions securely.

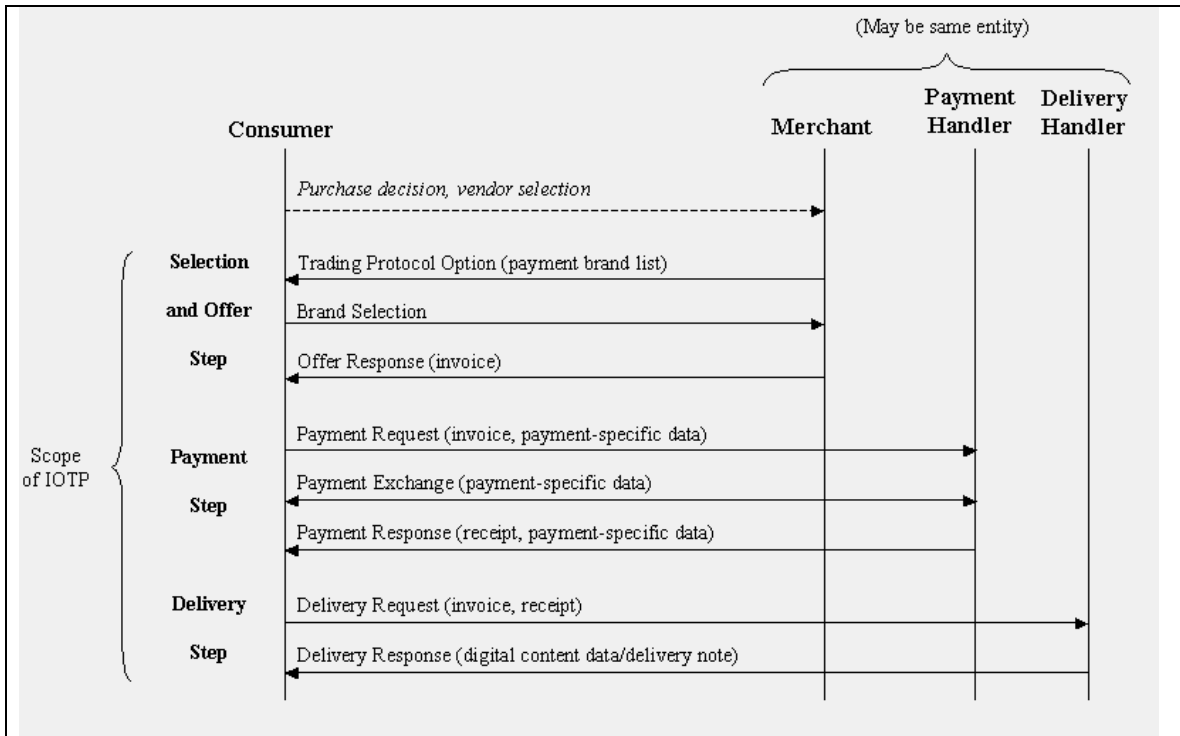


FIGURE 5.7: The flow of IOTP messages clearly indicates that the protocol can support the entire shopping process and all parties to buying, selling, paying, and delivering products and goods.

Figure 5.7 shows the general flow of an IOTP-based purchase. Note that it might be more proper to refer to IOTP as a shopping protocol rather than a payment protocol since it attempts to capture the entire online shopping cycle and shopping is more than merely paying for stuff. And just as you might wander through the stores of a new mall in the real world, IOTP is optimized for those cases where the buyer and merchant do not have an a priori relationship.

The Selection and Offer step is a particularly good example of mapping e-commerce to realspace. In this step, the user selects amongst payment mechanisms the way they might in a "real" store. I might select a credit card, for example, because of an award that I may get for using the card or perhaps because of a discount offer made by the store. Alternatively, I may use one currency over another for some other perceived benefits. IOTP maintains payment-system independence and can be used to encapsulate and

support payment systems such as CyberCoin, e-cash, GeldKarte, MilliCent, Mondex, SET, and others. Note also that IOTP procedures can be employed by the customer for communication with the merchant, payment handler, and shipper which may be one, two, or three different entities.

But while IOTP will support the familiar models of business that we have today, it also has to support the new models that only the Internet has made viable. Individual very low-value transactions don't even exist in the real world because they use currency that doesn't "exist"! New product delivery models will also appear. Consider today's Internet market where the value of a product might be irretrievably transferred to the customer upon downloading a file; in this case, an item must be proved delivered before payment is rendered but payment must be forthcoming upon delivery and nonrefundable.

Clearly, cryptography is an important part of the security associated with IOTP. Although IOTP does not call out for specific algorithms, it does provide the flexibility that any given transaction may employ symmetric (secret key), asymmetric (public key), or both types of crypto schemes. Furthermore, depending upon transaction type, digital certificates may or may not be employed. Again, the overhead and cost of the security must be balanced with the needs of the buyer and the seller on a per-transaction basis. Use of XML (eXtensible Markup Language) as the data representation language provides flexibility and extensibility, and facilitates the development of a broad range of IOTP-aware applications.

## **5.6 SECURITY REQUIREMENTS IN ELECTRONIC PAYMENT SYSTEMS**

The concrete security requirements of electronic payment systems vary, depending both on their features and the trust assumptions placed on their operation. In general, however, electronic payment systems must exhibit integrity, authorization, confidentiality, availability, and reliability.

### ***Integrity and authorization***

A payment system with integrity allows no money to be taken from a user without explicit authorization by that user. It may also disallow the receipt of payment without explicit consent, to prevent occurrences of things like unsolicited bribery. Authorization constitutes the most important relationship in a payment system. Payment can be authorized in three ways: via out-band authorization, passwords, and signature.

### ***Out-band authorization***

In this approach, the verifying party (typically a bank) notifies the authorizing party (the payer) of a transaction. The authorizing party is required to approve or deny the payment using a secure, out-band channel (such as via surface mail or the phone). This is the current approach for credit cards involving mail orders and telephone orders: Anyone who knows a user's credit card data can initiate transactions, and the legitimate user must check the statement and actively complain about unauthorized transactions. If the user does not complain within a certain time (usually 90 days), the transaction is considered "approved" by default.

### ***Password authorization***

A transaction protected by a password requires that every message from the authorizing party include a cryptographic check value. The check value is computed using a secret known only to the authorizing and verifying parties. This secret can be a personal identification number, a password, or any form of shared secret. In addition, shared secrets that are short - like a six-digit PIN - are inherently susceptible to various kinds of attacks. They cannot by themselves provide a high degree of security. They should only be used to control access to a physical token like a smart card (or a wallet) that performs the actual authorization using secure cryptographic mechanisms, such as digital signatures.

### ***Signature authorization***

In this type of transaction, the verifying party requires a digital signature of the authorizing party. Digital signatures provide nonrepudiation of origin: Only the owner of

the secret signing key can “sign” messages (whereas everybody who knows the corresponding public verification key can verify the authenticity of signatures.)

### ***Confidentiality***

Some parties involved may wish confidentiality of transactions. Confidentiality in this context means the restriction of the knowledge about various pieces of information related to a transaction: the identity of payer/payee, purchase content, amount, and so on. Typically, the confidentiality requirement dictates that this information be restricted only to the participants involved. Where anonymity or un-traceability are desired, the requirement may be to limit this knowledge to certain subsets of the participants only, as described later.

### ***Availability and reliability***

All parties require the ability to make or receive payments whenever necessary. Payment transactions must be atomic: They occur entirely or not at all, but they never hang in an unknown or inconsistent state. No payer would accept a loss of money (not a significant amount, in any case) due to a network or system crash. Availability and reliability presume that the underlying networking services and all software and hardware components are sufficiently dependable. Recovery from crash failures requires some sort of stable storage at all parties and specific resynchronization protocols. These fault tolerance issues are not discussed here, because most payment systems do not address them explicitly.

## **5.7 ELECTRONIC PAYMENTS AND CONSUMER EMPOWERMENT**

Electronic payments empower the consumer in several fundamental ways that cash and cheques cannot. One of the clearest ways is the security that dispute resolution provides, offering consumers a form of insurance against purchases of faulty goods or services that are not delivered or lower in quality than expected. Insurance against lost, stolen or otherwise unauthorized use allows consumers to quickly shield themselves from liability, at zero cost in some markets, unlike lost cash or cheques. Electronic payments also provide the ability to control payment for goods and services over time by allowing

buyers to pay now, pay later, or prepay. Credit cards provide liquidity through pre-approved credit availability, something that transaction-specific loans cannot do. This works favorably for consumers, merchants, and banks because the process facilitates current period sales while minimising the cost of obtaining credit. Debit cards offer convenient and immediate access to funds on deposit. Globally branded electronic payments have the ubiquitous and interoperable features that lend themselves to immediate acceptability by consumers and businesses. Despite the value that consumers place on electronic payments, and the benefits that extend to economies from the underlying system, concerns are sometimes raised about abuse of credit and erosion of consumer wealth. Often these concerns are raised in the context of new regulations that would raise barriers to consumer access to credit and are based on an implicit assertion that expanded credit availability and use produces widespread harm to consumers. However, with the application of an objective analysis quite a different picture emerges. An in-depth study of consumer behavior in Australia provides some insights into the level and sophistication of payment usage and clearly shows that consumers have a high level of understanding of payments and responsibly manage revolving credit.

## **5.8 DESIRABLE PROPERTIES OF DIGITAL CURRENCY**

Developers of digital currency have a wide range of options to implement strong safety requirements of transmitting values over the network. For example, a secure digital currency can be implemented by using strong encryption algorithms, by employing tamper-resistant hardware, or by securing the network communication. Although physical specifications of digital coins and tokens may vary, the following properties are fundamental to any digital currency payment system.

- ***Monetary Value*** To be used as a monetary unit, digital currency must have value that can be exchanged for other goods and services, be used to pay fiduciary obligations, or be transferred to another person. Since digital currency is essentially a file, it does not have an intrinsic value, but must be linked to other system of value. The most common implementation is to base the value of digital currency on bank deposits, credits, or prepayments using outside money. Once a



digital currency is convertible to dollars, the next step is for it to be accepted in the market as a monetary token. Once accepted and trusted, a digital currency can establish related properties such as exchangeability and transferability.

- **Convenience** Convenience has been the biggest factor in the growth of notational currencies such as checks, which are scalable and easy to transport. Similarly, digital currencies must be convenient to use, store, access, and transport. As a digital file, it may allow remote access to money via telephone, modem, or Internet connection. Electronic storage and transfer devices or network capabilities will be needed. To gain wide acceptance, digital cash also must be convenient in terms of scalability and interoperability so that users need not carry multiple denominations or multiple versions for each operating system.
- **Security** To secure physical money and coins, one needs to store them in wallets, safes or other private places. If digital currencies are stored in hard drives connected to an open network, theoretically anybody can snoop and tamper with the money. Encryption is used to protect digital currency against tampering. Some proposals using smart cards, e.g. Mondex, store digital currency in tamper-resistant hardware that can be maintained offline. Ecash relies on the security of Eeach client software residing on users' computers. At the same time, digital currencies must be resistant to accidents by owners. Rupee bills are printed on strong paper that withstands many adverse treatments, such as washing. To achieve similar security, adequate protection standards are needed both in physical specifications of digital coins and in policy matters for legal and commercial liabilities.
- **Authentication** Authentication of money is done by visually inspecting bills and coins. Although further tests could weighing, chemical analysis, and contacting the authorities, authentication is usually a simple matter for physical currency. Digital currency, however, cannot be visually inspected, and it is difficult to distinguish the original and a counterfeit. Because of this, inspection of digital

currency depends on authenticating secondary information that accompanies the bills or coins such as the digital signatures of banks or payers attached to the currency (serial number). A more rigid system will require contacting a third party each time a transaction is made. Although this system is more secure, the transaction costs may be too high for small-value purchases. A hardware based system like Mondex relies on software and hardware and does not require authentication for each transfer of values. Other systems will have to strengthen their client software or introduce hardware protection to allow peer-to-peer transactions.

- ***Non-refutability*** Acknowledging payment and receipt is a basic property required of a payment system. In cash transactions, simple receipt is enough to establish non-refutability. A similar exchange of digital receipts can be used for digital transactions. An alternative is to append all transaction records into the digital currency itself. In this system, digital coins accumulate information about all parties involved in past transactions. These are called identified tokens compared to anonymous tokens, which do not reveal information about users.
- ***Accessibility and Reliability*** One advantage of digital currency over cash is its capability to be transported over the network. Therefore, users can store digital money at home but access it remotely via telephone or modem, the same network used to clear payments. Because of this crucial role, digital payment systems must provide continuous, fast, and reliable connections.
- ***Anonymity*** Unlike checks and cards, cash transactions are anonymous. An anonymous payment system is needed to protect against revealing purchase patterns and other consumer information, although untraceable transactions are opposed by the government in view of possible criminal uses. Nevertheless, the need will persist, and anonymity is perhaps the single most important property of cash transactions. Digital currency can be equipped with varying degree of anonymity masking the user identity to the bank, the payee, or both. Strong

anonymity guarantees un-traceability while a weaker version allows the user's identity to be traced when the need arises. While the issue of anonymity invokes debates about tax evasion, money laundering and other criminal uses of digital currency, the economic rationale for simple, anonymous digital coins is that they reduce transaction costs by eliminating third parties and protect consumer information that could be used to price-discriminate among consumers.

## **5.9 PROSPECTS OF ELECTRONIC PAYMENT SYSTEMS**

As the volume of Electronic Commerce becomes larger, the role of secure and economical online payments on the Internet will, accordingly, become more important. At the moment, the credit card payment for B2C trades with SSL protocol is the most widely adopted. However, SET protocol tailored to credit card payment may become one of the next generation standards. For micro payment, smart-card-based e-cash will become popular and will be recharged through the Internet from the cyber-banks, which will revitalize the benefit of cyber-banks.

As B2B occupies the major portion of Electronic Commerce, more economical payment methods like Internet-based funds transfer equipped with the benefit of check systems will become the major medium for large-amount payments. The credit card fee seems too high to transfer large amounts among credible corporations. This prospective trend should envision opportunities to payment businesses and corporate finance managers.

## **5.10 MANAGERIAL ISSUES IN ELECTRONIC PAYMENT SYSTEMS**

Managerial issues for electronic payment systems vary depending upon the business position.

- *Security solution providers* can cultivate the opportunity of providing solutions for secure electronic payment systems. Typical ones include authentication, encryption, integrity, and nonrepudiation.
- *Electronic payment systems solution providers* can offer various types of

electronic payment systems to e-stores and banks. The SET solution of having the certificate on the smart card is an emerging issue to be resolved.

- **Electronic stores** should select an appropriate set of electronic payment systems. Until electronic payment methods become popular among customers, it is necessary to offer traditional payment methods as well.
- **Banks** need to develop cyber-banks compatible with the various electronic payment systems (credit card, debit card, stored-value card, and e-check) that will be used by customers at e-stores. Watch for the development of consistent standards in certificates and stored-value-card protocols.
- **Credit card brand companies** need to develop standards like SET and watch 'the acceptance by customers. It is necessary to balance security with efficiency. Careful attention is needed to determine when the SSL-based solution will be replaced by the SET -based solution and whether to combine the credit card with the open or closed stored-value card.
- **Smart card brands** should develop a business model in cooperation with application sectors (like transportation and pay phones) and banks. Having standards is the key to expand interoperable applications. In designing business models, it is important to consider the adequate number of smart cards from the customer's point of view.
- **Certificate authorities** need to identify all types of certificates to be provided. Banks and credit card companies need to consider whether they should become a clearing agent.

## **5.11 ELECTRONIC PAYMENT SYSTEM IN INDIA**

The primary goal of any national payment system is to enable the circulation of money in its economy. It is recognized world wide that an efficient and secure payment system is

an enabler of economic activity. It provides the conduit essential for effecting payments and transmission of monetary policy. Payment systems have encountered many challenges and are constantly adapting to the rapidly changing payments landscape. More recently, the proliferation of electronic payment mechanisms, the increase in the number of players in the financial arena and the payment crises in quite a few countries and regions in the 1990s have focused attention on public policy issues related to the organisation and operation of payment systems. Three main areas of public policy have guided payments system development and reform: protecting the rights of users of payment systems, enhancing efficiency and competition, and ensuring a safe, secure and sound payments system.

Electronic commerce and finance are growing rapidly. New payments mechanisms designed to aid electronic commerce have become routine. Predictions abound about the capabilities of the information and communication technology to bring forth important tools for conducting electronic commerce and payments. We are in the midst of a wave of innovation and change.

In a dynamic economy, markets need to play a key role in guiding the development of infrastructure, including mechanisms like payments systems. This means that innovation and competition will be central to the future development of the payments system - as they are in other areas of the economy. Strategic planning and investments by market participants will be shaped by views about the future. Public policy should assist them in shaping their views by pronouncing its vision and intentions clearly and well in advance so that the market participants can face the challenges and take advantage of opportunities. This Vision helps in charting out a course to purposeful and orderly change.

For such policy pronouncements, a country can opt for a strategic approach, where the state of the payment system is established, its weaknesses and strengths determined and a way forward charted, giving due regard to the country's environment and the strategic direction of the payment technologies and practices. This approach enables one to have a

holistic vision of the entire payment system, and leads to the development of a Strategic Implementation Plan that is well structured, appropriately phased, properly sequenced and convergent in perspective.

India adopted this approach in the year 2001 when it came out with its “Payment Systems – Vision Document” with four major components. These are Safety, Security, Soundness and Efficiency. Called the ‘**Triple-S + E**’ principle in short, each of the principles, which have a synergistic inter-relationship, would specifically address the following:

- ❖ **Safety** will relate to addressing risk, so as to make the systems risk free or with minimal risk
- ❖ **Security** will address the issues relating to confidence, with specific reference to the users of these systems
- ❖ **Soundness** will be aimed at ensuring that the systems are built on strong edifices and that they stand the test of time
- ❖ **Efficiency** will represent the measures aimed at efficiencies in terms of costs so as to provide optimal and cost effective solutions.

### **Current Status**

There are diverse payment systems functioning in the country, ranging from the paper based systems where the instruments are physically exchanged and settlements worked out manually to the most sophisticated electronic fund transfer system which are fully secured and settle transactions on a gross, real time basis. They cater to both low value retail payments and large value payments relating to the settlement of inter-bank money market, Government securities and forex transactions.

The retail payment systems in the country comprise both paper based as well as electronic based systems. They typically handle transactions which are low in value, but very large in number, relating to individuals firms and corporates. These transactions relate mainly to settlement of obligations arising from purchase of goods and services. In India there are about 1050 cheques clearing houses. These clearing houses clear and settle

transactions relating to various types of paper based instruments like cheques, drafts, payment orders, interest / dividend warrants, etc. In 40 of these clearing houses, cheque processing centres (CPCs) using MICR technology have been set up. At 14 more clearing houses, MICR cheque processing systems are proposed to be set up. The clearing houses at 16 places including the 4 metros are managed by the Reserve Bank which also functions as the settlement banker at these places. In other places the clearing houses are managed by the State Bank of India and certain other public sector banks and the settlement bank functions are also performed by the respective banks. The clearing houses are voluntary bodies set up by the participating banks and post offices and they function in an autonomous manner. The Reserve Bank has issued the Uniform Regulations and Rules for Bankers' Clearing Houses (URRBCH) which have been adopted by all the clearing houses. These regulations and rules relate to the criteria for membership / sub-membership, withdrawal / removal / suspension from membership and the procedures for conducting of clearing as well as settlement of claims between members.

There are various types of electronic clearing systems functioning in the retail payments area in the country. Electronic Clearing System (ECS), both for Credit and Debit operations, functions from 46 places (15 managed by Reserve Bank and the rest by the State Bank of India and one by State Bank of Indore). The ECS is the Indian version of the Automated Clearing Houses (ACH) for catering to bulk payments. The Electronic Funds Transfer (EFT) System is operated by the Reserve Bank at 15 places. This is typically for individual / single payments. These systems are governed by their own respective rules. A variant of the EFT, called the Special Electronic Funds Transfer (SEFT) System is also operated by the Reserve Bank to provide nation-wide coverage for EFT. All these electronic fund transfer systems settle on deferred net settlement basis.

There are a few large value payment systems functioning in the country. These are the Inter-Bank Cheques Clearing Systems (the Inter-bank Clearing), the High Value Cheques Clearing System (the High Value Clearing), the Government Securities Clearing System (the G-Sec Clearing), the Foreign Exchange Clearing System (the Forex Clearing) and

the Real Time Gross Settlement (RTGS) System. All these systems except the High Value Clearings are electronic based systems. These mostly relate to inter-bank / inter-financial institutional transactions except the High Value Clearing where high value customer cheques are cleared. The Inter-bank Clearing functions in 7 places and the High Value Clearing in 15 places - both are managed by the Reserve Bank. The G-Sec Clearing and the Forex Clearing are managed by the Clearing Corporation of India Limited (CCIL). The RTGS System is operated by the Reserve Bank. All these are deemed to be Systemically Important Payment Systems (SIPS) and therefore the Reserve Bank has, in line with the international best practices in this regard, moved them (except the Inter-bank Clearings at places other than Mumbai and the High Value Clearings) to either secure and guaranteed systems or the RTGS System.

## **5.12 FUTURE OF ELECTRONIC PAYMENTS SYSTEMS**

The critical reasons in acceptance of electronic payment instruments and their niche in the payments environment are:

1. The cost savings are substantial, and businesses and consumers will not be able to ignore that fact once other issues are resolved.
2. The exponential growth of electronic commerce, online financial services, electronic bill presentment and payment products, and new financial communication networks will demand greater velocity in the movement of value which are efficient and instantaneous.
3. The proliferation of business-to-business ("B2B") electronic commerce will force payments systems to adapt to even greater speeds and standards of efficiency.
4. The adults of the future will not be wed to bricks and mortar, checkbooks or passbooks or even ATM cards.

But we should not be fooled into thinking that 21st century electronic payments products will totally replace checks, credit and debit cards, or cash. They will simply find their niche in the financial products landscape like very other product did in the 20th century.



### ***Legal Considerations***

There are a variety of policy, operational and legal considerations confronting any entrepreneur who attempts to tackle the challenge of creating a new form of value or a new way to transmit it. Because most current banking and payments systems laws and regulations have been constructed to deal with more traditional payment mechanisms, they often do not provide a clear picture of whether and how they apply to new payment vehicles or systems. That creates a sense of uncertainty that is not helpful to developing markets. If the government does anything in the near future, it should foster legal predictability in this area.

### ***Jurisdictional Considerations***

Money and payments systems are by their very nature, multi-jurisdictional products. If there is one thing that is meant to be in commerce, it is money. Thus the creation of new global electronic payment instruments and systems raises a threshold issue. Whose laws apply? While today, there is a well worn path of understanding regarding the application of check clearing, ACH, credit card, FedWire and other traditional payments systems rules, the development of new forms of money and new payments systems that are based in Cyberspace necessarily raise jurisdictional questions. Which state or country will regulate the activities of the entity or the movement of the electronic value it creates?

### ***State Banking Laws***

The creation of a new electronic payment product raises the possibility that it may unknowingly conflict with banking laws in the states. To the extent that a non-bank creates a payment product that is linked to an “account,” that entity may be engaging in the business of banking without a license under state law. It may also have established an illegal deposit relationship with its customers that subjects it to criminal penalties under federal law. .

### ***Who Should Facilitate Electronic Payments?***

In a similar vein, there are intriguing legal, regulatory and policy questions that must be answered when it comes to the question of who may mint, distribute, circulate and

transmit electronic payments? While most systems really aren't creating money in the technical legal sense, in the economic and practical sense, they may be. If the medium of exchange is trusted and the scale of acceptability is large, several critical questions arise:

1. Do electronic payment products affect the money supply?
2. Should non-regulated companies be permitted to mint, distribute, circulate and transmit electronic money?
3. What protections should be constructed to deal with the failure of companies that create, distribute or clear electronic money and liquidity crises in the resulting electronic payments markets?
4. How should new electronic payments systems be protected, regulated and made safe and secure?
5. Who provides the ultimate liquidity and stability that makes these new money and payments systems work?

Most governments do not generally allow anyone but governmental entities to create money. While private entities are able to create and distribute substitute money products such as travelers checks, generally, they are viewed as special purpose instruments and are not used in the same frequency, volume or scale as traditional money. Indeed, if one form of electronic money offered by a private company or consortium of companies, became ubiquitous, there would be economic downsides to consider alongside the economic benefits it might confer. For example, if most Americans used electronic money on smart cards, any hint that the sponsor of the system was in financial difficulty or that the security of the system had been broken could result in a "run" on that form of money. Merchants might refuse to accept the card. Card holders would rapidly retreat to the bank whose name was co-branded on the smart card and demand "real money" in exchange for their electronic money. If on the way to their bank, they passed an off-line vending machine that accepted the card, they might use it to purchase a car load of sodas to wipe out the value on the card, thus shifting the risk of loss to the owner of the vending machine. While regulators are well equipped to handle bank failures, the collapse of a form of currency is another matter altogether.

Similarly, the emerging area of electronic bill payment and presentment raises new issues for payments systems. Today, a growing number of consumers pay their bills electronically (electronic bill payment) without writing a check, finding an envelope or licking a stamp. They may also receive their bills electronically (electronic bill presentment) without ever receiving a paper bill in the mail. This system potentially offers enormous cost savings to both consumers and billers. Yet, it also raises new issues as to who bears responsibility should payments not be made. As the system has evolved to date, the third party processors that facilitate electronic bill payment and presentment, and through which a consumer's funds may travel, typically are not insured financial institutions. Once value leaves the insured banking system and becomes the property of such processor, even overnight, the failure of such entity raises significant financial issues for businesses and consumers, each of whom would assert a claim to the funds. In short, new products, players and systems implicate new rules of management and risk.

### **5.13 SUMMARY**

Although there is a plethora of disparate payment systems offered for electronic commerce, many firms are reluctant to expand into online commerce because of the perceived lack of suitable payment mechanisms. Widely different technical specifications make it difficult to choose an appropriate payment method. In this chapter, instead of focusing on the technical specifications of proposed electronic payment systems, we have distinguished electronic payment methods based on what is being transmitted over the network. Since consumers are familiar with credit card payment methods, they may accept its electronic versions as the standard for electronic commerce. Nevertheless, Web-based information trading cannot be adequately supported by existing payment methods that have been developed for relatively high-value transactions. A cost effective micropayment system is essential for transactions of extremely small value just as cash is still the preferred payment method for these transactions. Anonymity is only one aspect of cash transaction but it has received a disproportionate, often sensational, attention in the press and by regulatory agencies while the economic need for a cash-like payment system in electronic commerce is largely ignored. Factors such as micropayments and peer-to-peer transfers in electronic commerce-especially for the information market-seem

to indicate a healthy market for digital currency or small-value digital checks or credit cards. In terms of the regulatory and monetary impact, private digital monies clearly present both problems and opportunities. But, as with any digital product, the future of digital currency will be determined by the market demand and supply. Consequently, it is more than likely that each of the payment methods we reviewed will find a niche market and consumers will selectively use an appropriate payment method depending on whether one prefers convenience, costs, privacy, or the advantage of credit extension. The usefulness of digital currency, however, has to be emphasized in terms of what the Web-based information economy would mean for the future of electronic commerce and the Internet. With a suitable payment method, the age of information will manifest itself on the Internet, albeit in a commercial form.

#### **5.14 KEYWORDS**

**EPS:** Electronic Payment System, the payment mechanism adopted on internet

**ACH:** Automated Clearing House, a clearing house on internet

**EFT:** Electronic Fund Transfer, Mechanism to transfer money electronically

**SET:** Secure Electronic Transaction (SET) protocol specifically designed to handle electronic payments

**SSL:** The Secure Sockets Layer (SSL) protocol is used for secure client-server communications over the Internet.

**IOTP:** Internet Open Trading Protocol (IOTP) provides an interoperable framework for consumer-to-business Internet-based electronic commerce.

#### **5.15 SELF ASSESSMENT QUESTION**

1. What are the different types of Electronic Payment Systems? Explain each of them.
2. Discuss various security issues involved in Electronic Payment Systems.
3. What is SET?
4. Explain various protocols used in making online payments.
5. If you are given the responsibility to design Electronic Payment systems, what actors will you consider the most important?

6. Differentiate between credit card and debit card.
7. “The banking industry is facing an increasing volume of cheque transaction, growing competitive pressure and shrinking profit margins.” What is the solution or this? Has India taken any lead to solve this problem and if yes, in what way?  
Differentiate between traditional payment system and electronic payment system.
8. Who Should Facilitate Electronic Payments?

#### **5.16 SUGGESTED READINGS**

- Kalakota, Ravi and Whinston, Andrew B. “Electronic Commerce – A Manager’s Guide”, Pearson Education, Inc.
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# LESSON : 6

## E-COMMERCE AND BANKING INDUSTRY

**Subject: E-Commerce**

**Paper Code: MM-409/IB-419**

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### STRUCTURE

- 6.0 Objectives
- 6.1 Introduction to Electronic Commerce and Banking
- 6.2 Changing Dynamics in the Banking Industry
- 6.3 Home Banking Implementation Approaches
- 6.4 Open versus Closed System
- 6.5 Management Issues in Online Banking
- 6.6 Summary
- 6.7 Keywords
- 6.8 Self Assessment Questions
- 6.9 Suggested Readings

### 6.0 OBJECTIVES

The motive of this chapter is to present an introduction to Electronic Commerce and Banking Industry and within that framework the key e-banking concepts, changing dynamics, implementation approaches, and management issues in the banking industry are discussed.

After going through this lesson, you will be able to:

- Describe the concept of electronic banking
- Explain the changing market structure and customer needs in banking industry.
- Differentiate between online banking and electronic banking.
- Discuss the management issues related to online banking.
- Describe some of the marketing and pricing related issues in online banking.

## **6.1 INTRODUCTION TO ELECTRONIC COMMERCE AND BANKING**

The decade of 90s has witnessed a sea change in the way of doing banking. The scenario has been improving at a very fast pace as electronic commerce (e-commerce) is receiving more and more attention in the banking industry. Technology has made a tremendous impact on this industry by reducing operating costs and also by providing adequate customer services. To some extent, the intense interest of bankers in electronic banking (e-banking) reflects a more general interest in the role of the internet as a vehicle for commercial activity. At its core, e-banking involves the collection, storage, transfer and processing of information assets and internet is an incredibly powerful and efficient tool for handling these information processes.

*'Anywhere banking'* and *'Anytime banking'* have become a reality. There is no specific online banking region to which the transactions are limited. Bookkeeping is simplified and automated and so is tax computation. Bills are paid with a minimum of effort. E-banking offers a wider outreach for banking institutions. E-banking is most useful when it saves the consumer time and money. It is particularly useful for those who have a lot of bills to pay and already use a personal financial program like Intuit's Quicken or Microsoft Money. The need for e-banking is continuously increasing as more and more consumers gain addiction to doing their banking transaction the quick and easy way. Moreover, since e-banking business is secure, many commercial concerns are also turning to doing their banking via the Internet.

E-banking makes use of electronic currency. Check cards or debit cards, smart cards or stored-value cards, digital cash and digital checks are the different types of electronic currency. If anyone uses a check card to make purchases, the funds are transferred immediately from his/her account to the company's account. Smart cards have a specific amount of credit embedded in it. The chip in the card contains both personal and financial information of the user. Digital cash is one way of allowing consumers make purchases over the Internet instead of using a credit card. Digital checks are used with electronic bill paying services. Consumers can use personal finance software packages or they can use software provided by a bank.

Loans are now marketed as products, with a number of value-added services attached to them. Banks are selling mutual funds, providing education loans, car loans, home loans, credit cards and debit cards. There have been associations with petroleum

companies, airline companies, hospitality industry, and media houses to promote products and services.

Restructuring in the banking arena is already in progress. If banks are talking anytime, anywhere service for their customers, they are changing their organizations to fit in with the new reality of making them more productive and function driven. Public sector banks are also reorienting themselves to change their profile to be able to raise fresh capital from the market.

The Internet is an extremely efficient device for banks of all sizes to collect and to manage information in order to meet the various financial needs of individuals and businesses, in particular by integrating services or “bundling” them together. On one hand, the Internet allows financial firms of different sizes to enter markets and reach customers previously out of reach to them. On the other hand, there are substantial economies of scale and scope in data storage and data processing, and larger banks are better positioned to exploit these scales and scope economies than smaller banks.

### **What is e-commerce and e-banking?**

E-commerce may broadly be defined as all the transactional commerce conducted electronically between businesses and other businesses (B2B), between businesses and their end-customers (B2C) and within an enterprise, over the internet, extranets and intranets. E-commerce or online commercial transactions has emerged as a major economic force. It is not just the purchase of goods online, but also the electronic exchange of services, including information and knowledge, such as legal advice, archival data, design and financial services. Information, its provision and access, is as critical an issue in e-commerce as it always has been in any sort of commerce. Online access is already a requirement for full social, economic and educational participation in the light of stated government and private sector goals of electronic service delivery.

Electronic banking is using electronic means to transfer funds directly from one account to another. Electronic banking is a system that enables bank customers to access accounts and general information on bank products and services through a personal computer or other intelligent device.



Some electronic banking services are ATMs, direct deposit and withdrawal services, pay by phone systems, point-of-sale transfer terminals, Web banking or PC banking services, even banking from mobile phone. Electronic banking offers consumers the convenience of accessing and transferring funds between their accounts, paying their bills and other purchases, twenty four hours a day, seven days a week.

A fully-integrated bank e-commerce system combines a powerful and flexible enterprise server with software and services that can take full advantage of already accumulated information such as consumer demographics, credit records, risk profiles and account histories to help exploit customer preferences, accelerate speed to market and improve the bottom line. Forward-looking banks are focusing on the need for e-banking, personalized data and customer service, and the highest possible network security. E-banking has had a noticeable impact on bank performance.

### **E-commerce banking – Technological benefits and barriers**

New technologies offer unprecedented levels of communication and expanding possibilities for equal information access and independent living. Digital technologies can reduce the expense and difficulty of providing information.

The barriers to e-banking may be security and privacy concerns, particularly with credit cards, shipping and delivery costs, time consuming, difficulty of finding websites/products, complexity of ordering process. Trust and accountability are the main requirements. E-banking cannot be expected to suit all users, and may present serious access barriers to some people with disabilities, but for other people it represents independence and equality.

## **6.2 CHANGING DYNAMICS IN THE BANKING INDUSTRY**

Globalization and liberalization of financial markets may have paved the way to increased access to cross-border banking, but the significant advances in electronic technology are what have accelerated access to anonymous and instantaneous cross-border banking. Even without the liberalization of financial markets, the new technologies have permitted this to occur.

With the development of technologies in the banking industry, there has been a major change in the banking system and in the way banks strive for increased profitability.

In the past, the banking industry was mainly concerned with asset quality and capitalization, but today performing well on asset quality and capitalization is not sufficient. A thorough understanding of competitive environment and the new ways to increase revenue are the basic desires of modern banks.

Following are the distinct factors contributing to the new competitive environment:

- 6.2.1. E-commerce and changing consumer needs – Absolute essentials for competitive banking
- 6.2.2. E-commerce and new technology-based banking services
- 6.2.3. Optimization of branch networks in order to reduce cost
- 6.2.4. Banking and bank regulation - Potential challenges for regulatory policy
- 6.2.5. E-commerce and trends in banking industry

#### **6.2.1. E-commerce and changing consumer needs – Absolute essentials for competitive banking**

In this changing environment, consumers' requirements are changing substantially. Now Customers want to access account related information, download account data for use with personal finance software products, transfer funds between accounts, and pay bills electronically. The bank must be able to safeguard customer information and personal privacy. Consolidation of the banking industry and the expanding scope of products offered by financial service firms means that the industry will be responsible for maintaining and safeguarding huge databases containing extensive information on individuals.

In such an intensely competitive networked banking marketplace, the demands of e-commerce go far beyond simple interconnection. Competitive demands have made clear the need for banks to stay at the cutting edge of e-commerce technology so that they can provide high levels of service all the time, anywhere, over any communications channel. Banks need e-commerce systems that are integrated with the entire chain of back office and business decision processes for optimum flexibility, responsiveness to changing market requirements, and profitability. Now is the time for advanced e-commerce as no one want to be left behind by its traditional

and new competitors. E-banking can meet the customers' changing needs and a broad range of banking requirements by having:

- Available 24 hours a day, 7 days a week
- Ability to access financial information
- Query capability for finding particular payments or deposits
- Customized account reporting options
- Details of accrued interest and charges on individual accounts
- Option to make payments directly from one's bank account to any other's account
- Batch processing of credit card transactions
- Transaction details in a file that can be interfaced with a variety of accounting packages
- Capacity to group and process one-to many payments such as creditor payments, salaries etc.
- Ability to process direct debit transactions
- Option to post-date payments for a future date
- Features to create payments in external software packages, such as payroll and accounting packages, for processing by the bank.
- Provision of weekly market commentary and daily exchange rate information.

In addition, for international trading, e-banking may offer a full suite of international transactions including:

- Foreign Currency Account Transfers
- Telegraphic Transfers
- International Cheques (Bank Drafts)
- Letter of Credit Application and Amendment
- Guarantee and Shipping Company Guarantee
- Collections

### **6.2.2. E-Commerce and new technology based banking services**

Imagine the convenience of everyday banking without having to leave the office. Imagine not having to write cheques, and post payments every month. With just a personal computer, a modem and bank of electronic banking, one can effectively

manage all monthly bills including payments to creditors, rates, power and all other invoices. The ability to transfer money between accounts, obtain transaction details and instant access to all financial records is more simple and easier. In fact, nearly all regular banking such as transfers, reconciliations and payments, paying wages and salaries from own office is quite possible through electronic banking. PC connects directly to the bank's computer for simple and convenient access whenever needed.

### **6.2.3. Optimization of branch networks in order to reduce cost**

The main aim of e-banking through the optimization of the branch networks is to tighten internal financial controls, reduce compliance costs, improve operational efficiency and organizational effectiveness, better capital management for significant savings of cash reserves, reduce capital costs from better risk management, improve strategic decision making, enhance perception and reputation among investor and client communities, and provide more flexibility.

With the widespread growth of the internet, customers want to use technology anywhere in the world to access a bank's network. The Internet, as an enabling technology, has made banking products and services available to more customers and eliminated geographic and proprietary systems barriers. With an expanded market, banks also have opportunities to expand or change their product and service offerings. Harnessing enabling technology to provide convenience and quality service through multiple channels at value for money price points is the bank's mission from inception in this electronic age. To this end the banks invested in a scalable architecture that allowed them to ramp up easily and handle the rapidly growing volume of customers, apart from reducing costs. To achieve and maintain an edge on its competition, a bank needs an open e-commerce platform that can:

- Integrate new e-commerce applications with existing applications to optimize IT investments and save on reprogramming and management costs
- Provide the power and scalability to handle multiple workloads, shift resources to match changing workloads, handle unpredictable peaks, and grow with the business
- Provide rock-solid security and advanced services availability for transactions all the time, around the world

- Exploit the value of customer and market data by deploying business intelligence (BI) and customer relationship management (CRM) software to help better anticipate, understand and respond to customer wants and needs
- Unify enterprise management chain with an open server platform that integrates purchase and sales processes with information on customers and product offerings for more timely, targeted and personalized customer service
- Integrate future technologies and new ways of doing business with customers

#### **6.2.4. Banking and bank regulation - Potential challenges for regulatory policy**

For redistributing capital from areas of excess to areas of scarcity, the most strategic option are the banks and this is the interest of governments of all the countries to watch closely and regulate the financial services in order to control redistribution of capital. Many regulatory reforms have come in to action in the recent years for removing the competitive protections that banks enjoyed for a long time. To survive in the increasing competition from mutual funds, brokerage firms, and insurance companies, banks have to provide complete financial services. Regulatory reforms are expected to allow investment banks to broaden their financial product lines. E-banking has also to accelerate the ongoing process of “financial deepening” i.e. the widening applicability of more formalized financial markets in the economy.

Globalization and increased competition are trends that have shaped the banking industry for decades. The expansion of e-banking contribute to these trends in the same way that previous advancements in telecommunications and data processing did; i.e., by reducing barriers associated with geography and national boundaries. Not only will competition be enhanced by the reduction of geographical barriers, but also by the increased ability of bank customers to search for and locate new suppliers electronically.

There are several ways in which the development of e-banking generates potential challenges for regulatory policy.

1. E-banking and developing technology, more generally are changing the structure and function of financial institutions. The existing regulatory structure has been developed based on traditional lines of demarcation among

different types of financial institutions, but these lines of demarcation are becoming less relevant over time.

2. E-banking may raise either new concerns or, more likely, accentuate or lessen concern about existing public policy issues. The most prominent example of a public policy concern accentuated by e-banking has been the issue of privacy.
3. E-banking challenges traditional methods of safety and soundness supervision by changing the nature and scope of existing risks, and possibly by creating new risks.
4. Finally, the nature and scope of technological change may require authorities to rebalance their emphases on regulatory rules and industry discretion.

#### **6.2.5. E-commerce and the trends in banking industry**

With the entry of private banks, the competitive landscape changed significantly over the last few years. There has been one pervasive goal among the banks to increase market share. Banks are employing multiple ways such as increasing the number of branches, installing ATMs, and providing telephone and internet banking. Banks are also adopting new technology and offering new products and services which sometimes take banks beyond their traditional role as pure financial service providers. Banks have established e-shopping malls and portals for making business-to-commerce (B2C) transaction. Banks also are now providing advice on investments and mutual funds.

Financial matters are the most sensitive issue for the consumers all over the world and paid extremely careful attention about personal finances. The reduced level of job security and the need to plan for the future are major concerns over personal debt, saving, retirement planning, and tax planning for the consumers. These concerns can be seen in the trend of customer purchase of investment services like mutual funds, annuities, and trust services.

All over the world, bank's traditional business of taking deposits and lending out the proceeds is on a decline. With the spread of information technology, companies find it cheaper to raise money from capital market than from borrowing from banks and investors have other and often more attractive ways to invest their money than just putting into plain savings accounts offered by banks. These twin pressures

compounded by the decline in interest rates have squeezed the net interest margins of the banking industry.

Along with the focus on new products and business opportunities, foreign banks are also developing the global processing centers by taking advantage of the infotech savvy staff and less expensive skilled labor.

### **6.3 HOME BANKING IMPLEMENTATION APPROACHES**

Home banking services enable to perform banking tasks, pay bills and communicate with the creditors quickly and easily from any computer available which is equipped with internet access. Home Banking allows one to bank on his/her own time.

In the year of 1970s home banking was started via a telephone, which enabled customers to check their account balances, pay bills, transfer funds and general information etc. At that time, with telephone banking, customers use numeric password on telephone to access banking services and to check their account balances etc.

In the year of 1980s home banking was considered via two-way cable TV, which enabled customers to check their account balances, pay bills, transfer funds and general information etc.

In the last decades of the 20th century, computer technology transformed the banking industry. The wide distribution of automated teller machines (ATMs) by the mid-1980s gave customers 24-hour access to cash and account information. On-line banking through the internet and banking through automated phone systems now allow for electronic payment of bills, money transfers, and loan applications without entering a bank branch.

Home banking in historical order, can be broadly classified into four main categories:

- 6.3.1. Proprietary bank dial-up services
- 6.3.2. Off-the shelf home finance software
- 6.3.3. Online services-based banking
- 6.3.4. World Wide Web-based banking

**6.3.1. Proprietary bank dial-up services:** The home banking service along with a personal computer and modem enables the customers to transfer funds or pay bills directly from their accounts to the creditors' account and the bank acts as an electronic gateway. Individual customers can subscribe for the dial-up service to maintain electronic checkbook registers and personal budgets, see account balances, transfer funds among accounts, and make electronic payments to other merchants. This type of home banking was very easy to use.

**6.3.2. Off-the shelf home finance software:** This type of service is provided through the software which contributes in cementing relationship between current customers and helping banks to gain new customers. Intuit's Quicken, Microsoft Money, and Bank of America's MECA are some of the popular software which provide home banking services and small business financial services for PC users and allow to organize, understand, and manage personal finances. The information entered once can be seen and analyzed using a set of reports and graphs. This software also helps users to reconcile their bank accounts, and track credit card purchases, investments, cash, and other assets and liabilities.

Online banking services can also be availed through these software as these allow users to download and automatically categorize savings and loan account activity, brokerage activity, and charge account activity, thereby reducing data entry and providing an easily accessible view of their financial assortment.

**6.3.3. Online services-based banking:** In this type of home banking service, banks set up their retail branches and subscribe their online services such as Prodigy, CompuServe, and America Online. Although Off-the shelf home finance software allow customers to manage their money, information regarding their financial transactions gets managed two times, once by the customer and once by the banks and the financial banking software can not reduce this duplication of efforts. Now some home banking financial services systems are emerging that make the bank an electronic gateway and reduce the monthly paper chase of bills and checks.

**6.3.4. World Wide Web-based banking:** As internet use is growing explosively, World Wide Web-based banking is also gaining popularity with the same pace. This form of banking provides a convenient and superior customer service in a secure



electronic environment. Banks are setting up their websites to float their financial products on the internet.

Online banking and internet banking are the two terms which have different meanings in terms of their operational processes. In case of internet banking, no additional software is to be purchased for storing data on customers' computers or no backup of any information is required, or no wait for new versions of software as all transactions occur on a secure server over the internet and banking can be done anywhere and anytime if the customer has a computer and a modem whereas for online banking, it requires a software such as Quicken, Microsoft Money, or AOL which has to be installed onto the computer which limits the customer to banking only from that computer.

The first internet bank to provide banking services electronically to internet users was Security First Network Bank (SFNB) and is available on the internet with the website <http://www.sfnb.com>. This bank offers highest interest rate in America for money market accounts. SFNB is offering joint accounts for multiple parties to access account information from various locations, full personal financial reports, and check imaging for internet banking customers to actually view scanned images of their checks online the day after they clear the bank.

#### **6.4 OPEN VERSUS CLOSED SYSTEM**

Open systems traditionally refer to a technology scheme that provides customers, external developers, or end-users to access the internal functions of a complex system via "public interfaces." In an open system, contents can be changed easily because of the use of standard technology and components. In simple words, a banking interface developed around the web is an open system that is easy to customize to a bank's changing needs. On the other hand, closed system can not be changed since everything is proprietary. For example, Quicken can not be modified unless a new version of this software is distributed by the vendor.

#### **6.5 MANAGEMENT ISSUES IN ONLINE BANKING**

Technology has thrown new challenges in the banking sector and new issues have started cropping up which are going to pose certain problems in the near future. The new entrants in the banking are with computer background. However, over a period of

time they would acquire banking experience. Whereas the middle and senior level people have rich banking experience but their computer literacy is at a low level. Therefore, they feel handicapped in this regard since technology has become an indispensable tool in banking. Foreign banks and the new private sector banks have embraced technology right from the inception of their operations and therefore, they have adapted themselves to the changes in the technology easily.

The proliferation of technology-based systems offers tremendous opportunities for banks to communicate with and serve their customers. At the same time, the major challenge facing the banking industry is the optimum use of technology to provide customers with new financial products for satisfying their continually changing financial needs. Banks must deliver high quality products at the customers' convenience with high-tech, high-touch personal and affordable service taking into consideration the five key values: *simplicity, customized service, convenience, quality, and price*. In this competitive online banking environment, banks have to be willing to take risk and make strategic decisions about the products and services offered online, and about exploiting the service attributes that build customer retention for profitable customers.

The performance that customers believe is an excellent service, banks can and should deliver, is the true standard for assessing service quality. Therefore, gaining a good understanding of customers' service expectations, as well as variations in those expectations across different customer segments, are essential issues for the management of banks for improving service quality. Consistently delivering superior service quality is much more a matter of meeting and exceeding customers' expectations rather than simply conforming to banks defined specifications. One of the biggest shortcomings of service banks is a failure to understand accurately what is important to customers. Hence for the realization of the full potential of banking financial services following key points have to be considered:

- Attractive financial products and services have to be developed
- Terminals at an affordable price are required for customers
- Untapped needs of customers and new market segments have to be explored
- Service quality on the part of banks has to be established for the customers

### **6.5.1. Differentiation between financial products and services strategies**

The changing market structure requires the banks and software companies to take the strategic decisions to differentiate their products in the competitive online banking industry and exploit the service attributes that build customer retention for profitable customers.

The proliferation of internet web sites means there may be a substantial advantage for banks able to distinguish their products from those of other banks i.e. to engage in “branding”. Doing so requires significant resources for advertising and marketing, a fact that is likely to work to the advantage of large firms. The internet provides a very effective searching device for consumers to choose the “best of breed” producers of specialized services. Intermediaries may play a role in helping users locate the “best” product given their individual preferences for quality, convenience, and price. These factors boost both the pace and scope of consolidation in the banking industry.

There are several significant strategic considerations that should be weighed in determining plans for developing an e-banking service and the type of services that should be offered.

1. Bank management must evaluate the degree to which current and future market demand for e-banking services warrant a change in their e-banking plans. The breakthrough in consumer usage of online banking may depend on developing new and better services rather than reducing the price of standard banking products. It also suggests that low demand for e-banking may be responsible for the “wait and see” posture of some banks toward offering e-banking.
2. Another consideration for banks in determining when, and how deep, to plunge into e-banking is the likely future competitive pressure generated by the development of the Internet. Banks face competition not only from their traditional rivals within the banking industry, but may increasingly find their market share threatened by banks from new, distant locations. In addition, non-bank firms (financial and non-financial) will increasingly contest banks for their most valuable customers.
3. A third strategic consideration in developing internet plans is the question of whether there are “early adopter” advantages. Some analysts point to the high

market concentration of e-banking customers in a few large banks as evidence that there will be a few big winners and those laggards will have difficulty catching up. The early-adopter-advantage-view also argue that e-banking will increase the extent to which economies of scale and scope can be realized, and that early adopters will better position themselves to exploit them.

Further, because of the rapid pace and broad scope of technological change in banking and payments, today's early adopter advantage in capturing customers using the current set of e-banking options may suddenly be undermined by the introduction of a new technology.

### **6.5.2. Pricing Issues in Online Banking**

One of the most crucial areas of decision making for banking is financial product pricing. E-banking is a significant non-interest expense at banks today. There are cases of many banks whose annual costs for e-banking are higher than those for their core systems. Many banks signed their original e-banking and bill-pay contracts several years ago when usage volumes were quite low and many vendors were still incurring high development costs. These contracts included some kind of per-account charge, activity-based pricing e.g. per bill paid, or a combination of the two.

Now, as products have matured and volumes have increased significantly, those same pricing schedules no longer make sense. In fact, many banks have been so successful that the earlier pricing structure is now punitive. Limited use of a cash management product for higher-end business customers can be included, with some limit on the number of customers.

As customer is not interested in paying per month subscription for a service that is already consumed by him at no price, it is much expensive to implement and operate online banking services. However, once a user confronts high connect charges, high subscription fees or both, shows interest in online banking services though customers are very price sensitive. Pricing affects online banking at three levels:

- 1. Initial software pricing:** Banks have to design strategies through which they can occupy a bigger market share and gain masses of customers. One way of

achieving can be through bundling of personal finance products and services in the form of software services with new PCs for the potential customers.

2. **Financial product pricing:** The development costs (associated with the design, implementation, and commercialization of a financial product), marketing costs (including costs of launching and maintaining financial products throughout its initial stage), and support costs (including the costs of providing and delivering the product, and maintaining it via back office systems) are the three major costs which have to be balanced.
3. **Usage pricing:** The volume of transactions in the bank decides this form of pricing. Banks have to offer incentives to attract customers to the service. If the target customers find new products costly, they will resist adopting them.

Pricing is a complex issue that has both long-term implications in terms of cost recovery and profitability, and short-term implications in terms of market penetration. While designing the pricing strategies for the financial products and services, banks must have to consider the above mentioned issues and make a balance between the costs incurred in providing, delivering, maintaining and promoting their financial products and services.

### **6.5.3. Marketing issues: Attracting customers and keeping customers**

While winning customers may be hard, keeping them is even harder. Customers really want quick response, instant information, and solutions to their problems. They want exceptional customer service. No organization can afford to lose customers because of poor service, but many do. Customers remember how they have been treated and spread the news. In today's high tech and demanding consumer market, customer service is mission critical. When customers are pleased, they are likely to spend more on product or service and will call again.

Customer expectations are higher than ever, particularly when it comes to online banking services. Bank operations need to become highly customer-centric in the area of Internet banking to ensure that the services they are delivering are the ones their users will actually use. Customers want access to their accounts anytime, from anywhere, using their preferred device or channel. They expect data that is accurate, up-to-date, and consistent across all channels. They take for granted that they will receive informed and timely support whenever they need it. In short, they want online

banking to make managing their accounts and satisfying their financial needs simple and easy. The applications that serve them must be visually appealing, easy to use and learn, and support user personalization that meets individual customer requirements. If an application is difficult to navigate or understand, customers simply would not use it, and may take their business elsewhere.

Additionally, as enterprise customer relationship management evolves, e-banking solutions need to complement and integrate with a banks' customer relationship management strategy. It is no longer acceptable for channels to be independent of one another. A system or solutions must integrate with back-end systems, scale to meet the needs of a growing user population, and contribute to a customer relationship management strategy that will increase customer retention, revenue per customer, and subsequently overall bank revenues.

While meeting demanding customer expectations, banks also need to nurture their own bottom line by building on the profitable relationships they have. They must be able to identify and serve their most profitable customers well, and take advantage of opportunities to offer additional products and services to targeted customers at the most appropriate time. To compete with aggressive competitors, banks and other financial institutions need to be able to:

- Provide services tailored to meet the needs of specific, high-profit market segments, such as businesses. Business customers are often a bank's most profitable customers. The need to attract and retain these customers is critical to a financial institution's healthy bottom line.
- Use the data that they have to identify customer segments and present targeted cross-sell messages when appropriate.
- Consolidate information about a customer so that a customer receives informed, timely, and relevant service regardless of the channel that they use.
- Quickly bring new services to market without disruption to existing services.
- Keep up with emerging technologies while maximizing return on investment.
- Minimize total cost of ownership.

#### **6.5.4. Managing financial supply chains in online banking**

The financial supply chain parallels the physical supply chain and represents all transaction activities related to the flow of cash, from the buyer's initial order through reconciliation and payment to the seller. Until recently, the financial supply chain went virtually unnoticed. The amount of time required to process transactions was unthinkable long because the manufacturing supply chain itself was fraught with inefficiencies.

The supply chain financial flow is at a critical threshold of evolution. Current trends in supply chain and financial flow management clearly favor the use of automated payment solutions. Continued expansion in this area offers high potential for reducing significantly purchasing processing costs, accelerating payment and invoice reconciliation, reducing collections costs significantly, creating greater processing efficiencies in the procurement of goods, and enhancing visibility, which means less uncertainty in accounts receivable (A/R) and accounts payable (A/P) and a reduction in working capital needs. As the adoption of new automation solutions for financial flows becomes more widespread, the superior efficiencies gained from electronic payment technologies are becoming more measurable and substantial.

Today the typical financial supply chain remains somewhat fragmented, complex and not integrated with the physical supply chain. Goods move faster than money, and disparate parties are involved. Moreover, even in today's world, the financial supply chain is partially composed of paper-based processes. To stay competitive, "just-in-time" working capital management should be the goal. Financial supply chain solutions enable CFOs and treasury managers to accurately manage their receivables or payables, forecast their company's financial future, and reduce their working capital needs. By optimizing financial supply chains, banks can:

- Reduce their working capital needs by using better inventory control and cash flow management, potentially representing significant annual savings
- Lower financing rates on required working capital through more effective management of their current asset position
- Reduce the costs of risk management through greater cash flow predictability
- Gain early warning into problems with any document in a commercial trade transaction that will likely cause payment to be delayed, then take corrective action to reconcile exceptions
- Improve customers relations

In this money-spinning market, to gain advantage, banks have to follow three strategies:

1. Powerful technology infrastructure, strong information architecture and lucrative online financial products and services have to be developed
2. Form partnership to link customers, intermediaries, banks, and third-party service providers in the online financial supply chain.
3. Banks have to shift from mass production orientation to mass customization of financial products and services so as to capture the loyalty of the customers by providing simple, convenient, and customer-centered approach for services to the customers.

## **6.6 SUMMARY**

For redistributing capital from areas of excess to areas of scarcity, the most strategic option are the banks and this is the interest of governments of all the countries to watch closely and regulate the financial services in order to control redistribution of capital. Many regulatory reforms have come in to action in the recent years for removing the competitive protections that banks enjoyed for a long time. To survive in the increasing competition from mutual funds, brokerage firms, and insurance companies, banks have to provide complete financial services.

The decade of 90s has witnessed a sea change in the way of doing banking. '*Anywhere banking*' and '*Anytime banking*' have become a reality. There is no specific online banking region to which the transactions are limited. Bookkeeping is simplified and automated and so is tax computation. Bills are paid with a minimum of effort. E-banking offers a wider outreach for banking institutions. E-banking is most useful when it saves the consumer time and money.

In the last decades of the 20th century, computer technology transformed the banking industry. The wide distribution of automated teller machines (ATMs) by the mid-1980s gave customers 24-hour access to cash and account information. On-line banking through the Internet and banking through automated phone systems now allow for electronic payment of bills, money transfers, and loan applications without entering a bank branch.



Electronic banking is using electronic means to transfer funds directly from one account to another. Electronic banking is a system that enables bank customers to access accounts and general information on bank products and services through a personal computer or other intelligent device. E-banking makes use of electronic currency. Check cards or debit cards, smart cards or stored-value cards, digital cash and digital checks are the different types of electronic currency. If anyone uses a check card to make purchases, the funds are transferred immediately from his/her account to the company's account.

With the development of technologies in the banking industry, there has been a major change in the banking system and in the way banks strive for increased profitability. In this changing environment, consumers' requirements are changing substantially. Now Customers want to access account related information, download account data for use with personal finance software products, transfer funds between accounts, and pay bills electronically.

The main aim of e-banking through the optimization of the branch networks is to tighten internal financial controls, reduce compliance costs, improve operational efficiency and organizational effectiveness, better capital management for significant savings of cash reserves, reduce capital costs from better risk management, improve strategic decision making, enhance perception and reputation among investor and client communities, and provide more flexibility.

With the entry of private banks, the competitive landscape changed significantly over the last few years. There has been one pervasive goal among the banks to increase market share. Banks are employing multiple ways such as increasing the number of branches, installing ATMs, and providing telephone and internet banking.

The proliferation of technology-based systems offers tremendous opportunities for banks to communicate with and serve their customers. At the same time, the major challenge facing the banking industry is the optimum use of technology to provide customers with new financial products for satisfying their continually changing financial needs. Banks must deliver high quality products at the customers' convenience with high-tech, high-touch personal and affordable service taking into

consideration the five key values: *simplicity, customized service, convenience, quality, and price*. The changing market structure requires the banks and software companies to take the strategic decisions to differentiate their products in the competitive online banking industry and exploit the service attributes that build customer retention for profitable customers.

One of the most crucial areas of decision making for banking is financial product pricing. E-banking is a significant non-interest expense at banks today. There are cases of many banks whose annual costs for e-banking are higher than those for their core systems. Many banks signed their original e-banking and bill-pay contracts several years ago when usage volumes were quite low and many vendors were still incurring high development costs. These contracts included some kind of per-account charge, activity-based pricing e.g. per bill paid, or a combination of the two.

While winning customers may be hard, keeping them is even harder. Customers really want quick response, instant information, and solutions to their problems. They want exceptional customer service. No organization can afford to lose customers because of poor service, but many do. Customers remember how they have been treated and spread the news. In today's high tech and demanding consumer market, customer service is mission critical. When customers are pleased, they are likely to spend more on product or service and will call again.

## **6.7 KEYWORDS**

**E-banking:** e-banking involves the collection, storage, transfer and processing of information assets

**BI:** Business Intelligence, a method where organizations keep an eye on the activities of their competitors

**CRM:** Customer Relationship Management

**ATM:** Automated Teller Machine

**SFNB:** The first internet bank to provide banking services electronically to internet users was Security First Network Bank (SFNB)

## **6.8 SELF ASSESSMENT QUESTIONS**

1. What is Electronic Commerce?
2. Discuss the role of technology in the banking industry.

3. Give a broad classification of home banking in historical manner.
4. Suggest some strategic considerations that should be weighed in determining plans for developing an e-banking service.
5. Differentiate between Online banking and Electronic banking.
6. Describe some of the marketing strategies for attracting and maintaining the customers in e-banking.

## **6.9 SUGGESTED READINGS**

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## **LESSON: 7**

### **E-COMMERCE AND RETAIL INDUSTRY**

**Subject: E-Commerce**

**Paper Code: MM-409/IB-419**

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#### **STRUCTURE:**

- 7.0 Objectives
- 7.1 Introduction to E-Commerce and Retail Industry
- 7.2 Changing Retail Industry Dynamics
- 7.3 Online Retailing
- 7.4 Buying Process in Online Retailing Environment
- 7.5 Some Myths of Online Retailing
- 7.6 Management Challenges in Online Retailing
- 7.7 Summary
- 7.8 Keywords
- 7.9 Self Assessment Questions
- 7.10 Suggested Readings

#### **7.0 OBJECTIVES**

The motive of this chapter is to present an introduction to online retail industry and within that framework the key basic concepts of online retailing, changing dynamics of retail industry, and marketing challenges using technology in the retail industry are discussed.

After going through this lesson, you will be able to:

- Describe the concept of online retailing.
- Explain the reasons for changing dynamics of retail industry.
- Describe the consumer buying process in online retailing.
- Discuss the management challenges related to online retail industry.
- Describe some of the strategies related to online retailing.

## **7.1 INTRODUCTION TO E-COMMERCE AND RETAIL INDUSTRY**

Retailing on the web has evolved as a new subject for research and development. The rapid development of technology is changing almost every aspect of retail operations such as service, advertising, store design, order fulfillment etc. Anytime and from anywhere concept (home, work, office, or restaurant) for online transactions is impacting the old retail business process.

The inevitable conflict with traditional distributors is perhaps the hardest thing for established companies to confront. The distribution system that has served established companies so well to date was designed for a different world, one in which retailers, distributors and resellers were the contact point with customers. In the past it was much cheaper for a customer to go to a store than to go to each individual manufacturer, so most sales have been done through an indirect distribution system. But now companies have found that in the internet world the cost of customer contact is not only much cheaper but it can be turned from a cost into a benefit. Companies can get more information and more loyalty and can sell additional products that way. The marketer with an individual connection to a customer has more sales incentives and opportunities.

When customers are enabling themselves to accept this new change, retailers need to consider carefully the following issues in online retail business so as to formulate effective business strategies:

- Type of products and contents to sell
- Features to be incorporated in their websites that can attract customers and make easier to them selecting online purchase
- Simplifying process from customer's shopping to retailer's order fulfillment
- How much to charge and consumers are willing to pay for the online retail transactions
- How to penetrate the market and how much time to take for attracting customer and become profitable

## **7.2 CHANGING RETAIL INDUSTRY DYNAMICS**

Information technology is an integral and crucial component of consumer products and the retail trade. With information at the heart of critical manufacturing and marketing decisions, companies with the best IT and the best technologists have a big head start on their competitors.

Retailers consider the online environment as a way of doing business as many of the factors are affecting the retailing industry dynamics and need a careful attention. Some of the important factors are:

### **Overbuilding and Excess Capacity**

Early 1980s was the time of overexpansion for retailers but by the end of the decade a decline in profits and increase in operational expenses was observed. Where sales growth and market share were to increase, the retailers had to reduce the staff for their profit enhancement. This led retail industry to use untrained workers. They were not able to serve shopper needs and a general perception emerged that the retailers are not able to provide quality service.

The online retailing can resolve this problem as it does not require bricks and mortar storefront or critical location. The traditional retail companies may severely be affected by the online retailing who have invested huge in expansion and adding capacity. It is important to consider that the constraint of time and space will disappear if online retailing takes off.

### **Demographic Changes**

Time constraint, safety concerns, two career couples, and growing frustration with the lack of courteous service and insufficient product information are some of the reasons that are urging the shopping patterns towards new innovative trends among consumers. Understanding these implications and shopping behavior of consumers, retailers can get advantageous of online retailing. As shoppers have less time and want better values with more options, retailers with improved technology can drive these consumers to online shopping with home delivery.

On the other hand, a growing segment of population (older shoppers aging more than 50) prefer shopping at stores rather than online because for them time constraint are less of a problem. Also with the aging of population, consumer interest may change for material goods and services such as travel and recreation. So retailers need to concentrate on value by including bundling of facilities with the merchandise.

### **Consumer Behavior**

Consumer behavior in online retailing is more unpredictable and volatile than ever before and retailers are striving to develop new effective strategies for satisfying needs and wants of consumers. Consumers are demanding a very large selection of products with deep discounts. They are no longer as influenced by brand names as they used to be and are less willing to pay more for the brand name but very cautious about quality and value. Thus the retailers focusing on providing best price, service and selection in the form of value will be successful. Retailers need to learn how to bundle their products so that they become the preferred choice for online customers.

### **Technology Improvements in Online Retailing**

Till now, traditional retailing is far from competitive threat of online retailing but attractive technology and its applications are persuading online retailers. Television retailing, CD-ROM retailing, and online service-based retailing or web-based retailing are gaining importance.

- **Television Retailing:** The reach of TV retailing is amazing. Households receive the signals via cable, satellite dish etc., twenty four hours a day, and seven days a week. Unlike online audiences, which tend to be affluent and well educated, the target audience for TV retailing is moderate income households and mostly women.

In TV retail marketing, a show host presents the merchandise and conveys information such as features, quality, benefits and price of the product. Viewers place orders for products by calling a toll-free telephone number. Generally, with seven to ten business days of placing an order, product is

delivered to the customer and may be returned back within thirty days for a full refund of the price.

Effective utilization of electronic media has resulted in the success of TV shopping. High quality, cost efficient and entertaining documentaries have become a new and interesting way to retail specialty products.

- **CD-ROM based Shopping:** A cost effective alternative to traditional print catalogs are the CD-ROMs because these are relatively inexpensive to produce and distribute. Retailers can create their own disk or participate in a multiple marketer disk. The crucial business idea behind catalog is to build name and brand recognition for the stores and manufacturers. A CD-ROM catalog has multimedia capability and enables retailers to add sound, photos(JPEG), and full motion video (MPEG) for their product presentation. CD-ROMs can also be interactive, enabling the customer to pick and choose categories to view, or full motion video to run. This is a cost effective as well as visually superior method for showing the product and its information.

However, consumers are not so much comfortable with this shopping method as the CD-ROM once created can not be updated whereas other online based methods allow continuous updating.

- **Online-based Shopping:** The flourishing online marketplace is attracting the following distinct types of retailers to offer their products online:
  - Retailers operating off-line stores with online sales fronts
  - Catalog retailers
  - Retailers not currently operating retail business but have understanding of this 'new age' medium for revolutionize shopping
  - Manufacturers finding new ways to reach direct to consumers

Because of the wider reach, constant innovation and low cost world wide web has been accepted around the world in a very less time. Retailing is not an exception to it. Initially retailing on web was more focused on marketing and



less on order taking. Gaining the experience of web, companies have realized the importance of study to know consumer habits, define trends, develop products to fit a plan and turn consumer statistics into long-term customer relationships. Retailers are developing programs to deliver online shopping to web users round the clock.

The curiosity aspect of online retailing is the emergence of companies that only exist online, like amazon.com. Online service providers such as Compuserve and America Online (AOL) are the online malls offering their wares effectively.

### **7.3 ONLINE RETAILING**

The idea behind online retailing is that people do not want to go to the store so online retailers can cater to the needs of a niche audience who want to buy over the internet and this can help in building a billion dollar business with no inventory. Generally, online retailers have online database of their products, allow comparison shopping based on price and provide home delivery service.

Retailers provide database to the customers through an online service of their products in which product pictures are available. Consumers can also request a list of items by categories, by item, by brand, or even by what is on the sale in the store on a given day. Retailers back office is linked with mainframe databases of the super markets at which it shops for its customers. Consumers can give specific shopping instructions or comments to get extra information. Consumers can also access the 'Help' screen for immediate assistance during online ordering.

After finishing shopping, consumer click 'Done' on the screen and the order is electronically routed to retailer and retailer serves the customer according to his request.

#### **Web-based Travel Agencies**

Hotel booking, car rentals, and online tickets etc. are some of the issues in travel business which have been simplified with the world wide web. Travelers depict making reservation a very time consuming and frustrating process. On the other hand, it is an increasingly costly one for the ticket providers. For decision making, travelers

demand more and more travel information and services while insisting on lower rates, which increase costs for travel agencies while reducing revenue.

### **The State of Online Retailing**

The long-term prospects for online retailing are strong. As the industry has matured, online retailers are increasingly emphasizing targeted marketing rather than the hugely expensive mass-media advertising campaigns of the industry's youth. While early marketing poured billions into television advertising, most online retailers now favor online media, investment in site improvements, promotions such as free shipping, and tailored advertising in focus chat rooms and message boards.

But in spite of the online retail industry's success in enhancing its online systems and marketing efforts, a human touch is still important, even if it is nothing more than one neighbor observing another's Valentine's Day delivery from flowers.com. The role of emulation in online consumer decision making should not be overlooked. Interestingly enough, the neighborhood effect disappears for repeat purchases. Once consumers have their own experience, they rely on that and are more likely to disregard the actions of others.

What critical for online retailers, is to begin thinking about ways to fuel this process. Firms can begin to think about ways to exert some control over how this process spreads rather than just sitting back and letting the space-time diffusion happen organically. Online retailers should run experiments. Given the huge geographical reach of an online firm, it is possible to run very clean experiments in the sense that one can select very distinct regions, treat them differently and keep them separate from each other.

Areas with greater numbers of wealthy and college-educated people are also quicker to try an online retailer, with an increase in young wealthy individuals adding an additional positive effect and higher percentages of elderly slowing trial times. A region's size in terms of land area is unimportant, but the number of households, population density and urbanization are all critical, resulting in a significant positive effect on the time to first trial.

There is also a need to keep and analyze data such as customer ID numbers, order times and dates, order values and shipping zip codes, as well as good records about the company's own marketing efforts to check how much was spent on various marketing strategies, at what times and where.

#### **7.4 BUYING PROCESS IN ONLINE RETAILING ENVIRONMENT**

There are several stages in the online buying process. While each consumer and buying situation is different, retailers can utilize the framework set forth to help aid in designing an online retail storefront. This framework identifies four common stages of the buying process in the order that a customer is likely to go through them:

- Need identification
- Development of a consideration set
- Information search and evaluation of alternatives
- Choice/decision.

**Need Identification:** The first stage in the buying process is need identification, in which a consumer decides what type of product he/she is seeking. The need could originate from an end cap display that invokes an impulse to consider an item, such as candy and magazines at the checkout counter of a grocery store. The need could originate from a recognized deficiency in one's home, such as purchasing a home without a refrigerator. The need could originate from a friend who recommends a new band. Querying customers on current lifestyle issues, life changes, significant dates such as birthdays, and other such information can aid retailers in identifying relevant products that customers may desire. In an online environment, a recommendation agent could use this information to help customers to identify undiscovered needs.

**Develop Consideration Set:** Developing a consideration set is the second stage in the buying process. In this stage, consumers generally only look at a few attributes, potentially seeking to eliminate products that do not meet a minimum requirement. The level of analysis is minimal at this stage and the consumers will most likely attempt to limit the consideration set to a small, manageable number of products to compare in more detail. For example, when purchasing a car, a buyer may first

narrow the category of cars into types of cars. In this case, the consumer may be seeking a sports car, and thus begins to look for sports car. The consumer may begin browsing the various options to determine a set of minimum attributes or may have some attributes in mind. The attributes could be as simple as a sports car at a low price with a computer display and the ability to program trips with hills to make the workout interesting. At this stage, physical touch and face-to-face interaction, such as trying out the sports car or watching a sales person demonstrate the sports car, may not be that important. While this stage does not seem very important, if the buyer has not chosen the appropriate screening attributes or taken the time to seek out many alternatives, the buyer may miss a superior product choice.

**Information Search and Evaluation of Alternatives:** Information search and evaluation of alternatives is the third stage. At this point, it is likely that a consumer will make detailed comparisons on an attribute by attribute basis. Generally, physical touch and face-to-face interaction, such as trying out the sports car or watching a sales person demonstrate the sports car; will be more important when comparing several sports cars on a more detailed level, than when developing a consideration set. This is the stage where all the information will be collected and analyzed so that a decision on the “best” alternative can be made.

**Choice/Decision:** The fourth stage is the choice or decision stage. At this point, the consumer decides which product he or she will purchase based on the information gathered in the previous two stages.

## **7.5 SOME MYTHS OF ONLINE RETAILING**

After the collapse of hundreds of dotcoms, investors abandoned their pipe dreams of getting rich quick with e-commerce. Failed online grocers, drug stores, auto dealerships, pet supply stores, and other budding e-commerce businesses litter the trash bin of recent Internet history. The bubble burst and the old economy is back with a vengeance. Contrary to popular belief, however, consumer e-commerce is not dead. Retail e-commerce sales grew much slower than previous years, but it is growth nonetheless.

Although many pure-play e-commerce companies have been abysmal failures, brick-and-mortar enterprises continue to establish retail sites. They may have been slow to jump into e-commerce (which looks incredibly prudent in hindsight), but they have embraced it for the long haul. They have taken a slower and more considered approach, trying to learn the lessons from the failures and successes of extinct and surviving e-commerce pioneers.

There are still a lot of mistaken ideas about consumer e-commerce floating around and it is important to avoid these pitfalls from the past. Here are some B2C myths that can lead the astray when it comes to managing e-commerce operations:

**Stickiness is good:** Many sites aspire to keep customers on the site for as long as possible, a quality often referred to as “stickiness”. Sites often add features and design navigation to increase stickiness. The longer customers stay on the site, clicking from page to page, the more they must like the site. When it comes to e-commerce sites, stickiness is more like stepping on a wad of chewing gum than luxuriating at a resort. Customers do not like wasting a lot of time on a site when they are looking for a particular product. Think of it this way: When you visit the local pharmacy to fill a prescription, do you like to hang out any longer than necessary?

**More is better:** Some sites try to wow customers with flashy technology by bombarding them with fancy graphics, animations, and sound effects. Others try to impress shoppers with largesse of information and options. Fancy visual and sound effects slow sites to a crawl. Screens overloaded with information and options are confusing. Visitors are more likely to return to a site with faster-loading pages than they are to sites that provide rich media. More is better when it comes to product information, not flashy technology. Visitors would be more likely to return to a site that offers more product information.

**Personalization drives profitability:** In recent years, much has been made of personalization technologies to drive profitability. It turns out that personalization is just one of a number of merchandising techniques that e-commerce sites should consider for incremental sales improvement. The problem is that customer actions do not always reflect their interests. One may buy a book on baseball as a gift for his/her friend. As it turns out, he or she may hate sports, but that doesn't stop the site from

continually calling his/her attention to books on baseball, football, basketball, and the like. Instead of investing in expensive personalization technology sites would be better off devoting energies to proper merchandising by answering questions and having items logically arranged.

**Selling anything on the web:** Selling CDs and books online is one thing, selling automobiles, liquor, and major appliances is another. Certain products are not a good fit for e-commerce sales. Sometimes it is due to legal restrictions such as those that affect the sale and distribution of alcohol or those that involve vehicle registration. Sometimes shoppers need to kick the tires or try on an expensive piece of apparel to make sure it fits. And sometimes the discounted price shoppers find on the Web may not offset the hefty shipping charges for large, heavy items, such as an oven or a jacuzzi. Although one may not be able to complete the transaction on the web that does not mean the web can not assist the sale. One can still use web site to inform customers about these items and direct them to the appropriate sales channel.

## **7.6 MANAGEMENT CHALLENGES IN ONLINE RETAILING**

The major revolution in the retailing sector with the introduction of technology has compelled the managers to rethink upon their marketing strategies. Those who are not using computer or not familiar with internet technology are most at risk as traditional retailing require up-gradation of the unique capabilities of the online medium to effectively meet the changing needs of the consumer. The greatest opportunity belongs to traditional retailers that can establish multi-channel relationships with their customers, blurring the distinction between channels and fundamentally altering the way people shop. So retailers have to understand this tricky technology along with consumer behavior. This generates many management challenges in front of managers who have a desire to succeed in online retailing. Retailers have to find ways to attract consumers to the online marketplace.

**Make the most of customer information and relationships:** The rich knowledge base and strong relationships that traditional retailers have developed over the years allow them to anticipate their online customer needs in ways that no pure-play competitor could possibly match.

**Integrate online and offline channels:** The multi-channel customer is expecting a seamless shopping experience, which means integrating all aspects of retailing - including branding, inventory forecasting systems, and product returns.

**Leverage offline scale:** Purchasing power is one of the greatest assets a traditional retailer possesses. They must use their offline purchasing power to deliver cost advantages to their online operations.

**Come up with a retailing strategy:** Defining consumers' needs and by understanding the consumers' purchasing process, retailers have to reexamine the retailing strategy to stimulate demand in the online environment. Retailers have to analyze the shifting attitude and lifestyles of consumers and make use of marketing methods to trigger sales.

**Manage channel conflict:** Moving online can trigger conflict between channels. Incumbents need to find creative ways to avoid conflict within the company and its supply chain.

Every business organization requires channel distribution to reach their products or services to the end customers but online technology reduces the importance of these 'middlemen' by communicating information about products and orders directly. These middlemen such as distributors, brokers, and wholesalers have to foresee this threat for their existence; otherwise they could be the real losers in online retailing.

**Learn to price online products/services:** Access pricing and product pricing are the two types of pricing that need to be seriously attended by the marketers in the online marketplace. Customers would not like to pay in the off-line world just for entering the store to shop but every online store is essentially demanding consumers to pay charges to their internet access provider. In virtual market environment also, consumers can not be expected to buy products or to use new untested services. Retailers would not achieve a critical mass of people shopping in virtual stores. Therefore, it requires some cost shifting so as to reduce the burden on the consumer; otherwise the store will be bypassed. In the product price there is some store-related

cost and if the store is physically removed that cost can be utilized to pay for enabling technologies, delivery and other costs.

**Deliver a satisfying shopping experience:** Though virtual environment provides a marketplace where consumers without waiting in queue and wasting time can shop but are they comfortable in finding products, making selections and enjoy the whole online shopping process? The challenge before management is to build such a process through technology for delivering a satisfying shopping experience. Online retailers are also finding customers with unfavorable attitude towards this new market. Limited selection of products is also not appealing to the customers. Consumer interface needs to include text, graphics, simulated 3-D, and actual virtual reality for presenting products or services.

Some online retailers are trying to find solutions for these complex problems. Many firms are discovering ways that are genuinely pleasant and appealing. Unlimited selection, prices close to cost, and two way communication capability are expected from virtual marketplace to grasp a critical mass of people shopping in online retail stores.

**Design the layout of an online store:** Shifting a consumer from traditional off-line market to online market is not an easy task. Virtual stores have to put a great impact on consumer buying behavior by providing better, faster, cheaper, and more entertaining shopping experiences.

The layout of the online store also depends on slotting allowances paid by manufactures to the retailers for stocking new products. In exchange for this slotting allowance, the retailer makes an agreement with the manufacturer to place the product in a high traffic area for promotional purposes.

Sophisticated user interfacing is also one of the criteria of good layout of the virtual store. Consumers want to find familiarity in virtual store with traditional off-line one. They want to 'walk' the aisles of this store on their screens, pick a box off the shelf, rotate it around to read the side label and look for a special offer, put it back on the



shelf, or put it into the basket. This can be made possible by capturing 3-D images of every product in the store.

Users also want to be able to see how a product looks on them before buying it. For instance, shoppers want to see how paints will look without actually trying them on.

**Leverage brands:** Managing brand is a newer area of online retailing. Consumers adopt a brand, and make it part of their lifestyle. They remain loyal and purchase the brand again and again. Till now online retailers have a very limited understanding of the marketing variables that affect purchases and require a better understanding of brand management in conjunction with online consumer behavior.

With well-developed brand recognition and trust, incumbents should have lower customer acquisition costs and higher conversion rates from the day they go online.

**Create right incentives to entice customers online:** Given that the cost to serve a customer can be lower online than it is elsewhere and that the Internet offers opportunities to increase share of customer wallet, multi-channel players should actively encourage their customers to use the Internet.

For influencing the consumer acceptance in online markets, retailers require to well understand the incentive design. The right approach in designing coupons, discounts, or other incentives can help online retailers to build and retain shopper loyalty. Though incentives are most common in traditional retailing but retailers need to think about different incentive strategies for different types of online products or services. As online retailing is different on many grounds and requires online marketers to rethink their incentive mechanisms.

**Use distribution infrastructure to advantage:** Distribution infrastructure is difficult to build from scratch. Catalogers are extremely well positioned to leverage established systems for the online channel.

**Exploit opportunities for partnering:** Partnering can speed execution, give access to critical skills, and generate additional equity from incumbents' assets.

**Target total customer wallet:** Incumbents should aim high and seek to capture 100 percent of category spending from each customer household.

**Use best customer to model future improvements:** Online retailers need to gain market understanding that is based not on averages but on in-depth dialogue with their best customers.

**Fulfilling relationships:** Smart retailers know it is important to have the right merchandise in the right place, at the right time. Smart retailers also know that fulfilling their customers' needs is critical to building loyalty. Online retailing has not made fulfillment any easier. Customers enjoy the immediacy of shopping online, but immediacy is also becoming expected in delivery. Speed, flexibility, adaptability both to changing consumer lifestyles and expectations are critical not just to the retailer's merchandise mix, but to the fulfillment process as well.

Gone are the days when customers were willing to “allow six to eight weeks for delivery.” Fulfillment has had to reinvent itself to keep up with the fast pace of the internet and retailers' just-in-time inventory programs, but some internet retailers continue to struggle with timely deliveries and in-stock issues. Fresh foods, prescription drugs, and large items like appliances and furniture each create their own unique logistical challenges for online retailers.

More and more attention is being paid to how online retailers are delivering or in some cases failing to deliver, the goods. Fulfilling customers' orders and expectations is no longer an afterthought that happens after the all-important sale. It is a critical component of serving the customer and gaining repeat business and a key business function for any online retailer.

## **7.7 SUMMARY**

The idea behind online retailing is that people do not want to go to the store so online retailers can cater to the needs of a niche audience who want to buy over the internet and this can help in building a billion dollar business with no inventory. Generally,

online retailers have online database of their products, allow comparison shopping based on price and provide home delivery service.

The rapid development of technology is changing almost every aspect of retail operations such as service, advertising, store design, order fulfillment etc. Anytime and from anywhere concept for online transactions is impacting the old retail business process. When customers are enabling themselves to accept online retailing, retailers need to consider carefully online retail business issues to formulate effective business strategies:

The traditional retail companies may severely be affected by the online retailing who have invested huge in expansion and adding capacity. It is important to consider that the constraint of time and space will disappear if online retailing takes off.

As shoppers have less time and want better values with more options, retailers with improved technology can drive these consumers to online shopping with home delivery. On the other hand, a growing segment of older shoppers prefer shopping at stores rather than online because for them time constraint are less of a problem.

Consumers are demanding a very large selection of products with deep discounts. They are no longer as influenced by brand names as they used to be and are less willing to pay more for the brand name but very cautious about quality and value. Thus the retailers focusing on providing best price, service and selection in the form of value will be successful.

Till now, traditional retailing is far from competitive threat of online retailing but attractive technology and its applications are persuading online retailers.

The reach of TV retailing is amazing. Households receive the signals via cable, satellite dish etc., twenty four hours a day, and seven days a week. Unlike online audiences, which tend to be affluent and well educated, the target audience for TV retailing is moderate income households and mostly women. Effective utilization of electronic media has resulted in the success of TV shopping. High quality, cost

efficient and entertaining documentaries have become a new and interesting way to retail specialty products.

A cost effective alternative to traditional print catalogs are the CD-ROMs because these are relatively inexpensive to produce and distribute. Retailers can create their own disk or participate in a multiple marketer disk. The crucial business idea behind catalog is to build name and brand recognition for the stores and manufacturers.

Initially retailing on web was more focused on marketing and less on order taking. Gaining the experience of web, companies have realized the importance of study to know consumer habits, define trends, develop products to fit a plan and turn consumer statistics into long-term customer relationships. Retailers are developing programs to deliver online shopping to web users round the clock.

The long-term prospects for online retailing are strong. As the industry has matured, online retailers are increasingly emphasizing targeted marketing rather than the hugely expensive mass-media advertising campaigns of the industry's youth. While early marketing poured billions into television advertising, most online retailers now favor online media, investment in site improvements, promotions such as free shipping, and tailored advertising in focus chat rooms and message boards.

The major revolution in the retailing sector with the introduction of technology has compelled the managers to rethink upon their marketing strategies. Those who are not using computer or not familiar with internet technology are most at risk as traditional retailing require upgradation of the unique capabilities of the online medium to effectively meet the changing needs of the consumer. The greatest opportunity belongs to traditional retailers that can establish multi-channel relationships with their customers, blurring the distinction between channels and fundamentally altering the way people shop. So retailers have to understand this tricky technology along with consumer behavior. This generates many management challenges in front of managers who have a desire to succeed in online retailing. Retailers have to find ways to attract consumers to the online marketplace.

Gone are the days when customers were willing to “allow six to eight weeks for delivery.” Fulfillment has had to reinvent itself to keep up with the fast pace of the internet and retailers’ just-in-time inventory programs, but some internet retailers continue to struggle with timely deliveries and in-stock issues. Fresh foods, prescription drugs, and large items like appliances and furniture each create their own unique logistical challenges for online retailers.

## **7.8 KEYWORDS**

**JPEG:** Joint Photographic Experts Group, is a international standard for high quality compression of still photographs.

**MPEG:** Moving Picture Experts Group, is a international standard for high quality compression of digital video.

**WWW:** World Wide Web

**AOL / COMPUSERVE:** Famous internet service providers in US

## **7.9 SELF-TEST QUESTIONS**

1. What is online retailing? Describe briefly the technological improvements in online retailing.
2. Explain the buying process in online retailing environment.
3. What are the various issues that need to be considered in formulating effective business strategies for online retailing?
4. Describe the changing retail industry dynamics in an online environment.
5. Discuss some of the myths of online retailing.
6. What are the major management challenges facing business organizations in online retailing?

## **7.10 SUGGESTED READINGS**

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# **LESSONS: 8**

## **ELECTRONIC COMMERCE AND ONLINE PUBLISHING**

**Subject: E-Commerce**

**Paper Code: MM-409/IB-419**

**Author: Dr. Pardeep Ahlawat**

**Vetter: Dr. Anil Khurana**

### **STRUCTURE**

- 8.0 Objectives
- 8.1 Introduction to Online Publishing
- 8.2 Online Publishing Strategies
- 8.3 Approaches to Online Publishing
- 8.4 Advertising and Online Publishing
- 8.5 Summary
- 8.6 Keywords
- 8.7 Self Assessment Questions
- 8.8 Suggested Readings

### **8.0 OBJECTIVES**

The motive of this chapter is to present an introduction to online publishing and within that framework the importance of online publishing in corporate environment, online publishing strategies, approaches, and online advertising are discussed.

After going through this lesson, you will be able to:

- Describe the products of online publishing.
- Explain the issues involved in online publishing.
- Describe the online publishing strategies and approaches.
- Discuss the benefits and opportunities of online publishing.
- Describe the effectiveness of web advertising.

## **8.1 INTRODUCTION TO ONLINE PUBLISHING**

Online publishing is continuously attracting both commercial and corporate publishers through new interactive technologies because application of these technologies captures the imagination of both content provider and the public. Earlier, business was not much benefited by online publishing; the reasons being online publishers were not experienced with selling and understanding of business to them was also very poor. Businesses were attracting towards web but failed to define even business purposes driving their online presence. Then publishers realized that mere presence on the web can not guarantee success. Exciting technology without relevant content can not drive profits or capture market share. More attention is needed towards tricky delivering of content for successful online publishing.

Business organizations are now investing huge amount in people, equipment, marketing, brand building, and contents to find the best way to capture the consumers' attention and in search of business model that could make these firms profitable sooner than later but have not been able to figure out which business model works best for money making. However, new models are being developed by online publishers to convince customers for justified charges of unique and valuable information, programme, and services offered to them.

As more and more firms begin to offer online content, these are forced to adjust to new customer attitudes regarding pricing. In the offline business, publishers charge large advertising fees from the firms by offering mass markets for delivering message. News, information, and entertainment are expected to be almost free for general public and that advertisers will pay the bill. This concept is not practical in online marketplace where instead of mass marketing, one-to-one marketing is considered. Customers select their information and delivery methods but are not eager to pay online content. The size of customers and their habits are nearly impossible to figure out. Even new advertising models can not be claimed to draw profits on the internet. While ad revenues are not coming close to covering expenses, now they could grow substantially in coming years as



the traffic increases and brand names become established. Brand development is important because every time a user sits in front of a web browser needs to make decision about where to go. The better the brand, more likely it is to popup in the consumer's mind.

One more important aspect in online publishing relates to digital copyrights. The internet makes it extremely easy to copy, retransmit, and alter works without the permission of the copyright holder. Moreover, the digital world has no internal boundaries, and policing is impossible since the levels of protections and sanctions against infringement vary widely in countries across the globe, which makes the risk even greater. Clearly, without effective protection, publishers are not willing to risk their investment and hard work.

### **The Products of Online Publishing**

The web has suffered from the same drawbacks, which beset multimedia publishing in its infancy – a lack of business direction and the hi-jacking of operations by technologies without any business knowledge. It is important that publishers identify the product they are selling and its suitability for on-line delivery. Electronic goods consist of electronic journals, magazines and newspapers, electronic books, multimedia CD-ROM, software, computer games, music, and online databases.

Digital goods and services are those whose purchase and delivery can only be conducted via electronic channels. Thus electronic publishing products are well suited to this medium of production and delivery. The products most suited to electronic commerce are on-line databases and electronic journals, magazines and newspapers as these can be accessed, paid for and delivered directly to the users PC.

### **Reasons for Online Publishing**

At this moment, it is also necessary to debate on what exactly is meant by online publishing. It is an act of disseminating information. Online publishing can also be viewed as the activity of publishing for sale. Publishers package their product as a

bundled commodity rather than disjointed information in order to realize revenue from their information.

In the late 1960s the concept of online publishing evolved out of public funding associated with the aerospace and medical research programmes. Many of the publishers switched from manual typesetting and printing to computer-assisted photocomposition and developed their databases. Earlier photo compositions were very expensive and not able to offer much variety but enabled the creation of a central database from which a series of online services could be provided. Improved communication networks, availability of low-cost terminals, and remote access and dialup database systems were the other technical developments that put a great impact on online publishing.

Online publishing is increasingly popular in works of fiction as well as with scientific articles. Online publishers are able to provide quick gratification for late-night readers, books that customers might not be able to find in standard book retailers, and books by new authors that would be unlikely to be profitable for traditional publishers.

Internet and web recently have brought online publishing from a niche target audience to a mass audience. The reasons for the sudden increase in the interest of publishers, advertisers, and content providers in the web include:

1. Rapid evolution of technology and acceptance of web at large made it possible to meet time-to-market requirements that were even beyond imagination a few years back.
2. It is not necessary to invest huge amount in advance for uncertain returns rather much of the investment in infrastructure has been made by others such as Internet Service Providers (ISPs), hardware companies, and various software developers.
3. It allows publishers to interact with large number of customers in a mass market by exploring new ways of targeting and reaching customers.

4. As compared to conventional media, publishing and advertising involve less of egos and financial interests of powerful multiple-system cable television operators, television network, and group broadcasters.

### **Issues of Online Publishing**

The publishing industry like many other industries has not escaped the impact of information technology in both the production and distribution of the information it creates. From earliest DTP techniques to the selling of books over the Internet and publishing of electronic journals the publishing industry has readily accepted technological innovation. Many publishers are now ready to embrace the potential of the web as a method of publishing and distribution rather than as a purely marketing tool.

Although the number of businesses on the internet has grown, many organizations simply have a web presence and do not make strategic use of the opportunities the web offers. This lack of progress is probably due to concerns over issues such as security, payment mechanisms, user authorization and misuse of personal data. Technologies concerned with authorization include firewalls, password access, smart cards and biometric fingerprinting. However in order to provide secure electronic transactions (SET) encryption technologies are used. Encryption technologies, which are supported by the appropriate legal mechanisms, have the potential to develop electronic commerce globally. These issues have to address not just for the development of e-commerce within the publishing industry, but also for the development of global electronic commerce.

Intellectual property is also a major issue for publishers and authors and in particular copyright. Copyright is initially retained by the author of the work, however it may be sold or a license granted to enable reproduction of the work. Any electronic transaction in the publishing industry must include a mechanism of copyright payment. Electronic commerce allows authors the opportunity to self publishes, however only a small portion of authors especially in the academic sector earns enough from books sales alone to generate substantial revenue. It is an area, which is worth some future consideration for commercial publishers as electronic commerce develops.

There is another issue of quality especially if the information chain is redefined. The publishing chain at present incorporates a number of quality filters such as copy editors and proofreaders, which may be difficult to apply in the electronic environment. On-line publishing must be able to enforce the same quality control, although referred electronic journals do employ strict refereeing controls.

The question of information retrieval is important, as users have to be able to find exactly what they are looking for. Perhaps now is the time to create a central National Internet Library similar to the Library of Congress and British Library where all electronic works can be deposited.

Surprisingly, the advertising world has also come under the attention of publishing community with the fast adoption of internet and web. Advertising industry has been relatively untouched by technology. Advertising agencies have been notoriously resistant to change in the past, and their reaction to advertising on interactive media has been no exception. These agencies have to embrace the new media to be relevant to their clients. The technology shift in the publishing world has raised many of the technical and managerial issues that need to be debated for building roadmaps of the future for investors and other interested parties.

#### Technical Issues

- Improvement and enforcement of copyright protection
- Creation of compelling content using the available technology
- The ways to conduct financial transactions for micropayments

#### Management Issues

- Creating organization for online publishing
- Selection of business model to ensure success in different segments of online publishing
- Online customers satisfaction and the ways to keep the customers loyal

## **8.2 ONLINE PUBLISHING STRATEGIES**

The internet presents a mode of delivery, which may ultimately challenge the traditional perception of publishing. Publishers have used the web as a marketing tool and not as a method of distribution and selling. Investment has been in developing web sites as an advertising tool and not in the technologies and skills required for on-line distribution and payment of digital goods. Electronic publishing is used to compliment rather than replace traditional print products. However the growing interest in on-line media and the changing role of the end-user means publisher have to address their on-line and electronic publishing strategy if they wish to exploit this area for their enterprises. Following are the online publishing strategies that need to be considered by business firms:

**Early movers:** These are independent publishers who already have many of the necessary resources at hand and are highly skilled with existing access to such key capabilities as direct marketing and order fulfillment. Early movers have the capacity to derive the highest benefits from new media as their learning curves are much shorter than others.

**Watchers:** This category includes large publishing companies that employ scale-sensitive economics. Reduction in cost and widening of distribution is the only parameter to view online publishing as a sufficiently attractive channel for them.

**Testers:** These are multi-category and specialty publishers who are competing successfully in traditional markets, who are uncertain who will win in the online marketplace and who neither need nor want to make a choice now. For them, the online medium appears to be an alternative. They have already in place robust customer franchises and attractive distribution channels. These are the majority of publishers that face either attractiveness and/or skill challenges.

Publishers are learning about how the potential opportunities can be grabbed, what online publishing has to offer, how to explore the attractiveness of potential channels and how to build required skills so that they can quickly identify and react to changes with the industry. Content, incentives, service, quality, and price are not enough to compete in the

new technological environment. Speed of delivery, bundling of products, and diversity of choice also become critical success factors. New skills such as tailored advertising, order processing and fulfillment, and customer service are also required to be learned as to find why people subscribe.

### **Some Do's and Don'ts of Online Publishing**

Below are a miscellaneous collection of guidelines that can be used in preparing online publications. Some of them are purely practical rules, others more philosophical.

- Make the page layout simple, nice to look at, and easy to read on a monitor. Spare people from eye strain: use a clear font size and color.
- Use graphics to catch the reader's eye and to illustrate an idea or theme in the article. Avoid the clutter of too many graphics.
- Don't use frames unless it "really" is the best way to help readers navigate through the site.
- Try to respond to all e-mail, even if it is a kid in school who is treating publisher like an information-machine that will feed him data for his report. Even a one-liner can be enough as a polite, humane reply.
- Remember that "making money" is not the only way a publication can be valuable to a publisher. There is more to an author's life than royalties.
- Register publication with the major search engines.
- Use spell-checker.
- Test your pages on all the major browsers and platforms. A page may look wonderful on one's computer, yet come across as a mess on someone else's.

### **8.3 ONLINE PUBLISHING APPROACHES**

Following are the four contrasting content publishing approaches:

1. The Online Archive Approach
2. The New Medium Approach
3. The Publishing Intermediation Approach
4. The Dynamic and Just-in-Time Publishing Approach

**The Online Archive Approach:** This approach include bibliographic databases and full-text search/retrieval services already existing in digital archive of the corporate publishers, and, to some extent of commercial publishers such as academic or journal publishers that is desired by them to be delivered over the web as well as on paper, CD-ROM, or other media.

Library catalogs and bibliographic databases are the most prevalent example of online archive approach. Traditional card catalogs are being replaced with sophisticated electronic online bibliographic databases in most of the libraries and offering an incredible range of functions. MEDLINE, developed by the National Library of Medicine (NLM) is a bibliographic database that caters to an increasing number of physicians who rely on online medical databases to keep updated with the latest developments and literature. Other medical databases are also available free of charge on the internet.

**The New Medium Approach:** This approach includes real-time news delivery, personalized news delivery, and edutainment. It aims at creating new material for web by the publishers to float their own material considering web as a medium. Commercial print publishers such as magazines view the web as an alternative for their print publications but not as a replacement. Some writers may write for both media, but separate content streams will be developed for each medium.

Presently, this approach is facing some technological problem such as formatting on the web and expected to overcome in the near future through technological advancements. Apart from these technology constraints, the expectations of the web are also different from print media. It requires new contents, written for web audience, must be created. But as these contents are out, they are no longer been owned and there is a loss of intellectual content. So all the publishers try to be the initiator with the most interesting stuff on the web for creating a platform where web audience can see what the world has to say on a minute-by-minute basis.

**The Publishing Intermediation Approach:** This approach includes online directories, exploits new service opportunities for intermediaries. There is always a need for a good directory to help people locate goods, services, and products. Publishing intermediaries offer ease of operation, speed and detailed information to the customers and so are always in demand. Yahoo (Yet Another Hierarchical Officious Oracle) created in 1994 by David Filo and Jerry Yang specializes in providing the service and has emerged as key player. Yahoo is at the first place millions of internet users go when they try to find their way around the rapidly growing internet. It helps in creating a marketplace for conducting e-commerce through internet. Customers can find more companies, products, and services on the sprawling network.

**The Dynamic and Just-in-Time Publishing Approach:** In this technological environment, contents can be created in real-time and transmitted to the users' location even in the format according to their tastes and preferences. The elements of these dynamic contents are text, graphics, video, and sound which are stored separately in a database. The content engine recognizes repeat visitors to a site and configures the web pages to match the individual's known preferences. Publishers need not to author and update a large product catalog but create individualized pages for each user browsing the site on internet.

Dynamic publishing can also be seen in the form of just-in-time publishing. As and when the consumers need stories, applets etc. into the computer, get the content flow just-in-time, and then these dynamic contents self-destruct after usage. One question arises how payments are collected on a product by a business operating in small-amount transaction market. Publishers and developers should be thinking about micropayments which are essential for this marketplace. For low-value payments to work, transaction costs must be very small.

These various types of the online publishing approaches have some specifics that need to be discussed.



### **Full-Text and Bibliographic Databases**

This is the fastest growing publishing sector of the online publishing industry. Trade publications and news-papers information are stored in these databases. In full-text electronic publishing, several brand names such as LEXIS/NEXIS, DIALOG, NewsNet etc. occupy a position and provide news transcripts, professional journals, magazines etc. online every month. One of the famous full-text databases is LEXIS/NEXIS.

**LEXIS/NEXIS:** The legislation and court proceedings in full-text of U.S. and United Kingdom are stored in the LEXIS which was launched in 1973. It also provides the full-text French law and statutes. The students, large law firms, law libraries, financial institutions, and government agencies use LEXIS. It has become the norm in legal research and students of law are given free subscription as an introduction to the service. NEXIS has a broad spectrum of users. News, magazines, newsletters, journals, and other information sources are provided in the form of text by NEXIS to news media and researchers, academic and professionals who are the largest user categories.

LEXIS/NEXIS collectively include millions of full text documents ranging from Supreme Court Decisions to international business, scientific and financial information. The usage of LEXIS/NEXIS is growing rapidly among researchers and students who need access to its vast up-to-date database to do research.

**Securities and Exchange Commission (SEC) EDGAR Database:** It contains the world's most valuable collection of financial data of U.S. companies and provides access to corporate documents such as annual reports to describe financial well-being to the financial and investor community, brokerage houses, law firms, and institutional investors.

### **Personalized and Customized News**

Customers want the personalized electronic news on their specified schedules to access on-demand. This selected information is delivered from a large variety of news and

information sources by the service providers in real-time to PCs and workstations through automatic news filtering to the users.

**News Delivery as an Important Market:** As readership trends are slowly declining and the news industry is moving to decrease its reliance on cash flow from paper-based segments, companies have come to depend more on electronic publishing and news on-demand services. These services combine video, audio, text, and graphics in a format that permits browsing, searching, and user-notification on breaking news. Users are able to retrieve the information they need at any time. To meet the needs of personalization, real time news publishers must understand and gain expertise in the information packaging business, which has traditionally been the purview of the news media.

### **Business Information and News Delivery**

The increasingly competitive industry environments growth in the amount of available information and requirements to improve the quality and timelines of the information has led the business information service market to undergo significant change. Business information is needed to be more current, timely, and easy to access and use. The decentralization of decision making and accountability has also created a need for the widespread distribution of business information to workers at different levels within the organization.

### **Edutainment = Education + Entertainment**

Edutainment is a combination of entertainment, education, and games that engages users in an interactive learning experience that mixes video, graphics, music, voice narration, and text. Edutainment systems are designed for specific age groups and cover a range of subjects including mathematics, reading, learning, writing, history, and geography. The purpose of these edutainment programs is to make a student active rather than a passive learner. Interestingly, edutainment systems are not so much popularized till now. Whereas games such as ID Software's Doom, Doom II, and Heretic are very successful those were initially distributed on the internet.

## **Benefits and Opportunities of Online Publishing**

Electronic commerce offers benefits to both the publisher and the consumer. Publishers can develop new and customized products, as well as create new markets. Thus they are able to create new business, reduce costs and increase competition. The consumer benefits from increased choice, ease of access, possible price reductions and a better standard of service.

The products identified for successful electronic commerce are journals, magazines, newspapers and on-line databases. Most users subscribe to on-line newspapers and magazines or have them free for charge. In the academic environment on-line electronic journals are available to users via the library OPAC. Electronic journal provision is very costly to academic libraries. Although this is a service appreciated by students and academics the choice is limited and dependent upon the contract negotiated between the publisher and the library. The journal is usually the electronic version of the printed work; therefore convenience is the only benefit. A solution to this problem would be to establish an electronic commerce network for academia managed by the university library. The network could consist of university libraries, publishers and the funding bodies. Users could pay on a pay-per-use basis and the payments could be collected using electronic commerce technology. The premise being that funding is allocated for this purpose. This process would have to incorporate devices for tracking copyright and usage. Many “pure” electronic scholarly journals are now available free of charge on the web, however it is not certain how long this situation can last. These journals provide an excellent medium of communicating scholarly information. Quality is also of a premium as the journals are peer reviewed.

Due to the high costs involved most subscribers to on-line databases are large commercial organizations or reference libraries. This eliminates access to smaller firms and individuals who might only require a one-off journal article or report. There are two ways of approaching this problem using electronic commerce technology. Firstly database providers allow customers the option of paying for one-off items without incurring subscription and dial-up charges. By allowing access via the internet database

providers could allow individuals to purchase an electronic product using credit or debit card technology or by allowing them to set up individual accounts using suitable model. The second method would enable the consumer to go straight to the creator of the product and make the purchase in the same way. By doing so the storage, delivery and distribution elements of the information chain are eliminated. These processes require an appropriate business model, which can accommodate on-line commerce.

#### **8.4 ADVERTISING AND ONLINE PUBLISHING**

Advertising is an attempt to disseminate information in order to effect a buyer-seller transaction and to customers to buy a certain product or service. The traditional advertising was impersonal, one-way mass communication or mass marketing whereas internet has enabled consumers to interact directly with advertisers and advertisements with a click of mouse on an ad for more information. The internet has provided the sponsors with two-way communication and e-mail capabilities, as well as allowing the sponsors to target specific groups on which they want to spend money from their advertising budget, which is more accurate than traditional one. One more aspect of internet is that it enables a truly one-to-one advertisement. These prospects of internet advertisements have attracted the magazines, and news papers, to float their sites on the web. Online periodicals also have shown interest in including traditional advertisements as well as icons, which display an advertiser's logo and when clicked with a mouse, send a user across the web to the advertiser's web site.

**The web is very different from television:** Web is mainly a cognitive medium, whereas television is mainly an emotional medium. This makes television much more suited for the traditional type of advertising which is flashy and promotes superficial qualities of products. While watching television, people approach a vegetable state and the main goal of a commercial is to minimize interaction by keeping the user's hand off the remote control. As long as the user watches, advertisers can keep them engaged by high production values and a message that says very little besides "we are good."

Where television is warm, the web is cold. It is a user-driven experience, where the user is actively engaged in determining where to go next. The user is usually on the web for a purpose and is not likely to be distracted from the goal by an advertisement (one of the main reasons click-through is so low). This active user engagement makes the web more cognitive, since the user has to think about what hypertext links to click and how to navigate. This again makes the web less suited for purely emotional advertising. The user is not on the Web to “get an experience” but to get something done. The web is not simply a “customer-oriented” medium; it is a customer-dominated medium. The user owns the “Back” button. Get over it: there is no way of trapping users in an ad if they do not want it.

The current slow download times work against emotional advertising. A pure branding message may work when embedded in the high production values of a television commercial that can be viewed without any delay and without any action on the user’s part. On the web, everything is slow, and people don’t like waiting for a fancy brand message.

### **Reasons for Advertising on Internet**

There are several reasons why companies spending more on internet advertising.

- Use of internet is growing very rapidly.
- Ads can reach very large number of potential buyers globally.
- Internet ads are cheaper in comparison to television, radio, or newspaper and can be updated any time with a minimal cost.
- Internet advertising is interactive and targeted to specific groups and/or individuals.
- Increasingly valuable information: With more available information about the product description in online advertising, the decision to purchase on the part of consumer is easier. Thus more purchases can occur.
- Reduced access fees: Advertisers cover a part of the internet access fees that usually user has to pay. This reduced access fees can attract new internet users.

- Increasingly convenient access to information: With the increase in online information, advertisers should get users to their sites quickly by paying more for placement in online periodicals.
- Shorter access times: High bandwidth available to user provides more time on websites than waiting to access them. Less access time also enables to place complex graphics on websites without requiring additional access time. With more time available to draw user's attention, advertisers should be willing to pay more per user to place their icons in online periodicals.
- Better measurement of advertising effectiveness: Organizations are willing to pay more if online advertising persuade users to shift a portion of their purchase to the web. However, without determining advertising rates and the appeal of products, advertisers may not be able to measure advertising effectiveness so as to justify the cost of promoting a website, and placing a site linked icon in an online page.

Advertising spending is the amount that advertisers pay to other web sites such as periodicals and games to display their icons or product offerings. Though internet advertising is continuously gaining popularity, online publishers need to measure how much money has to be spent on advertising because of the following reasons:

1. What advertising expenses need to be counted is not defined clearly.
2. The market is too small to justify the cost of measuring its size.
3. The market is changing too rapidly to develop an effective means of measurement.

Researchers indicate that only 10 percent of web surfers currently click on ad banners. As internet advertising rates are usually determined by the size of a site's overall audience, less revenue is expected to generate for web sites.

### **Measurement of Effective Online Advertising**

There is an old saying in advertising that "I know half my advertising dollars are wasted - I just don't know which half!" But, on the web, advertisers do know, since they can track

how many site visitors come from which ads. As a matter of fact, advertisers can continue tracking the users as some of them change from site tourists into paying customers. Only loyal users have lasting value for the site.

Measurement of online advertising effectiveness is presently at a fairly immature state. Determining the objectivity of amount spent on a specific ad in traditional advertising is very difficult in terms of the sales of products or services and profits generated by it. Internet technology makes it easier to justify the cost of advertising as advertisers can get information in the form of electronic trail about where the users came from, what they did at a site and whether they purchased a product from the website. This electronic trail may enable advertisers to identify and correct problems with their advertising. Web advertising should be valued in terms of the value of the business it creates from the new users it attracts to the site. This value is usually very small, which is why web advertising works poorly and (while not completely useless) will be one of the smallest contributors to the future of the Web.

In theory, the main benefit of the web as an advertising medium is its measurability. Unlike a billboard, it is possible to measure when someone has seen an ad. Unlike television, it is possible to tell when someone has bought a product as a result of seeing the ad. Real life is harder than theory. It is not easy to measure web advertising and there is no single solution to the problem. Each step of the web advertising process requires different measurement tools and techniques and there are challenges at every step.

Sampling tools can report on measures of branding, such as unduplicated reach and frequency of exposure. Survey-based planning tools can also report on users' subjective experience of the campaign, measuring recall and brand attitudes. There is a longstanding religious debate about the importance of branding vs. direct marketing in web advertising. While branding is part of the goal of web advertising, direct marketing is a larger part. Web marketers want to increase and improve customers' perception of their company, but most marketers evaluate web advertising by its effectiveness at driving traffic and generating customers.

Ad networks provide post-click tracking services which let an advertiser see whether a customer has clicked through from an ad and then whether that customer has bought or registered. These services typically use single-pixel GIFs that report back to the ad server when a customer clicks through to a site, when they reach key pages, and when they have completed a purchase. Information about the purchase is passed back through the URL of the buy-page. Using cookies, these systems can even tell when the same visitor has returned to the site several days later to buy.

The reports from these network-based systems allow advertisers to compare results for different pieces of a campaign - by ad, or by site, or by target audience. Advertisers can assess performance by a variety of measures, including impressions, clickthroughs, and registration or sales conversions. When cost information is plugged in, the system can calculate the ROI for an advertising campaign.

Reporting systems provided by advertising networks have an important advantage that they give advertisers pinpoint control over the ad. An advertiser can look at a campaign report, see that a particular banner or site is performing miserably, and change the ad or the allocation. However, this approach also has weaknesses. Because these reporting systems often are not tied directly into the site's commerce server, they are limited in the amount of information they can gather about the transaction. For example, they might pick up the amount of the sale, but not the number of products purchased, or the type of products. Also, without talking to the site's registration system, it is harder for a network-based system to track unique visitors when they return to a site.

Moreover, reporting systems that are based on an advertising server only track the effectiveness of ads, they don't pick up referrals from affiliate programs, keyword searches, partner site referrals, and other parts of an interactive marketing strategy. The same limitation is true of affiliate reporting services.



Measurement systems based at a web site, on the other hand, are able to track customers' entry to the site from many sources: advertisements and affiliates, search terms and partner links. Web site-based measurement systems are able to tie into the site's commerce server and report directly on the amounts and types of products purchased. Site-based tools can tie into the site's user-tracking and registration database, reporting when a customer buys days or weeks after visiting the first time. Site-based tools can provide customer segmentation capability, enabling marketers to evaluate the results of ads based on criteria that are meaningful to the site. Finally, and most important in the long run, site-based marketing data can be analyzed along with offline marketing and cost data within the company to provide a picture of the lifetime value of the customer. Ultimately, this is the critical calculation that tells the business whether the customer has been acquired profitably. The chief drawback of site-based measurement systems is that they don't give advertisers a chance to adjust campaigns in real time.

### **Methods of Measuring Ad Visitors**

There are many ways that ad traffic, effectiveness and exposure are calculated. Here are some of the most popular methods.

**Click-through rate:** The percentage of viewers who clicked on a particular ad versus the total number of viewers who were exposed to that ad. It measures the amount of immediate responses generated by an ad.

**Conversion rate:** The percentage of viewers who take a desired action, including service subscriptions, downloads, registrations or sales. It entails any action other than browsing.

**Hits:** Total number of requests for delivery of a file on a server. It is an unreliable way to measure ad-generated traffic. When a user requests a page, that web page along with any graphic or textual elements are each counted as a hit.

**Impression:** The number of times a specific ad is downloaded, and therefore the number of exposures. The impression count does not count a user's repeat visits during the same session.

**Page View:** A record of each time a page is requested by a viewer. It is similar to a hit, but additional elements of a page are not counted separately. A high page view rate is good for Web sites that rely on advertising as a major source of revenue.

**Unique Visitors:** the number of separate individuals who visit a site within a specific time period, regardless of repeat visitors. This rate is usually calculated over a 30-day span. Unique visitors are determined by the user's IP address and cookies.

## **8.5 SUMMARY**

Exciting technology without relevant content can not drive profits or capture market share. More attention is needed towards tricky delivering of content for successful online publishing. In the offline business, publishers charge large advertising fees from the firms by offering mass markets for delivering message. This concept is not practical in online marketplace where instead of mass marketing, one-to-one marketing is considered.

Brand development is important because every time a user sits in front of a web browser needs to make decision about where to go. The better the brand, more likely it is to popup in the consumer's mind. One more important aspect in online publishing relates to digital copyrights. The internet makes it extremely easy to copy, retransmit, and alter works without the permission of the copyright holder.

It is important that publishers identify the product they are selling and its suitability for on-line delivery. Electronic goods consist of electronic journals, magazines and newspapers, electronic books, multimedia CD-ROM, software, computer games, music, and online databases. Internet and web recently have brought online publishing from a niche target audience to a mass audience. Many publishers are now ready to embrace the potential of the web as a method of publishing and distribution rather than as a purely

marketing tool. Surprisingly, the advertising world has also come under the attention of publishing community with the fast adoption of internet and web. Advertising industry has been relatively untouched by technology. Advertising agencies have been notoriously resistant to change in the past, and their reaction to advertising on interactive media has been no exception. These agencies have to embrace the new media to be relevant to their clients.

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## **8.6 KEYWORDS**

**ISP:** Internet Service provider, the company who provide internet services to users

**MEDLINE:** MEDLINE, developed by the National Library of Medicine (NLM) is a bibliographic database that caters to an increasing number of physicians who rely on online medical databases to keep updated with the latest developments and literature

**LEXIS/NEXIS:** The legislation and court proceedings in full-text of U.S. and United Kingdom are stored in the LEXIS. News, magazines, newsletters, journals, and other information sources are provided in the form of text by NEXIS to news media and researchers, academic and professionals

**YAHOO:** Yet Another Hierarchical Officious Oracle, a famous portal and search engine

**SEC:** Securities and Exchange Commission (SEC) EDGAR Database that contains the world's most valuable collection of financial data of U.S. companies and provides access to corporate documents

**EDUTAINMENT:** Edutainment = Education + Entertainment, Edutainment is a combination of entertainment, education, and games that engages users in an interactive learning experience that mixes video, graphics, music, voice narration, and text

## **8.7 SELF-TEST QUESTIONS**

1. Why should online publishing be considered by corporate managers?
2. What are the main products of online publishing?
3. Describe the issues involved in online publishing.
4. Give a brief note on online publishing strategies.
5. What do you understand by Web Advertising? Discuss the main reasons to prefer internet for advertising.
6. How web as a media is different from television for online advertising?
7. Write a detailed note on measurement of advertising effectiveness on web.

## **8.8 SUGGESTED READINGS**

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# **LESSON: 9**

## **DIGITAL COPYRIGHT**

**Subject: E-Commerce**

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### **STRUCTURE**

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- 9.1 Introduction
- 9.2 Economic Aspects of Digital Copyright Protection
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### **9.0 OBJECTIVES**

In this age of the internet and the speed of technological development has outpaced the legal system and that digital copyright issues need to be resolved with urgency.

After going through this lesson, you will be able to:

- Explain concept of copyright
- Identify the various issues involved in copyright.

## **9.1 INTRODUCTION**

Copyright is a form of protection provided by the laws of the United States (title 17, U.S. Code) to the authors of “original works of authorship,” including literary, dramatic, musical, artistic, and certain other intellectual works. This protection is available to both published and unpublished works. Section 106 of the 1976 Copyright Act generally gives the owner of copyright the exclusive right to do and to authorize others to do the following:

- To reproduce the work in copies or phonorecords;
- To prepare derivative works based upon the work;
- To distribute copies or phonorecords of the work to the public by sale or other transfer of ownership, or by rental, lease, or lending;
- To perform the work publicly, in the case of literary, musical, dramatic, and choreographic works, pantomimes, and motion pictures and other audiovisual works;
- To display the copyrighted work publicly, in the case of literary, musical, dramatic, and choreographic works, pantomimes, and pictorial, graphic, or sculptural works, including the individual images of a motion picture or other audiovisual work; and
- In the case of sound recordings, to perform the work publicly by means of a digital audio transmission.

In addition, certain authors of works of visual art have the rights of attribution and integrity as described in section 106A of the 1976 Copyright Act. These rights, however, are not unlimited in scope. Sections 107 through 121 of the 1976 Copyright Act establish limitations on these rights. In some cases, these limitations are specified exemptions from copyright liability. One major limitation is the doctrine of “fair use,” which is given a

statutory basis in section 107 of the 1976 Copyright Act. In other instances, the limitation takes the form of a “compulsory license” under which certain limited uses of copyrighted works are permitted upon payment of specified royalties and compliance with statutory conditions.

## **9.2 ECONOMIC ASPECTS OF DIGITAL COPYRIGHT PROTECTION**

Intellectual property laws are typically linked to a discussion of the values of intellectual creativity and society’s use of information and ideas. Nevertheless, they are fundamentally economic measures and their implementation and enforcement can and indeed should be evaluated in terms of their effectiveness in achieving desired market changes. In this chapter, we do just this. The ultimate end of intellectual property laws is to promote the creation of knowledge and useful arts. This goal, however, cannot be achieved without incentives, which most often are economic. We examine the issue of digital copyright by focusing on the law’s intention to protect the market for copyright owners. Therefore, any measure to enhance digital copyright has to be evaluated in terms of how well it accomplishes this. Nevertheless, far more than the use of legal and artificial market barriers, this chapter advocates the essential role of strategy in resolving the copyright debate.

The most efficient allocation of resources is obtained when markets are competitive; in other words when prices are determined by demand and supply and fully reflect the cost of producing a good, its opportunity costs, and society’s valuation for the good as well as other uses of the same resources. To achieve maximum efficiency, the market forces must not be inhibited by external measures such as taxes, artificial barriers to entry, and other measures that affect the level of market power of either sellers or buyers. Copyrights and patents seem to directly contradict this by giving authors and inventors a limited monopoly right over production and distribution of a good. Why then do we need to give artificial monopoly rights to authors?

The need to protect intellectual properties to the extent that we abandon competitive market mechanisms has less to do with the fact that we value creativity so highly but



because ideas, once discovered and put into words and other physical forms, can be easily copied, often without incurring additional effort and time. To those who believe that human creativity belongs to humanity or society, this is an added advantage that makes disseminating ideas easier. However, in an age of information, producing ideas has become the most important economic activity, and ideas consume enormous resources and time to produce. In other words, ideas and intellectual properties have become investments that must be remunerated.

Disseminating ideas is desirable and necessary for the prosperity of a society. For example, teaching a new and improved farming technology to neighbors increases overall agricultural production without restricting the inventor of the new method from reaping benefits on his/her own land by using the same technology. While ownership of physical properties such as land must be clearly defined to prevent inefficient use, intellectual properties are often more valuable if shared. However, once ideas are written down in physical forms which are then traded, the ownership right of an idea and its physical manifestations in various forms becomes an economic issue, first set forth formally in the copyright legislation of the 16th century.

### **9.3 ECONOMIC HISTORY OF DIGITAL COPYRIGHT**

Copyright is a by-product of the mass printing process, improved literacy, and market incentives for profits. Its statutory specifics have historically evolved in the context of the book trade, emphasizing the “property” aspects over the more “intellectual” perspective. In today’s age of information and digital products, much fear that copyright laws which were formulated to regulate the book trade are grossly inadequate, pointing out that digital media are fundamentally different from the paper medium in both production and distribution. As the printing press forced the society to re-think about intellectual properties four centuries ago, the digital communication again compels us to reevaluate the purpose and practice of copyright laws.

In an effort to continue to protect authors’ rights in the digital era, new technologies and tools are being developed specifically to control digital communication. However, the

development of a comprehensive implementation scheme for digital copyright must grow out of the overall purpose of such measures, and will be judged by its effectiveness in fulfilling any agreed-upon function of copyright law. In order to better understand the rationale for copyright protection, we review how two strands of thoughts regarding intellectual properties—property rights vs. authorship rights—have developed along with the modern publishing industry. The property rights approach sees the objective of a copyright law as guaranteeing market and revenues for authors and thereby promoting a continuous supply of high quality products. Followers of this approach regard current copyright laws to be adequate, and focus on developing new technological means of auditing, identifying, and measuring digital flows accompanied by vigorous enforcement of the laws. On the other hand, the authorship rights approach considers the fundamental function of copyright to be protecting authors' moral rights to their creation so that a stricter mechanism is needed to control all aspects of viewing, storing, retrieving, altering, reproducing, and transmitting their creations. Whether these products are marketable or not will be immaterial. Followers of this approach believe in redefining copyright for digital products and modifying or strengthening copyright statutes.

#### **9.4 THE PROPERTY ASPECT OF DIGITAL COPYRIGHT**

An idea, knowledge, or intellectual activity as an economic property is a relatively modern invention. It is quite clear that laws governing property give an owner the exclusive right to possess, use, and transfer property and other objects that are connected to or derived from that property. But while physical properties such as an acre of land or a house can be clearly defined, what is an intellectual property? In order to establish property rights, we need to first identify a) the owner and b) the property. The owner of an intellectual property is the author. But because of its intangible nature, ownership cannot be established over an idea, and thus property rights are awarded to the physical expression of the author's idea such as a book.

Despite being called 'property,' intellectual properties are obviously quite different from tangible properties, and therefore legal protection and prosecution based on copyright law are substantially different from other property laws. This difference was highlighted in

the computer hacker case of *U.S. v. Riggs* in 1990 (Godwin 1994). The prosecution tried to apply ITSP (interstate transportation of stolen property) (18 U.S.C. 2314) statute to a computer hacker who made an unauthorized connection to a regional telephone operating system, copied its emergency 911 procedure and distributed it, ultimately publishing it in a magazine. Instead of applying copyright or trade secret laws, the prosecution used ITSP statutes mistakenly believing that property theft law also applied to intellectual properties. Admittedly, ITSP was wrongly applied; a law governing trade secrets—against which federal and state criminal laws have been enacted or modified to address online cases—or wire-frauds might have been better suited.

However, the Supreme Court had previously stated that copyrighted material does not meet the scope of ITSP, which applies to tangible items. In the case of copying a computer file, there is no physical seizure of an item or transport of that good. Simply put, the emergency 911 file was left on the host's computer, and only a copy was transmitted. In this way, unauthorized copying is substantially different from a theft protected by ordinary property statutes.

Even generic theft statutes are found to be irrelevant in the case of unauthorized copying. Again, theft involves physically taking an object, the remedy to which may be recovering that object. Copyright, on the other hand, does not protect the property itself, but rather the interest of the authors, especially the market or profit interests. If a book is stolen from a publisher's warehouse, for example, property laws governing theft or stolen property may apply, but pirated copies are not theft protected by generic theft statute. Instead, the violation is termed "infringement" of the publisher's interest protected by copyright. This difference is illustrated by the fact that while stolen property is recovered, pirated copies are destroyed. It is important to recognize that, economically speaking, intellectual properties are not properties—as tangible commodities—despite the misleading term, and intellectual property laws do not protect the said property, but the interests of the owners derived from the use of that property—although this interest may very well be termed as "property" in legal sense.

The first known copyright theft occurred when Hermodorus copied Plato's speeches and sold them overseas. Was this a crime? If there were a law prohibiting speech transcription and selling, Hermodorus might have been a criminal. But the fact that there was no such law indicates that Plato and his compatriots did not recognize a potential for profit in selling the speeches. What limited the market for speeches was the lack of suitable technology for producing copies. Even during the Middle Ages, "unauthorized" hand-copying was an important part of monastic life. The primary utility of these literary works was to communicate ideas to readers. Disseminating ideas through hard-working monks was more important than any profit consideration of the authors.

When Gutenberg's printing press changed the publishing industry in the 15th century, a larger market began to appear for printed works. With mass printing, the profit potential from mass marketing was recognized and, almost immediately, some works were "popular" enough to be pirated. The idea of proprietary ownership was quickly extended to copies as well as to the original manuscript, hence the term "copy right." At this time, however, the property right was applied to bound copies of books, and publishers rather than authors controlled legal rights over publication and distribution.

This is logical if we consider that books and copies were perceived to be properties of trade, and that the first copyright laws aimed to regulate no more than the trade aspects of book publishing. For example, the Royal Charter, given to London-based Stationers' Company in 1557, granted a monopoly right to publishers. The Royal Charter was a precursor to modern copyright laws and established the "property" aspect of printed works. Once registered and printed, a book became the property of the publisher. In this way, what the Charter protected was the market, or the profit-making trade. The fact that books were based on intellectual activities was not yet a consideration. Despite the growing recognition of authorship rights and the importance of knowledge and ideas, modern copyright laws still maintain this aspect of trade regulation.

The monopoly, however, broke down as the demand for books and regional piracy increased substantially and the market regulation based on the Charter became ineffective

and was abandoned. By 1710, publishing and book trade was an important profit-making activity, and interested parties demanded statutory protection of their rights to secure markets for their properties. England's Statute of Anne in 1710 laid down the first terms of copyright, limited its application to fourteen years, and set out infringement penalties. Although the Statute also professed to protect impoverished authors during the Age of Enlightenment by signaling the assertion of their rights, the Statute met with vigorous piracy originating in Scotland and Ireland. This prompted a series of copyright laws that modified and strengthened the terms of copyright protection. It is also important to remember that illegal copies became an issue only when reproduction technology became sufficiently advanced. The invention of printing presses, photocopiers, and now digital copying technologies has periodically brought the issue to the forefront. But the market environment has not changed significantly, and the digital marketplace does not present any new issues that demand a complete revision in intellectual property laws as some have argued.

Since the Statute of Anne, three major developments have occurred in modern copyright laws. First, the intrinsic rights of authors have become increasingly recognized. Second, the recognition that foreign market piracy is a substantial economic issue has resulted in international copyright agreements. And third, since knowledge became the most important economic asset during the Industrial Revolution, modern laws have extended their protection to all types of intellectual properties. The attempt to balance private property rights against public benefits in order to stimulate economic development has frequently resulted in clashes between the right of the author and the right of society.

## **9.5 THE AUTHORSHIP ASPECT OF DIGITAL COPYRIGHT**

Once an idea is attached to a physical object, for example when it has been set down on paper, establishing the ownership of that object is a legal question that most legal regimes are quite accustomed to dealing with. Throughout the history of copyright laws, the ownership right to an object to which an idea is attached has been a far less contentious issue than the question of authorship right to an idea. For example, when one wrote down public speeches of Plato, the manuscripts belonged to the transcriber, not the author,

Plato. The former could legally duplicate and sell the speeches. Historical records do not in fact show whether the author or the government objected to this practice or recognized the issue of authorship at all. When authorship is not asserted, copying speeches could by no means be considered an act of theft.

Due to the property aspect of intellectual properties, copyright laws have evolved as a trade regulation. However, intellectual properties have characteristics unlike other physical properties, and accordingly copyright laws are enforced differently. Damage awards for copyright theft, for example, are based on actual and potential market loss inflicted by the theft, not the recovery of the stolen property itself. In fact, as we have mentioned, stolen property, i.e. unauthorized copies, are destroyed, not returned. More importantly, ideas and knowledge have so-called public goods characteristics, where the social gains may outweigh the private gains if freely available. At an extreme position are those who believe that ideas cannot be possessed, confined, or exclusively appropriated. As Thomas Jefferson said, "Inventions cannot in nature be a subject of property."

As a result, the current debate on copyright protection in the electronic marketplace mainly centers on whether authors have the moral right to control every aspect of their works, or whether the public have the right to access this information. A clear understanding of this issue is needed before we can evaluate various positions on copyright protection in electronic commerce.

Modern copyright laws accept the premise that authors, who provide contents, should be rewarded. This represents the changing view that the main emphasis in providing copyright protection is not just "protecting the market" but "creating incentives." Although the right of authors was relatively inconsequential in early copyright laws, in the 18th century countries in Continental Europe began to advocate natural and moral rights of creators as inalienable rights. In today's age when the expressive medium is no longer limited to paper and proprietary characteristics have become uncertain, authorship of an idea takes on even greater significance.

While proponents of authorship emphasize the maximization of author's rights in controlling all aspects of their intellectual properties, this contradicts a professed goal of intellectual property right laws in promoting society's welfare. A sale of a book entitles the buyer to rent, resell, and give it away as he/she sees fit, even though that will prevent the content owner from selling another copy. Because copyright, in the age of printing, was primarily a property law, the first sale doctrine applies even though the content owner does not transfer the copyright through the sale. Furthermore, various uses of copyrighted works are considered to be "fair" if those activities benefit society. Even when there is no dispute regarding payments, copyright holders often lack means to monitor and control such activities. For example, ASCAP and BMI rely on a complex formula to determine payments for copyright holders since counting every instance of broadcast and performance will be impossible. However, digital technologies and the electronic marketplace give content owners means to control and monitor every aspect of consumer usage. As a result, the desire to control copyrights often coincides with the intent to maximize authors' moral rights giving content owners unrestricted control over their creations.

## **9.6 DIGITAL COPYRIGHT SUBJECT MATTER**

A "copyright" exists in any original work of authorship fixed in a tangible medium. That medium can be almost anything, including paper, computer disk, clay, canvas, and so on. For a work to be "original," it must meet two qualifications:

- (1) it cannot be copied from another work; and
- (2) it must exhibit at least a small amount of creativity.

Copyright lasts for the life of the author and 70 years thereafter.

## **9.7 DIGITAL COPYRIGHT RIGHTS**

A copyright provides not just a single right, but a bundle of rights that can be exploited or licensed separately or together. The economic rights embraced within a copyright include the following:

- ***The reproduction right (the right to make copies).*** For purposes of the reproduction right, a “copy” of a work is any form in which the work is fixed and from which it can be perceived, reproduced, or communicated, either directly or with the aid of a machine. Courts have held that even the reproduction created in the short-term memory (RAM) of a computer when a program is loaded for use qualifies as a copy.
- ***The right to create adaptations, or derivative works.*** A “derivative work” is a work that is based on a copyrighted work, but contains new material that is original in the copyright sense. For example, the movie *Gone With the Wind* is a derivative work of the book by Margaret Mitchell. “Version” is not a term of art in copyright law. If a new version consists merely of the same work in a new form—such as a book or photograph that has been scanned to create a digital version—then it is a reproduction of the work. However, if new copyrightable authorship is added, then it is a derivative work. For example, *Windows 2000* is a derivative work based on *Windows 98*.
- ***The right to distribute copies of the work to the public.*** The distribution right is limited by the “first sale doctrine,” which provides that the owner of a particular copy of a copyrighted work may sell or transfer that copy. In other words, the copyright owner, after the first sale of a copy, cannot control the subsequent disposition of that copy. Making copies of a work available for public downloading over an electronic network qualifies as a public distribution. However, neither the courts nor the Copyright Office has yet endorsed a “digital first sale doctrine” to allow users to retransmit digital copies over the Internet.
- ***The right to perform the work publicly.*** To “perform” a work means to recite, render, play, dance, or act it, with or without the aid of a machine. Thus, a live concert is a performance of a musical composition, as is the playing of a CD on which the composition is recorded.



- ***The right to display the work publicly.*** To perform or display a work “publicly” means to perform or display it anywhere that is open to the public or anywhere that a “substantial number of persons outside of a normal circle of a family and its social acquaintances is gathered.” Transmitting a performance or display to such a place also makes it public. It does not matter whether members of the public receive the performance at the same time or different times, at the same place or different places. Making a work available to be received or viewed by the public over an electronic network is a public performance or display of the work.

The law distinguishes between ownership of a copy of a work (even the original copy, if there is only one) and ownership of the copyright rights. A museum that acquires a painting does not thereby automatically acquire the right to reproduce it. Libraries and archives commonly receive donations of manuscripts or letters, but they generally own only the physical copies and not the copyright rights.

- ***Not all rights attach to all works.*** For example, some works, such as sculpture, are not capable of being performed. Other works - notably musical compositions and sound recordings of musical compositions - have rights that are limited in certain respects. For example, reproduction of musical compositions in copies of sound recordings is governed by a compulsory license that sets the rate at which the copyright owner must be paid. Sound recordings, for historical reasons, long had no right of public performance, and they now enjoy only a limited performance right in the case of digital audio transmissions.

Even though works can be converted into mere 1’s and 0’s when digitized, they generally retain their fundamental character. In other words, if the digitized work is a computer program, it is subject to the privilege the law provides to owners of copies of computer programs to make archival copies. If it is an unpublished work, it retains the level of protection that attaches to unpublished works, as discussed in sections 4 and 8.

## **9.8 RELEVANT DIGITAL COPYRIGHT EXCEPTIONS**

Copyright rights are not absolute; they are subject to a number of limiting principles and exceptions. Those principles most relevant to the creation of a digital archive are as follows:

- a. The exception for certain archival and other copying by libraries and archives in section 108 of the Copyright Act. Libraries and archives are permitted to make up to three copies of an unpublished copyrighted work “solely for purposes of preservation and security or for deposit for research use in another library or archives.” The work must be currently in the collections of the library or archives, and any copy made in digital format may not be made available to the public in that format outside the library premises.

Libraries and archives may also make up to three copies of a published work to replace a work in their collections that is damaged, deteriorating, or lost, or whose format has become obsolete, if the library determines that an unused replacement cannot be obtained at a fair price. Copies in digital format, like those of unpublished works, may not be made available to the public outside the library premises.

Even if copying a work is not expressly allowed by section 108, it may still be permitted under the fair-use doctrine. However, the privileges under section 108 do not supersede any contractual obligations a library may have with respect to a work that it wishes to copy.

- b. Fair use is the copyright exception with which people are often most familiar. Whether a use is “fair” depends on the facts of a particular case. Four factors must be evaluated when such decisions are made. The first factor is the purpose and character of the use. Among the considerations is whether the use is for commercial or for nonprofit educational purposes. Works that transform the original by adding new creative authorship are more likely to be considered fair use than those that do not; however, even a reproduction can be considered a fair use in some circumstances. The second factor is the nature of the copyrighted work. The scope of fair use is

generally broader for fact-based works than it is for fanciful works, and broader for published works than for unpublished ones. The third fair use factor is the amount and substantiality of the portion used. Generally, the more that is taken, the less likely it is to be fair use, but there are situations in which making complete copies is considered fair. The fourth factor is the effect on the potential market for or value of the copyrighted work. A use that supplants the market for the original is unlikely to qualify as fair.

Certain uses are favored in the statute; they include criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, and research. A nonprofit digital archive for scholarly or research use, for example, would be favored by the law. However, favored uses are not automatically deemed fair, and other uses are not automatically deemed unfair. The four factors discussed earlier must be evaluated in each case.

Some users become frustrated because there is no magic formula to determine whether a use is fair. However, the same flexibility that sometimes makes it difficult to predict whether a use will be considered fair also allows the statute to evolve through case law with new circumstances and new types of uses. A statute that provided greater certainty would inevitably be more rigid.

- c. Section 117 allows the owner of a copy of a computer program to make an archival copy of that program. This section, however, applies only to computer programs, not to all works in digital form.

## **9.9 WHO CAN CLAIM A COPYRIGHT?**

Anyone who creates a work covered by copyright law and fixes it on a substantially permanent medium automatically possesses the copyright. Under current laws, a copyright is obtained as soon as a work is created and fixed in a medium. Unlike patents, authors do not need to claim their copyright, register, publish, or give copyright notices on their work. Forms of copyright notice are optional for works published on and after

March 1, 1989. Through agreements such as the Berne Convention, copyright is acknowledged internationally as well, while patents have to be filed individually for each country. Unless a specific contract transferring the right is drawn up, the copyright belongs to the actual authors. Full-time employment may constitute such a contractual situation, known as “work for hire,” where employers may own the copyright for the material created. For other specially commissioned works for hire, a written and signed agreement is required.

### **9.10 OBJECTS COVERED BY DIGITAL COPYRIGHT**

U.S. Copyright Law (17 U.S.C.) grants copyright protection for works of authorship in the following cases:

- 1) literary works including books, magazines, news articles, manuals, catalogs, advertising words, computer software, and compilations such as directories and databases;
- 2) musical works including accompanying words;
- 3) dramatic works including accompanying music;
- 4) pantomimes and choreographic works;
- 5) pictorial, graphic, and sculptural works including maps and fine arts;
- 6) motion pictures and other audiovisual works;
- 7) sound recordings; and
- 8) architectural works.

**Terms of Copyright** For works created in 1978 or later, the term of copyright is the author’s life plus 50 years after the author’s death, and in the case of corporate-authored works, the term is 75 years after publication or 100 years from creation. Although works created before 1978 were governed by different laws, such works were given a term of 75 years from their creation.

### **9.11 WORKS THAT CANNOT BE COVERED BY DIGITAL COPYRIGHT**

- 1) Works are not protected if they are not “fixed” on a sufficiently permanent medium. This requirement is lax enough to include hand-written or typed documents as “fixed” forms of authorship.
- 2) Only original works are protected. The “originality” requirement is also fairly flexible. Unlike patents, works dealing with the same subject or idea can be copyrighted as long as each work has a minimum degree of originality.
- 3) When works incorporate pre-existing material, only the original portion is covered by the copyright. If a journal contains articles copyrighted by individual authors, the act of collection is copyrighted as the original work.
- 4) Facts cannot be copyrighted. Therefore, compilations of names and address that are publicly available, such as the telephone book, cannot be copyrighted. To copyright such material and databases, copyright law requires a certain originality in selection, organization, and arrangement of the data. Even then, only the original aspects are protected; the facts still are not. Alphabetical ordering is not considered original. Similarly, expressions that have become standard techniques for creating a particular type of work are in the public domain.
- 5) Works in the public domain are not protected. Works can enter the public domain when their copyright expires. However, due to changing copyright laws, a careful evaluation is needed to determine whether a work is in the public domain. For example, previously a failure to renew or to give proper copyright notice resulted in the loss of a copyright. However, new laws do not require copyright renewal. Also, works created after March 1, 1989, do not need to include copyright notice, registration, or deposit to be protected under copyright law. Moreover, certain advantageous remedies are only available for infringements that occur after registration and deposit. Because of the Berne Convention, these formalities are not applicable to foreign nationals, and probably will have to be removed entirely from U.S. law before it is in full compliance with the Convention.
- 6) If a work is created by U.S. governments, it is automatically in the public domain since government works cannot be copyrighted. However, this only applies to federal governments. State governments can copyright their documents. Laws and legislation of both federal and state governments may not be copyrighted. The

only statutory exception is for data produced by U.S. Secretary of Commerce, which are copyrighted under the Standard Reference Data Act (15 U.S.C. 290e). A gray area is when U.S. governments provide funding for independent contractors. Such works are copyrighted by contractors, but the copyright can be transferred to governments.

## 9.12 GUIDING PRINCIPLES

The following core guiding principles for copyright laws:

- **Balance in Copyright Law:** Copyright law must serve the public interest by providing a reasonable balance between the rights of copyright owners and the rights of citizens to reasonable access to copyrighted works.
- **Primacy of the Copyright Act:** The rights granted to users of copyright content by the Copyright Act must not be allowed to be unilaterally overridden by contract. The contractual licensing of copyright works does not replace or fully achieve the public policy objectives of copyright law.
- **Technological Neutrality:** Copyright laws must remain “technology neutral” in the sense that the provisions they embody ensure that technological developments detract neither from the rights of copyright owners nor from the legitimate rights of users to have reasonable access to protected works.
- **The Right to Read:** Individuals must retain the right to read lawfully obtained copyright content.
- **The Right to Lend:** The non-profit public lending of legally obtained copyright content is one of the cornerstones of a democratic society and must be permitted to continue irrespective of the format of the content.
- **A Robust Public Domain:** A robust public domain is an essential element of an informed and participatory society.
- **Facts are Not Copyrightable:** It is essential that individuals maintain their ability to access and use facts. It would be inappropriate to extend a sui generis property right to compilations of facts.
- **Privacy:** The right of individuals and institutions to retain their privacy relating to choice of reading or research content must be protected.

### **9.13 MARKET PROTECTION THROUGH BUSINESS STRATEGIES**

By granting a monopoly power in the form of copyrights, society's intention is to protect an author's market from being eroded or stolen by others. When the market is not protected from pirates who do not share the initial cost of developing the product, authors have a reduced incentive to develop a product, at least for commercial reasons. This is the same argument used to advocate that academic research has to be funded by governments if quality products are desired since non-profit intellectual activities are not protected.

Our analysis based on product characteristics reveals that many types of products may actually make the copyright protection issue null and void, turning their vulnerability of easy modification into a means to increase profit through product differentiation. Clearly, a tight control over all aspects of copyrights is not always most efficient. If the result is the creation of complacent regulated monopolists, it may instead fail to give incentives to producers to update information or to develop interactive and innovative products. Also, from the consumers' point of view, personal arbitrage via reselling is an important leverage against sellers' price discrimination. A more balanced approach can only be achieved after considering all the economic implications in the market. For a practical and viable solution for copyright protection in the digital world, sellers and policy-makers need to consider the unique types of products and consumer usage. Depending on its type, some products may need more protection than others.

Interactive service providers clearly represent one end of the extreme with the least concern for copyright infringement. In actual fact, these services may not have applicable copyright protection in the first place. Among non-interactive products, time-dependent products represent the bulk of the primary information products available on the Internet. For these products, digital copyright does not need to be much different from non-digital copyright since the incentive for distribution is minimal, and because, even if there is some incentive, its effect on market will not be too great. Similarly, single-use products such as search results are personalized and situation-specific, and therefore of little value

to other people except the buyer. Other information products that are more valuable if few people have them will not be shared at all.

On the opposite end of the extreme are music, software and computer games. Digital copyright protection is critical for these time-independent, multi-use products. Nevertheless, sellers can still change consumer usage of these products so that they become time-dependent. As is evident in the physical product world, frequent updates and releases of new and improved versions help this process. Similarly, with some effective but not too cumbersome technologies, short-run duplication can be prevented. The current reluctance of content owners to digitize their products and sell them on the Internet has more to do with lack of technologies and security in transmission speed, payment system, and other market services, than with concern about copyright. In sum, an extensive revision of copyright laws is not warranted when product strategies based on consumer behaviors are implemented.

A separate issue exists in case of computer software. The gist of the issue is whether copyright or patent protection is more suitable to software. In general, the consensus seems to be that copyright is the most effective means to protect software. However, some software has been recognized as being used to bring new and useful functions that can be protected by patents. The debate involves comparing a number of different factors. Copyright applies immediately while a patent takes time to establish and is quite expensive to obtain. Also, a patent requires a great deal more in terms of originality than does a copyright. As a result, the protective right granted under patent law is in general stronger than that obtained under copyright law. This said, current laws are inadequate to deal with many facets of computer software and some argue in favor of a new mechanism to protect software (see Samuelson et al. 1994). The industry practices attempt to sidestep the whole issue of copyright versus patent protection for software by heavily using licensing agreements instead of sales to distribute the product. Through licensing, software vendors maintain the ownership of the product and can impose various restrictions regarding the use of their products. A proper legal protection for software would represent a legitimate instance to re-think copyright laws for electronic commerce.



## 9.14 SUMMARY

Copyright in the digital age has become one of the hottest issues affecting the future of electronic commerce. In the first place, the majority of digital products fall into the range of expressions protected by copyright law. An estimate by a computer software organization, although it has an obvious bias, puts the cost of piracy on and off the Internet at several billion dollars a year. An international effort to strengthen existing copyright laws was undertaken in December 1996 in Geneva for the first time in 25 years organized by the World Intellectual Property Organization, a United Nations agency in charge of the Berne Convention. On the other hand, the culture of the Internet as a free and unregulated communications medium has produced a strong counter-argument for increased public access to information. Consumer groups and a coalition of the free information movement criticize that the new copyright laws could retard the growth of the Internet and jeopardize the very future of electronic commerce they intend to protect. In this chapter, our focus has been to emphasize the economic significance of copyright protection. The ease in reproduction and distribution of any digital product has given rise to widespread legal and technical issues. In response, copyright laws are already reinterpreted and revised, while sophisticated technologies are being developed to control many aspects of the transmission and usage of digital products. However, since the ultimate goal of the copyright statute is to protect the market, and thus the remuneration, of a copyrighted work, any legal or technological solution should be evaluated in terms of how well it protects the market. Under that criterion, we found that certain product choice strategies such as differentiation and customization naturally discourage consumers from unauthorized reproduction and distribution of a digital product. Market driven solutions such as these avoid the use of legal and artificial market barriers, a fact that is desirable in terms of market efficiency.

## 9.15 KEYWORDS

**Copyright:** Copyright is a form of protection provided by the laws of the United States (title 17, U.S. Code) to the authors of “original works of authorship,” including literary, dramatic, musical, artistic, and certain other intellectual works.

**DIGITAL COPY RIGHT:** A copyright provides not just a single right, but a bundle of rights that can be exploited or licensed separately or together.

**ITSP :** Interstate transportation of stolen property

**IPR:** Intellectual Property Right

### **9.16 SELF ASSESSMENT QUESTIONS**

1. What is digital copyright? How digital copyrights are more useful in current scenario?
2. What are the marketing strategies for protection of copyrights?
3. Discuss the principles that guide the recommendations for copyright laws and forums.
4. Is copyright necessary? Justify your answer.
5. Elaborate property and authorship aspect of digital copyright.

### **9.17 SUGGESTED READINGS**

- Kalakota, Ravi and Whinston, Andrew B. “Electronic Commerce – A Manager’s Guide”, Pearson Education, Inc.
- Kalakota, Ravi and Whinston, Andrew B. “Frontiers of Electronic Commerce”, Pearson Education, Inc.
- Rich, Jason R. “Starting an E-Commerce Business”. IDG Books, Delhi, 2000.
- Samantha Shurety. “E-business with Net Commerce”, Addison Wesley, Singapore, 2001.
- Turban et al. “Electronic Commerce: A Managerial Perspective”, Pearson Education, Inc.

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# **LESSON: 10**

## **INTRANET AND SUPPLY CHAIN MANAGEMENT**

**Subject: E-Commerce**

**Paper Code: MM-409/IB-416**

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### **STRUCTURE**

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- 10.1 Introduction to Intranet
- 10.2 Advantages of Intranet
- 10.3 Disadvantages of Intranet
- 10.4 Introduction to Supply Chain Management
- 10.5 Features of Supply Chain Management
- 10.6 Components of Supply Chain Management
- 10.7 Bullwhip Effect and Supply Chain Management
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- 10.9 E-Marketplace
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- 10.11 Measuring Supply Chain
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- 10.14 ERP and Supply Chain Management
- 10.15 Summary
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- 10.17 Self Assessment Questions
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### **10.0 OBJECTIVE**

Supply chain has been viewed as an inflexible series of events that somehow managed to get products out the door. It often involved questionable inventory forecasts, rigid

manufacturing plans and hypothetical shipping schedules. Intranet and internet enhances supply chain performance and supply chain is crucial to e-commerce success. As the supply chain evolves in the information age, the Internet's capability to support tight coordination between business and channel partners.

After going through this lesson, you will be able to:

- Describe the concept of intranet
- Explain the concept of supply chain management
- Define various components of supply chain management
- Identify the reasons for Bullwhip Effect, and the methods to overcome its effect
- Illustrate advantages and disadvantages of internet integrated supply chain management
- Explore the relationship between ERP and supply chain management

## **10.1 INTRODUCTION TO INTRANET**

Intranet is a kind of system information which changes the paradigm of network computer today. Intranet using Internet applications to provide and access the information. Those applications are World Wide Web, Electronic mail, News group, File Transfer Protocol, Video conferencing, etc. As like as the Internet, which is a world wide network of interconnected computers, Intranet is used only in the internal networking in the organization. This internal networking can be LAN (Local Area Network) to WAN (Wide Area Network).

An intranet is a self-contained, internal network linking multiple users by means of Internet technology. In effect, intranets put a fence around the Internet's limitless territory, establishing controlled-access sectors within which users can communicate freely and interact. Built and managed by companies or organizations (called sponsors), these networks reside on the World Wide Web, enabling cross-platform communications among authorized users in real time.

Intranets as such are not a new idea. In fact, some of the most commonly used Internet applications-such as bulletin boards (BBSs) and commercial access services such as America OnLine (AOL)-are, in effect, large-scale intranets. That is, they link designated groups of users whose access to a given Internet site is determined by password or other user-recognition mechanisms. For example, each AOL subscriber has an individual account for which a password is established to control access. The password system enables users to pick and choose Internet features that interest them, to contract for services on an individual basis, and to engage in a number of Web-based transactions. On the other side of the equation, the system allows commercial service providers to track subscribers' usage and maintain account and billing information.

## **10.2 ADVANTAGES OF INTRANET**

The result of the implementation of an Intranet within an organization can be dramatic. Advantages of intranet include:

- A reduced learning curve in accessing information held in a variety of systems
- The abolishment of geographic and departmental compartmentalization. Users are only a phone call away – all they need is a computer system with a modem, ISP account and a phone line to access organization information.
- A dynamic space that enables local and global groups to collaborate and do business efficiently and effectively.
- Low deployment and maintenance costs. The intranet uses the existing architecture of the web.
- browser based (anyone can use)
- ease of publishing
- lower cost than traditional development alternative
- ease of use
- people friendly
- attractive with high pay back
- scalability
- easiness of developing

- easy software distribution
- based on standards
- easy to change
- easily customized
- good performance and
- well suited for most applications.

### **10.3 DISADVANTAGES OF INTRANET**

In spite of many advantages, the disadvantages of intranet also exists. These are as under:

- Collaborative applications for intranets are not as powerful compared to the ones offered by traditional groupware -Here it may be said that intranets do not have built- in data replication or directory services for remote users, where as groupware packages such as Lotus Notes do.
- Short term risk -There are limited tools for linking an intranet service to databases or other back-end mainframe-based applications. Programming standards for the web such as common gateway interface (CGI) and java, are fairly new and just maturing.
- Less backend integration -With intranets, firms have to set up and maintain separate applications such as e-mail and web servers, instead of using one unified system as with groupware.

The advantages as could be seen outweighs the disadvantages and hence useful for many types of applications.

### **10.4 INTRODUCTION TO SUPPLY CHAIN MANAGEMENT**

#### ***Background to Supply Chain Management***

Over recent years, the phenomenon of the supply chain has generated enormous interest. The roots of this preoccupation may be traced to the early 1980s and an increasingly

lack-lustre performance from many of the West's blue chip corporations. Suddenly the inefficiencies of the very corporations that had both spearheaded and epitomized post-war capitalist development were exposed: corporations such as Ford, General Motors and IBM were found seriously wanting as they were comprehensively out-manoeuvred by an emerging group of Asian rivals. The surrounding economic malaise across western Europe and North America was bad enough. However what was particularly alarming for corporations and governments alike was that the ground rules of industrial organisation appeared to be shifting. Specifically, the underlying premise that vertically integrated corporations constituted the elemental unit of dynamic and prosperous economies was shown to be erroneous. This fallacy had important implications. It is therefore important to understand its origin and arguably this may be traced to two largely misunderstood relationships.

### ***Changes in the Social Division of Labour***

The first concerns the link between the production system and the social division of labour which may be defined as the allocation of people to different firms or units of production. From the industrial revolution until the 1960s, there was an apparently inexorable growth in the size of lead firms. This trend was seen across many parameters: market share, levels of employment, physical assets, and so on. For this reason, lead firms were increasingly equated with the production system. In practical terms, this was largely correct. However it was conceptually flawed. Considerable importance was therefore focused on large firms.

### ***Changes in the Technical Division of Labour***

But herein lies the second misconception. Firms - whether large or small - are effectively only vessels for different elements of the technical division of labour and it is these, rather than firms, that define the production process; firms are merely organising units. A vertically integrated giant corporation that is apparently coincident with the production system - (A) in Figure 10.1 - actually encompasses a number of discrete tasks or units in the technical division of labour. The underlying fallacy was that these tasks would *necessarily* be completed within a single enterprise.

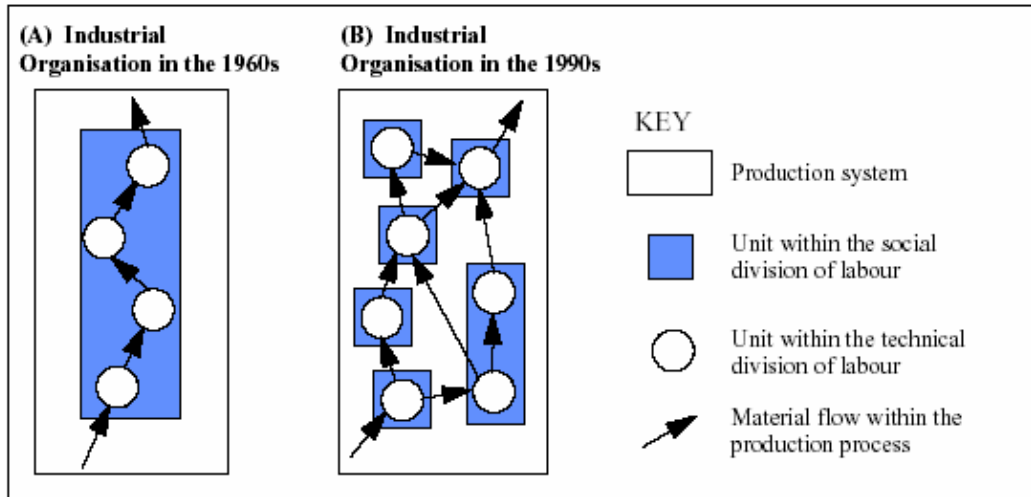


Figure 10.1: The Changing Premises of Industrial Organisation

In fact, tasks can potentially be distributed across the social division of labour in many different permutations; the vertically integrated giant corporation was just one of the myriad possibilities. Nevertheless, until the mid-1980s, it increasingly dominated every facet of the production process. While in one sense entirely arbitrary, the vertically integrated corporation provided a wholly appropriate vessel for production at a certain stage in the development of the technical division of labour; it did for example create the scope for substantial economies of scale. Such an arrangement was not however without its drawbacks. Specifically, sizeable costs surrounded the coordination of different tasks. These derived from many sources: inventories, unavoidable down time, the management of a diverse skills base, and so on. Particularly during the 1970s, the balance between the costs and benefits of production within the context of the giant corporation shifted. Increasing

### ***Complexity of Production Processes***

Underlying this transformation were important developments within the technical division of labour. Simply put, the number of identifiable tasks within many production processes increased exponentially. Products became ever more complex and, for the most part, they came to depend upon an increasing range of technologies and competencies. For instance, in constructing motor vehicles, there is now a requirement to draw heavily



upon the computer electronics industry and those with the wherewithal to design state-of-the-art air conditioning systems. Add to this the new disciplines of ergonomics, high level safety and digitalized sound, and the growing complexity of the production process surrounding the motor car becomes apparent. This rapid increase in the number of tasks is mirrored across the majority of product lines and it amounts to a significant elaboration of the technical division of labour. For the vertically integrated corporations however, this process created enormous challenges. Concomitantly, the fixed costs associated with integrated production processes have risen to prohibitive levels. For these reasons alone, the viability of the vertically integrated corporation was called into question.

### ***The Changing Nature of Demand***

However, to this must be added a further set of processes relating to the changing nature of demand. The vertically integrated corporation was manifestly ill-equipped to respond flexibly and efficiently to an emerging corpus of highly demanding consumers. With an elaborate technical division of labour, the costs of co-ordination were in any case high. Compounding this with a need for flexibility and responsiveness revealed further inherent weaknesses within this organisational form.

### ***The Emergence of Novel Organisational Forms***

For all of these reasons, by the early 1980s, many structural flaws within the fabric of the giant corporation were being exposed. In addition, the implicit rules underpinning the post-war economic order were both violated and overturned. And conceptually, the fallacy of conflating the production system - the technical division of labour and the social division of labour - was revealed. It is in this context that the full and radical implications of novel organisational forms must be understood. Suddenly loose groupings of - mostly Asian - firms comprehensively out-performed the corporations that had spearheaded the post-war economic revival. And the reason why Japanese 'Keiretsu' groupings and the like were able to achieve this feat lay less in their technologies or specific workforce skills than in the apparently mundane question of industrial organisation. In short, in the context of a far more elaborate technical division of labour, the Asian industrial groupings were able to succeed because the technical and social

divisions of labour were far more closely aligned and rather than co-ordination by the visible hand of management (with all the implications for inventories, down-time, etc.), there was scope for near-market forms of governance. Thus the production system was far closer to that of (B) in Figure 10.1. It could therefore draw upon an elaborate technical division of labour without the gross inefficiencies that would have surrounded full vertical integration. Moreover, because it was able to use effectively the full range of potential inputs, end products tended to be highly innovative. On the basis of both cost and new product development (NPD), the new production system therefore outperformed the established order.

### ***A New Focus on the Supply Chain***

The giant corporations have not however been slow to respond. Over the last decade, many have sought to down-size, to focus on their core competencies and then to out-source all other elements of the production process. In so doing they have reduced their overhead costs. They have also shed much of the risk surrounding NPD while retaining - if not enhancing - their ability to innovate. By drawing on specialist expertise from within the supply chain, the parameters for innovation have broadened considerably: the immense possibilities that surround hybrid technologies and processes have become clear. In addition, the duration of product development processes has been cut: lead firms and their supply chains have learned both to respond to and provoke rapid changes in market conditions.

### ***Radical Restructuring***

The restructuring that has occurred has been truly radical. Apart from anything else, it has compelled firms to engage proactively in both the creation and management of viable supply chains. This in itself has engendered a whole new set of challenges: it is wrong to assume either that suitable supply chain partners simply exist or that managing relationships so as to effect cost savings and innovation is straightforward. Supply chain relations may be managed in innumerable ways depending on the nature of the production process and the underlying competitive position: thus the form and nature of buyer-supplier relationships in the food industry differ substantially from those in

defence. Nevertheless the rationale for developing such an organisational matrix invariably reflects the developments in the technical division of labour described above. In terms of orchestrating supply chains, many developments have been premised on advances within the arena of information technology: the internet, electronic data interchange (EDI), ISDN networks, and so on have all facilitated the spatial and organisational separation of different elements of the production system. While it is important not to over-state the role of IT within the restructuring process, advances in this domain have certainly rendered novel organisational possibilities feasible.

***Definition of Supply chain management (SCM)***

It is the process of planning, implementing, and controlling the operations of the supply chain with the purpose to satisfy customer requirements as efficiently as possible. Supply chain management spans all movement and storage of raw materials, work-in-process inventory, and finished goods from point-of-origin to point-of-consumption.

Some experts distinguish supply chain management and logistics management, while others consider the terms to be interchangeable. From the point of view of an enterprise, the scope of supply chain management is usually bounded on the supply side by your supplier's suppliers and on the customer side by your customer's customers. Supply chain management is also a category of software products.

Supply chain management must address the following problems:

- **Distribution Network Configuration:** Number and location of suppliers, production facilities, distribution centers, warehouses and customers.
- **Distribution Strategy:** Centralized versus decentralized, direct shipment, cross docking, pull or push strategies, third party logistics.
- **Information:** Integrate systems and processes through the supply chain to share valuable information, including demand signals, forecasts, inventory and transportation.

- Inventory Management: Quantity and location of inventory including raw materials, work-in-process and finished goods.

### ***Supply Chain Management Business-To-Business (B2B)***

Few business fads have peaked and plummeted with the rapidity of Internet technology, in general, and B2B e-commerce and e-marketplaces, more specifically. Energized by the success of consumer auction sites and by savings from early e-procurement efforts, industry exchanges took off in mid-1998. By the end of the year 2000 more than 1,500 e-marketplaces had been announced. They ranged from independent, multi-industry exchanges to vertical consortia led by industry giants, and most were aimed at direct, strategic materials. Business plans for these e-marketplaces often consisted of nothing more than a press release, but the visions were grandiose. Then reality hit. As early as 1999, analysts began to warn that even the largest industries could support only a handful of e-marketplaces. It increasingly became clear that the path to value would be measured in years, not months. Helped along by the bursting of the Internet bubble and a suspicion of all things B2B, the creation of e-marketplaces slowed. Announcements of failures and consolidations replaced notices of new launches. However, research firms that closely watch this sector are far from writing off e-marketplaces or the B2B revolution. There is one significant change in the new projections—today, analysts are saying that much of this business, perhaps as much as 85%, will not go through public marketplaces but instead will be conducted over private marketplaces that cross a wide range of applications. Many say that there is little difference between the basic technology employed in public and private marketplaces. The only real distinction appears to be the model of participation. That model is one reason that private marketplaces offer a faster path to value. One-to-many (1:M) networks are easier to make work than the many-to-many (M:M) model of consortia exchanges that are predicted to offer no more than auction, spot-buy, and excess inventory services for at least the next two years. The real power of the private exchanges lies in streamlining existing relationships, including those with resellers, distributors, and logistics providers.

### ***The Changing Face of Business***

Following the traditional approach, no matter how good the product, the first step is to get the supply chain in order. Next, a business must hire a seasoned purchasing manager to aggressively deal with material and service providers so that costs can be brought in line. Then the enterprise must find dynamic sales and marketing personnel to drive finished product into the hands of the consumer. Tweak the system every now and then and watch while product flows out and profits flow in. That is basically how things have worked in the past; businesses maintain heavily push-driven, sequential supply chains, based on fundamentally adversarial relationships with their suppliers. Success hinges on out manoeuvring, outperforming, and outwitting everyone perceived as competition. Although this may be the traditional approach, it's not the only way. A lot of forward-thinking companies are beginning to look at an approach that defies convention. The new approach involves making allies of suppliers and customers alike, embracing them in value nets instead of coercing them into precarious supply chains. Many consider this the next evolution in the supply chain. This emerging value net business model starts from the premise that a better product is no longer your ticket to success, but merely your entry fee into the game. In fact, if a business puts a better product at the centre of its efforts, this strategy demonstrates that the company has missed the point of the value net approach altogether. The idea is to put customer priorities at the centre and design the value net around them. Moreover, it is important to recognize that customer priorities stem not from some amorphous group called the customers, but from individuals that have unique needs and wants. Where the traditional supply chain would push out a fixed line of one-size-fits-all items, hoping that customers would buy them, the value net in contrast allows unique customers to choose product or service attributes that they value the most; in effect, to design their own product. Then the value net configures itself, its suppliers, its manufacturing services, and its delivery capabilities to meet the needs of each customer or at least of each customer segment. It differentiates itself to supply one-size-fits one or customized products for each customer or customer grouping. It leverages operations and customer choice to drive strategic advantage.

## **10.5 FEATURES OF SUPPLY CHAIN MANAGEMENT**

In electronic commerce, supply chain management has the following features::

- An ability to source raw material or finished goods from anywhere in the world
- A centralized, global business and management strategy with flawless local execution
- On-line, real-time distributed information processing to the desktop, providing total supply chain information visibility
- The ability to manage information not only within a company but across industries and enterprises
- The seamless integration of all supply chain processes and measurements, including third-party suppliers, information systems, cost accounting standards, and measurement systems
- The development and implementation of accounting models such as activity based costing that link cost to performance are used as tools for cost reduction
- A reconfiguration of the supply chain organization into high-performance teams going from the shop floor to senior management.

## **10.6 COMPONENTS OF SUPPLY CHAIN MANAGEMENT**

Supply chain management (SCM) is the combination of art and science that goes into improving the way your company finds the raw components it needs to make a product or service and deliver it to customers. The following are five basic components of SCM:

- **Plan** – This is the strategic portion of SCM. You need a strategy for managing all the resources that go toward meeting customer demand for your product or service. A big piece of planning is developing a set of metrics to monitor the supply chain so that it is efficient, costs less and delivers high quality and value to customers.
- **Source** – Choose the suppliers that will deliver the goods and services you need to create your product. Develop a set of pricing, delivery and payment processes with suppliers and create metrics for monitoring and improving the relationships. And put together processes for managing the inventory of goods and services you receive from suppliers, including receiving shipments, verifying them,

transferring them to your manufacturing facilities and authorizing supplier payments.

- Make – This is the manufacturing step. Schedule the activities necessary for production, testing, packaging and preparation for delivery. As the most metric-intensive portion of the supply chain, measure quality levels, production output and worker productivity.
- Deliver – This is the part that many insiders refer to as logistics. Coordinate the receipt of orders from customers, develop a network of warehouses, pick carriers to get products to customers and set up an invoicing system to receive payments.
- Return – The problem part of the supply chain. Create a network for receiving defective and excess products back from customers and supporting customers who have problems with delivered products.

## **10.7 BULLWHIP EFFECT AND SUPPLY CHAIN MANAGEMENT**

The objective of supply chain management is to provide a high velocity flow of high quality, relevant information that will enable suppliers to provide an uninterrupted and precisely timed flow of materials to customers. However, unplanned demand oscillations, including those caused by stockouts, in the supply chain execution process create distortions which can wreck havoc up and down the supply chain. There are numerous causes, often in combination that will cause these supply chain distortions to start what has become known as the “Bullwhip Effect”. While the devil is usually buried in the details, as is the case here, the most common general drivers of these demand distortions are:

- Customers
- Sales
- Policies
- Systems
- Promotions
- Manufacturing
- Processes
- Suppliers

This unplanned for demand results in a disturbance or “lump of demand”, which may be a minor blip for any one customer, oscillates back through the supply chain often resulting in huge and costly disturbances at the supplier end of the chain. Often, these demand oscillations will launch a “mad scramble” in manufacturing with the need to acquire and expedite more raw materials and reschedule production. The “Bullwhip Effect” has in the past been accepted as normal, and in fact, thought to be an inevitable part of the order-to-delivery cycle. Yet, the negative effect on business performance is often found in excess inventories, quality problems, higher raw material costs, overtime expenses and shipping costs. In the worst-case scenario, customer service goes down, lead times lengthen, sales are lost, costs go up and capacity is adjusted. An important element to operating a smooth flowing supply chain is to mitigate and preferably eliminate the “Bullwhip Effect”.

**Understand The Causes** It is important for management to understand the causal factors that create supply chain oscillations. Here are some examples:

- *How does sporadic sales promotions impact demand patterns, cost and margins?* Many companies that conduct sales promotions that effect current inventory and the supply pipeline do not understand the impact, on a quantitative and qualitative basis, of what their sales promotion policies and practices actually do. After gaining a complete and accurate understanding of what sales promotions do for you vs. what sales promotions do to you, most companies are left with the need to answer the question, “What sales promotion policies and practices should we change?” A *common* complaint from the manufacturing side of the business, and a common reason for severe demand distortions that cause supply chain oscillations, are un-forecasted and “unknown” sales promotions. These unplanned for sales promotion events ripple throughout the supply chain creating excess costs which border on the incalculable.



- *Does your sales incentive plan contribute to demand distortions?* Sales targets, quotas and commission accelerators when applied to an extended quota period, such as three months, will often cause demand distortion. Management needs to examine the rationale for sales incentives to be based on shorter-intervals rather than three months or longer. Typically, shorter measurement periods promote a smoothing of demand resulting in decreased ordering lumps resulting in a dampening of the “Bullwhip Effect”.
  
- *Are you the victim of false orders and subsequent cancellations?* Two common causes for false orders are:
  1. The customer does not have confidence in your ability to rapidly and reliably supply product. In other words, your customers do not believe you will ship their orders on-time. As a result, customers will hedge by placing higher than projected demand on the manufacturer in the hope they will receive what they need, when they need it and then, when product availability is considered satisfactory, cancel the balance of future orders. These “false” orders often result in excess purchased material in inventory and in the pipeline as well as underutilized capacity.
  2. Sales personnel who will not meet their quota for a time period that would accelerate commissions and qualify them for a bonus, will often have added or change orders placed by a cooperative customer to achieve quota. The customer in turn may later cancel, or return, part or all of the order, as well as expect some concessions and/or special treatment from the salesperson in the future for providing the “service”.
  
- *Do transportation incentives cause demand lumps?* Transportation discount incentives for volume orders will often cause customers to accumulate orders and then release lumps of demand. After thoroughly examining the impact that this incented distortion has on hampering your own supply chain planning

capabilities, and the resultant associated costs, it may be time to examine your freight incentive practices.

- *Have you developed partnerships based on trust with your customers?* With distributors often leery of a manufacturer's ultimate intentions, especially with the possibility the distributor will be removed from the sales chain, and, the manufacturer selling directly to end-users, there is no desire to frequently share customer volumes, demand patterns and inventory positions. On the other hand, this mistrust contributes to demand oscillations, stockouts, higher inventories and lost sales for the manufacturer and distributor. Developing a workable and effective solution is essential. For whatever individual or combination of causes that create demand surges and oscillations, these lumps of demand explode out through your supplier network and their supplier network often extending lead-times due to unexpected, and often false, increases in demand. Then, the supplier network may not be able to get raw material in a short enough lead time which reverses in the supply chain as it causes theirs and your delivery lead time to lengthen. Then, the product manufacturer tells their distributors who tell their dealers that lead-times have increased due to supply problems.
- The "Bullwhip Effect" is now traveling the other way - down the supply chain. And, it may get worse with another "Bullwhip Effect" going up the chain again as longer lead times cause customer's replenishment planning systems to "kick-out" new, and very often, false demand for future supply coverage. This new surge in demand often causes decisions to be made that will increase capacity unnecessarily as the demand ultimately dissipates. As unnecessary demand variability complicates the supply chain planning and execution processes the following undesirable effects increase in their severity as they negatively impact operating performance.
  - Schedule variability increases
  - Capacity is overloaded and/or under-loaded

- Cycle times lengthen
- Working and safety stock inventories increase
- Overall costs increase
- Customer service levels decrease
- Sales and profits decrease

### ***Overcoming the “Bullwhip Effect”***

Essential to minimizing the “Bullwhip Effect” is to first, specifically understand what drives customer demand planning and inventory consumption as they are the triggers for replenishment order quantities at various points in the supply chain. The most effective process for smoothing out the oscillations of the “Bullwhip Effect” will be customers and suppliers understanding what drives demand and supply patterns and then, collaboratively working to improve information quality and compressing cycle times throughout the entire process. More than likely, you will find opportunities for improvement by adopting some or all of the following actions, among others, to minimize the “Bullwhip Effect” and increase business performance.

- Minimize the cycle time in receiving projected and actual demand information.
- Establish the monitoring of actual demand for product to as near a real time basis as possible.
- Understand product demand patterns at each stage of the supply chain.
- Increase the frequency and quality of collaboration through shared demand information.
- Minimize or eliminate information queues that create information flow delays.
- Eliminate inventory replenishment methods that launch demand lumps into the supply chain.
- Eliminate incentives for customers that directly cause demand accumulation and order staging prior to a replenishment request, such as volume transportation discounts.
- Minimize incentives promotions that will cause customers to delay orders and thereby interrupt smoother ordering patterns.

- Offer your products at consistently good prices to minimize buying surges brought on by temporary promotional discounts.
- Identify, and preferably, eliminate the cause of customer order reductions or cancellations.
- Provide vendor-managed inventory (VMI) services by collaboratively planning inventory needs with the customer to projected end-user demand then, monitor actual demand to fine tune the actual VMI levels. (Note: VMI can increase sales and profits especially in industries where buyers can go to alternative sources if you or your distributor stock-out.)

Even the most modern of Supply Chain Management systems, with all the bells and whistles, cannot automatically stop the “Bullwhip Effect”. It’s a demand management process problem with very broad implications because it often encompasses policies, measurements systems, practices and, in some cases, the very core of an organization’s value and belief system. However, the degree of negative effect it can have on sales, market share, cost and profits can be enormous. Certainly, a tough but very necessary problem to solve.

## **10.8 MANAGING SUPPLY CHAIN**

### ***Traditional Supply Chain***

The traditional supply chain often includes more than one company in a series of supplier-customer relationships. It is often defined as the series of links and shared processes that involve all activities from the acquisition of raw materials to the delivery of finished goods to the end consumer. Raw materials enter into a manufacturing organization via a supply system and are transformed into finished goods. The finished goods are then supplied to customers through a distribution system. Generally several companies are linked together in this process, each adding value to the product as it moves through the supply chain. Effective supply chain management is the act of optimizing all activities throughout the supply chain, and it is the key to a competitive business advantage. Consequently, an organization’s ability to gain a competitive advantage is heavily dependent on coordination and collaboration with its supply chain

partners. Yet, even today, a typical supply chain is too often a sequence of disconnected activities, both within and outside of the organization. To remedy this situation, it is important that an organization and its suppliers, manufacturers, customers, and other third-party providers engage in joint strategic planning and operational execution with an eye to minimizing cost and maximizing value across the entire supply chain.

### ***Exchanging Data is Critical***

The underlying enabler of supply chain integration is the fast and timely exchange of information between supply chain partners. This information may take the form of transactional documents such as purchase orders, ship notices, and invoices, as well as planning-related documents like demand forecasts, production plans and inventory reports. It is this sharing and coordination of information and planning activities that can enable cost reduction, value enhancement, and the execution of advanced collaborative planning activities. In the past, the cost and complexity of executing electronic data interchange (EDI) transactions made this type of information exchange suitable for only the largest corporations. The ubiquity of Internet-based communication tools now makes it possible for organizations of all sizes to exchange information. However, challenges still exist and being able to successfully deal with all the new technologies is one of these challenges. The good news is that this data exchange challenge can be overcome; and the opportunities become endless once companies are able to exchange information efficiently with their suppliers, customers, and partners. Applications like vendor-managed inventory (VMI), collaborative planning, e-procurement, shipment tracking and tracing, electronic order management, and bill presentment and payment can be built upon a core data exchange platform, enabling companies to reap true cost reduction and service improvement within their organization.

A supply-chain encompasses all activities and information flows necessary for the transformation of goods from the origin of the raw material to when the product is finally consumed or discarded. This typically involves distribution of product from the supplier to the manufacturer to the wholesaler to the retailer and to the final consumer, otherwise known as nodes in the supply-chain. The transformation of product from node to node

includes activities such as production planning, purchasing, materials management, distribution, customer service and forecasting.

While each firm can be competitive through improvements to its internal practices, ultimately the ability to do business effectively depends on the efficient functioning of the entire supply-chain. For example, a wholesaler's inability to adequately maintain inventory control or respond to sudden changes in demand for stock may mean that a retailer cannot meet final consumer demand. Conversely, poor sales data from retailers may result in inadequate forecasting of manufacturing requirements.

However, it is not simply about passing information from one node in the supply-chain to the next. The dispatch and distribution functions need to work effectively as well, so movement of product from one node to another happens in a timely manner and meets production scheduling.

All that said, there can be little point trying to improve your bottom line through transforming your own business without similar changes to the way your supply chain as a whole is functioning. That is, there needs to be consistency between individual business objectives and the objectives of the supply-chain, and access to information in order to provide visibility of data flows.

### ***Collaboration***

Technology solutions can support greater data visibility and integration of dispatch and distribution with production scheduling. However, one element that underpins management of the supply-chain is collaboration.

Collaboration means firms share information in an accurate and timely manner so all businesses in the supply-chain can adequately plan forward inputs and outputs, dispatch product, manage risk and maximize return on investment. This improves the overall functioning of the supply-chain and ultimately the individual firm's bottom line. The key

to collaboration is communication and the key to better communication is electronic transfer of information.

## **10.9 E-MARKETPLACE**

Several financial institutions and telecommunication companies recently joined forces to create one of Canada's largest B2B electronic marketplaces. The proposed company will offer business products, equipment and furniture, computer hardware and accessories. They will also offer business services such as travel, personnel, promotional items, and courier services in a quick and efficient manner at a reduced cost. The newly formed company will produce value by combining procurement expertise and significant purchasing volume with the advantages of the e-market place. This will allow participants to save time and money and stay focused on their strategic priorities and core competencies. The exchange will also create opportunities for suppliers to increase sales by enabling new relationships between buyer and sellers.

### ***E-Marketplaces' Business Model Needs Change***

Many industry experts predict that the majority of these B2B e-marketplaces will not survive the "dot-com shakeout." A major stumbling block stems from manufacturers that were connected with suppliers through systems that created duplicate, rather than complementary, distribution channels. Whether for coalitions of brick-and mortar companies or independent Net markets, this method fostered a lack of collaboration among customers and channel partners. This lack of collaboration resulted in companies having to manually input transactional data. The benefits of participating in public e-marketplaces require precise systems integration. Buyers, meanwhile, grappled with the lack of connectivity to their back-end systems. Sure it was great to be able to search multiple suppliers for the lowest prices on goods and services, but when it came time to close the deal, buyers, more frequently than not, used the phone and/or fax to avoid paying e-market transaction fees. This points to the flaw in the public e-marketplaces' business model...most public marketplaces were not able to move beyond the transaction simply because transaction fees formed the core of their revenue streams.

### *The Rise of the Private E-Marketplace*

Businesses are beginning to move to a more commonsense approach to using online marketplaces. Suppliers are beginning to ask several questions that read like a checklist for manufacturers:

- How can I make it easier for my customers to do business with me?
- How can I take care of my existing channel partners?
- How do I ensure my return on investment (ROI) for my technology investment?
- How do I increase my market capitalization over the long term?

The answers to these questions lead to just one logical outcome the rise and eventual domination of private e-marketplaces. Private e-marketplaces (whether consortium-based or centred around a single, large supplier) will dominate in the future because they have the capacity to co-op existing channel partners (distributors, retailers, service centres, sales representatives) rather than exclude them. Buyers will benefit from this because they will receive greatly improved service before and after the sale, while realizing the kinds of transactional efficiencies the public marketplace promised. Ultimately, private e-marketplaces will dominate because they provide greater control over branding, marketing, and transaction data that ensures long-term customer satisfaction. This is not to say that public marketplaces will disappear. The public e-marketplaces will become merely another sales channel for the suppliers, instead of the one and only distribution channel.

### **10.10 INTERNET AND SUPPLY CHAIN MANAGEMENT**

Now that the hype is over, it is time to look at what the Internet does or makes capable from a practical point of view. In a nutshell, the Internet is a unique medium that allows fast, two-way, secure communication. What makes the Internet different from electronic data interchange (EDI), a technology that has been around for more than 20 years? Essentially, the Internet performs the same function as EDI at a fraction of the cost. Moreover, it has capabilities that EDI does not possess, namely, real-time versus batch processing, transmission of unlimited data types including graphics, forecasts and



computer-aided design (CAD) drawings, and an open, non-proprietary network. If carefully exploited, these Internet characteristics can lead to significant value creation. To identify potential sources of value from B2B e-commerce, a good starting point is to think of the number of ways in which your company interacts with both customers and suppliers. These interactions can be categorized as one of the following: executing a transaction; determining optimal prices; discovering available supply and unmet demand; and supply chain planning for new and existing products. Thus, three distinct categories emerge where B2B e-commerce can be applied to extract value:

- Reduced transaction charges
- Improved market efficiencies
- Enhanced supply chain benefits

Prior to making any investment in B2B e-commerce, a company has to identify the value created and the effort required for implementation under each of these categories. The relative position of these categories will not be the same for all firms but will vary based on the supply chain strategy and competitive environment. A company must tailor e-commerce implementation to support categories where the value created is high relative to the cost of implementation. Transaction charges are those costs incurred during the process of completing a transaction. This includes the cost associated with handling proposals and quotations, processing orders, staffing the procurement function, operating the call centre, and so on. Traditional channels of communication such as phone and fax require high staffing levels on both the buyer's and the seller's side. They also typically have high error rates because of multiple data entries. As companies move towards electronic processes, error rates decline, fewer staff are needed to process orders, and order placement speeds up, leading to lower overall transaction costs. Companies using EDI already have achieved many of the benefits in this category. Given the high set-up cost and proprietary nature of EDI, however, they have only established links with their largest suppliers and or customers. The Internet with its open access and lower cost of participation allows all participants the opportunity to reduce transaction charges. In addition, the Internet allows real-time processing and electronic data retrieval and

storage, which are essential components to reduce order cycle time. Market efficiencies offer two avenues for a company to extract value:

- the price paid when soliciting bids from suppliers, and
- the ability to match surplus capacity in its supply chain with unmet demand.

The Internet offers an opportunity in both instances. The Internet facilitates the aggregation of orders across all divisions of a company and makes it easier to bring in more potential suppliers for the bidding process. This translates into a better price for the buyer because of increased volumes and greater competition. B2B e-commerce also provides a mechanism by which a company can move its demand across suppliers based on available capacity. In the past, suppliers may have had idle capacity while original equipment manufacturers (OEMs), with unfilled demand, were searching elsewhere. A better matching of available capacity and demand provides value by improving the utilization of available capacity. Supply chain activities include the flow of information, materials and finances between different stages of a supply chain from suppliers to customers. When different stages of the supply chain plan locally without sharing information, the result is the “bullwhip effect”, whereby small fluctuations in consumer demand lead to large fluctuations at the manufacturer and supplier. In some supply chains, orders to suppliers can fluctuate 10 to 20 times more than orders placed by the ultimate customer. The increased variability leads to long supply lead times, excess capacity, high transportation and warehousing costs, large inventories and dissatisfied customers. B2B e-commerce can create value in a supply chain at two levels. First, by increasing visibility across the supply chain, the Internet can help dampen the “bullwhip effect”. The resulting decrease in variability allows a supply chain to improve customer service while reducing costs. Second, the Internet can provide value from increased collaboration. Collaboration is the ability of different stages of the supply chain to make decisions on product design and introduction, pricing, production and distribution that will allow all partners to participate. For example, a major North American retailer and one of their key manufacturers increase visibility when the retailer shares point-of-sale data. However, the partners only realize full value when they use this information, along

with capacity information at the manufacturer's facilities to decide the best timing for promotions and resulting production plans. If decisions are made independently, the retailer may run the promotion at a time when production costs for the manufacturer are the highest. Through collaboration, constraints on both sides are considered in determining a schedule that maximizes profits. The Internet also facilitates collaborative product design. This is a key capability planned for the automotive industry exchange operated by major carmakers. Currently, CAD drawings of product components are designed by engineers in one country, distributed by courier to engineers in another country, and then finalized at a joint meeting in a country somewhere in between! B2B e-commerce promises a "virtual product workplace" where engineers can collaborate with suppliers and customers in real-time from their desks, saving cost while speeding up product development cycles and time to market.

#### **10.11 MEASURING A SUPPLY CHAIN'S PERFORMANCE**

The performance of a supply chain is evaluated by how it reduces cost or increases value. SCM performance monitoring is important; in many industries, the supply chain represents roughly 75 percent of the operating budget expense. Three common measures of performance are used when evaluating SCM performance:

- Efficiency focuses on minimizing cost by decreasing the inventory investment or value relative to the cost of goods sold. An efficient firm is therefore one with a higher inventory turnover or fewer weeks' worth of inventory on hand.
- Responsiveness focuses on reduction in both inventory costs and missed sales that comes with a faster, more flexible supply chain. A responsive firm is proficient in an uncertain market environment, because it can quickly adjust production to meet demand.
- Effectiveness of the supply chain relates to the degree to which the supply chain creates value for the customer. Effectiveness-focused supply chains are called "value chains" because they focus more on creating customer value than reducing costs and improving productivity.

To examine the effect of the Internet and electronic commerce on the supply chain is to examine the impact the Internet has on the efficiency, responsiveness, effectiveness, and overall performance of the supply chain.

### **10.12 Advantages of Internet/e-commerce integrated supply chain**

The primary advantages of Internet utilization in supply chain management are speed, decreased cost, flexibility, and the potential to shorten the supply chain.

- **Speed:** A competitive advantage accrues to those firms that can quickly respond to changing market conditions. Because the Internet allows near instantaneous transfer of information between various links in the supply chain, it is ideally suited to help firms keep pace with their environments. Many businesses have placed a priority upon real-time information regarding the status of orders and production from other members of the supply chain.
- **Cost decrease:** Internet-based electronic procurement helps reduce costs by decreasing the use of paper and labor, reducing errors, providing better tracking of purchase orders and goods delivery, streamlining ordering processes, and cutting acquisition cycle times.
- **Flexibility:** The Internet allows for custom interfaces between a company and its different clients, helping to cost-effectively establish mass customization. A manufacturer can easily create a custom template or Web site for a fellow supply chain member with pre-negotiated prices for various products listed on the site, making re-ordering only a mouse click away. The information regarding this transaction can be sent via the Internet to the selling firm's production floor and the purchasing firm's purchasing and accounting departments. The accuracy and reliability of the information is greater than the traditional paper and pencil transaction, personnel time and expense is reduced, and the real-time dissemination of the relevant information to interested parties improves

responsiveness. These advantages can benefit both firms involved in the transaction.

- **Shortening the supply chain:** Dell computers has become a classic example of the power the Internet can have on a supply chain. Dell helped create one of the first fully Internet-enabled supply chains and revolutionized the personal-computer industry by selling directly to businesses and consumers, rather than through retailers and middlemen. In mid-1996, Dell began allowing consumers to configure and order computers online. By 1998, the company recorded roughly \$1 billion in “pure” Internet orders. By reducing sales costs and attracting customers who spend more per transaction, Dell estimates that it yields 30 percent greater profit margins on Internet sales compared to telephone sales.

### **10.13 DISADVANTAGES OF INTERNET/E-COMMERCE INTEGRATED SUPPLY CHAIN**

Negative features of an Internet-integrated supply chain include increased interdependence, the costs of implementation, and keeping up with the change in expectations.

- **Increased interdependence:** It is true that the Internet facilitates various levels of integration that help members of the supply chain to create improved partnerships, coordinate their operations more closely, and reduce inefficiencies; however doing so requires an enormous amount of trust and information sharing. To stay competitive, many companies find that they must share information electronically that they once considered proprietary. Increased commoditization, increased competition, and shrinking profit margins are forcing companies to increase outsourcing and subcontracting to minimize cost. By focusing on its core competencies, a firm should be able to maximize its economies of scale and its competitiveness. However, such a strategy requires increased reliance and information sharing between members of the supply chain. Increased dependency

on various members of the supply chain can have disastrous consequences if these supply chain members are unable to handle the functions assigned to them.

- **The costs of implementation:** Implementation of a fully-integrated Internet-based supply chain is expensive. This expense includes hardware cost, software cost, reorganization cost, and training costs. While the Internet promises many advantages once it is fully integrated into a supply chain, a significant up front investment is needed for full deployment.
- **Keeping up with the change in expectations:** Expectations have increased as Internet use has become part of daily life. When customers send orders electronically, they expect to get a quick confirmation and delivery or denial if the order can not be met. Increasingly, in this and other ways, customers are dictating terms and conditions to suppliers. The introduction of Internet-based supply chains make possible the change to a “pull” manufacturing strategy replacing the traditional “push” strategy that has been the standard in most industries.

#### **10.14 ERP AND SUPPLY CHAIN MANAGEMENT**

Many SCM applications are reliant upon the kind of information that is stored in the most quantity inside ERP software. Theoretically you could assemble the information you need to feed the SCM applications from legacy systems (for most companies this means Excel spreadsheets spread out all over the place), but it can be nightmarish to try to get that information flowing on a fast, reliable basis from all the areas of the company. ERP is the battering ram that integrates all that information together in a single application, and SCM applications benefit from having a single major source to go to for up-to-date information. Most CIOs who have tried to install SCM applications say they are glad they did ERP first. They call the ERP projects “putting your information house in order.” Of course, ERP is expensive and difficult, so you may want to explore ways to feed your SCM applications the information they need without doing ERP first. These days, most ERP vendors have SCM modules so doing an ERP project may be a way to kill two birds

with one stone. Companies will need to decide if these products meet their needs or if they need a more specialized system.

Applications that simply automate the logistics aspects of SCM are less dependent upon gathering information from around the company, so they tend to be independent of the ERP decision. But chances are, you'll need to have these applications communicate with ERP in some fashion. It's important to pay attention to the software's ability to integrate with the Internet and with ERP applications because the Internet will drive demand for integrated information. For example, if any body want to build a private website for communicating with his customers and suppliers, he will want to pull information from ERP and supply chain applications together to present updated information about orders, payments, manufacturing status and delivery.

#### **10.15 SUMMARY**

The Internet provides a tool that allows supply chain activities to be carried out in a synchronized, instantaneous manner, facilitating maximum supply chain performance. The positive benefits of integrating the Internet into management of the supply chain generally outweigh the risks and associated costs, and firms who have completed such integration hold a current competitive advantage over those that have not. Internet deployment is not a means to an end in and of itself, but is rather a supply chain management tool that can be used to improve customer satisfaction, reduce costs, smooth production flows and shorten cycle times.

Business-to-business exchanges are developing in nearly all industries and take the form either of seller-centric, Web-centric or true exchanges in which many sellers have access to many buyers. The narrow view of using the Internet for SCM is that of integrating a customer and several vendors in full communication of formerly confidential information. In this form, vendors have access to customers' needs based on the customer's current state of business that includes production capabilities (i.e. the rate at which the customer will use the material it already has in inventory), orders pending, forecast sales for the immediate and short-term future, and even forecasts for the long-term so that vendors also can better plan their own needs.

This is difficult for businesses to share with outsiders; should competitors become aware of such proprietary information the results could be devastating. Organizations striving to achieve optimum SCM through the use of the Internet necessarily will need to have absolute confidence in their suppliers and others involved in the supply chain. However, this is not far from the level of trust required to operate under a JIT system. Any manufacturer depending on its vendors to ship when existing inventories reach a predetermined level have already entrusted those vendors with significant responsibility for its success. Using the Internet for the same purpose does not represent a major paradigm shift in belief systems, only the ability to operate the same systems within a different setting.

#### **10.16 KEYWORDS**

**INTRANET:** Network within organization

**SCM:** Supply Chain Management

**BULLWHIP EFFECT:** Unplanned demand oscillations, including those caused by stockouts, in the supply chain execution process create distortions which can wreak havoc up and down the supply chain is known as Bullwhip effect

**VMI:** vendor-managed inventory

**EDI:** Electronic Data Interchange, a method of structured data interchange between two trading partners

#### **10.17 SELF ASSESSMENT QUESTION**

1. What is supply chain management? Discuss various characteristics of SCM.
2. What is a supply chain?
3. Define the role of Internet in Supply Chain Management.
4. Explain various advantages and disadvantages of internet based SCM.
5. How intranet is different from internet?
6. What is an Intranet? Explain its various features.
7. What do you mean by Bullwhip Effect? How it can be minimized by using SCM?



## **10.18 SUGGESTED READINGS**

- Kalakota, Ravi and Whinston, Andrew B. “Electronic Commerce – A Manager’s Guide”, Pearson Education, Inc.
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# **LESSON: 11**

## **INTRANETS AND CUSTOMER ASSET MANAGEMENT**

**Subject: E-Commerce**

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### **STRUCTURE**

- 11.0 Objectives
- 11.1 Introduction to Customer Asset Management
- 11.2 Basics of Customer Asset Management
- 11.3 Online Sales Force
- 11.4 Online Customer Service and Support
- 11.5 Technology and Marketing Strategy
- 11.6 Summary
- 11.7 Keywords
- 11.8 Self Assessment Questions
- 11.9 Suggested Readings

### **11.0 OBJECTIVES**

The motive of this chapter is to present an introduction to intranet and customer asset management and within that framework the key basic concepts, implementation challenges, sales force automation issues, its benefits for the business organizations, customer service support and services, and marketing strategies using technology in the customer asset management are discussed.

After going through this lesson, you will be able to:

- Describe the concept of customer asset management.
- Explain the reasons for understanding the concept of customer asset management.

- Describe the role of online sales force in enhancing the sales productivity.
- Discuss the management issues related to customer asset management.
- Describe marketing strategies related to technology.

## **11.1 INTRODUCTION TO CUSTOMER ASSET MANAGEMENT**

Organizations in usual supply chain management systems mainly focus on the basic operations and do not take care of customer demand which is an important element for 'pull' supply chains as it leads to customer satisfaction. Customer satisfaction can be achieved through effectively integrating the information related to marketing, sales and customer service activities with the functions like manufacturing and distribution, and by replacing the traditional system with new technology based approaches. Customer satisfaction is as important as marketing itself. However, the use of technology can be a strategic issue for any organization to manage its customers by adding value to every customer interaction. This customer interaction strategy finally takes the form of customer asset management.

Kalakota and Whinston define Customer Asset Management as “the integration of the front-line activities in a supply chain namely sales, market intelligence gathering and customer service to act in a coordinated manner rather than pulling in different directions.” It is based on the premise that customers are the most valuable asset of any business and each interaction with the customer should be viewed critically and must add value.

Customer Asset Management helps organizations to be with the customers throughout their life cycle from initial marketing to customer service. It is in an economically prudent manner to drive sustainable, long-term and profitable customer relationship. It is a system of marketing and selling that is driven out of a proactive, plan full and personal approach to manage mutually beneficial individual customer relationship.

The intranet for Customer Asset Management provides a range of platform independent services and facilities tailored to the varying needs of Customers, company managers and

others within a secure online web-based environment. The intranet serves a potential user base of millions of individuals, local authorities and a wide range of associated interests. An organization can create, within its virtual boundaries, a manageable, secure version of the World Wide Web, which can be used to provide its users with access to a specified range of applications and services. Certain agreed elements of an intranet can also be made available as appropriate to specific outside interests in the form of extranet facilities.

## **11.2 BASICS OF CUSTOMER ASSET MANAGEMENT**

Facing the day-by-day technological changes, many companies seeking to increase revenue, market share and competitive advantage are employing the new strategy called customer asset management. Customer asset management highlights the importance of customers and defines them as the most valuable asset of any business. In this competitive environment, the trends of attracting and keeping customers are changing and customer information systems are built or created as '*islands of information*' with an integrated software application where technology is used in a strategic manner for customers.

The prime objective of business organizations is to use required technology to add value to customers' interaction, customer service and produce revenue growth. Companies are emphasizing and embracing customer asset management as a Revenue growth strategy for maximizing the value of customer relationships and satisfaction.

Following are the four major components of customer asset management:

1. **Online Sales Force Automation:** to integrate sales activity in to a corporate information structure and to improve overall organization efficiency and coordinate with other business activities.
2. **Market Intelligence:** related to trend analysis, channel management, relationship management, supply chain management and competitor intelligence.

3. **Online Customer Service and Support:** Online customer support services are increasingly becoming an area for competitive advantage. The customer is most concerned about an interruption in the service that they expect from the product and their worries can be specified into following areas: *reliability, service dependability, and maintenance*. In order to provide the most effective online support, a supplier must identify the services that customers value most and their relative importance.
  
4. **Marketing Management:** marketing planning, providing reports on sales activities, sales forecasting, deviation between forecasts versus actual, designing and managing sales channel, sales territories and analyzing the marketing programs.

Customer asset management is to satisfy real customer needs. Value for the customer is built on an in-depth understanding of customer's needs, which leads to the personalized delivery of value and the building of customer loyalty. Customer asset management duties include acting as a single point of contact, developing customer relationships, understanding customer's decision making, identifying business opportunities, providing competitive intelligence, negotiating sales, and orchestrating customer service.

### **Why Customer Asset Management?**

The benefits of Customer Asset Management system are:

- To create more loyal customers
- Retention of profitable customers
- Highly efficient and more focused communication programs for customers
- Customer focused development of products and services

However, with the introduction of customer asset management system in an organization, many of the managers may face a little bit anxiety and frustration. This system can be

made effective by understanding the following conditions strategically that only a few organizations meet.

1. Future sales can be predicted through current customers.
2. The sales potential can be estimated for future by segmenting the customers based on sales history and can be more effective than segmenting on the basis of demographic factors. Creating databases by capturing customers' transaction history can help in realizing future trends.
3. Customers are subject to depreciate like other assets. Customer may be dissatisfied with the service, find a better price elsewhere or feel arduous of existing services. This is known as attrition and is often predictable with the knowledge of transaction history.
4. Customers can be bought and sold. For example, the merger and acquisition decision of organizations can represent the combination of customer bases whose sales potential is to be realized with smaller and more efficient infrastructure.

### **Customer Asset Management - Implementation Challenges**

In implementing the customer asset management system, companies are facing the following major challenges:

1. To capture the customers' information in dynamic environment is very difficult and expensive to gather.
2. Many difficulties like coordination across various customer-facing functions.
3. The customers' needs and expectations are changing all the time.

Collecting information relevant to customers for making customer asset management as asset base may be difficult and costly. This problem can be overcome by using the web, intranet and other online services by purchasing better hardware and developing sophisticated marketing oriented software that can help in building sound customer databases to share information for mutual benefit and to facilitate the customer online and instant information system and providing attractive incentives for customers facilitating

collection of this information. Opportunities can also be provided to partners with other companies to share information for mutual benefit.

Customer asset management system also requires strong coordination across various customer-facing functions in the organizations' information systems and their marketing programs. This can be achieved by cross-functional interactions in organizations including cross-functional integration for improving the efficiency of the supply chains.

As customer needs and expectations are changing all the time, it will lead to a situation whereby customers keep on setting ever higher standards, and therefore to achieve perfection is impossible.

Knowing the needs of the customer makes it easier to anticipate the ideal set of products and services. A major flaw for all the companies has proved to be their inability to understand other ways that customers can be satisfied. By implementing direct and continuous employee contacts with the customers, the customers' requirements and expectations can be determined. This employee-customer connection additionally conveys the message that the company cares about their customers.

Customer needs can be determined through:

- Market research
- Customer interviews
- Reading customer concerns
- Involving customers in the design of services and service deliveries

Market research could be a useful technique for discovering why new customers switch their supplier and why defected customers left. Frequently, defected customers give "easy" answers, but in-depth interviews reveal the real reasons.

A customer satisfaction study should begin by asking about the factors affecting customer satisfaction, how important those factors are for the whole, and the level of customer satisfaction.

After the real reasons are determined, the service recovery process can begin, and this is frequently the last chance for retaining the customer.

### **Customer Asset Management and Supply Chain Management**

Customer asset management plays a vital role in the context of supply chain management. The supply chain productivity can be improved through the investments in marketing, sales, and customer service. The critical information collected from the consumers questions and suggestions help organization to produce consistent and quality products. Customer contacts can also serve as a source of new product idea.

Though customer interaction has been proved worth, the computerization of marketing and sales function in organizations has not received so much attention. Only a very few companies have realized the importance of technology for their strategic benefits and require better understanding of automation for marketing and sales function, its working and implementation.

### **Benefits of Supply Chain Integration**

- Develop intelligent information infrastructures that provide suppliers, trading partners and customers with consistent and relevant information
- Create a flexible, standards-based infrastructure that can more readily adapt to meet business requirements
- Automate business processes and streamline workflows to improve efficiency and productivity
- Reduce employee training time by improving application usability
- Improve customer service by providing 24x7 web self-service
- Reduce costs by eliminating expensive and inefficient paper-bound processes



### **11.3 ONLINE SALES FORCE**

To reduce order fulfillment cost and shorten the delivery cycles in such a competitive environment where business organizations have to differentiate product/service, increase configuration and new specification of the products, improve customer service to attract customers and reduce operating cost, online sales function plays a critical role for the success of any business organization.

By supporting the sales person in the field through automation means using a computer-based application for collecting data on consumers, maintaining records such as customer visits, phone calls and correspondence. A catalog of marketing literature and other information for communication to sales representatives or customers can also be maintained in the form of database which may be used to interpret field data for predicting sales volume that may occur. Automation helps in eliminating the boundary limits and brings customers closer to the business organization. Automation creates virtual offices, which reduces sales call costs and increase salesperson's productivity.

Sales force management systems are information systems used in marketing and management that automate some sales functions. They are frequently combined with a marketing information system, in which case they are often called customer relationship management systems.

Sales Force Automation satisfies following three main functions:

1. To support the sales force in the field.
2. To provide right information to customer at right time.
3. To integrate sales activities with effective information system to improve overall corporate efficiency and also coordination with other business activities.

#### **Benefits of Sales Automation to Sales People:**

Online sales force automation systems can improve the productivity of sales personnel in the following manner:

1. Rather than write-out sales reports, activity reports, and/or call sheets, sales people can fill-in prepared e-forms. This saves time.
2. Rather than printing out reports and taking them to the sales manager, sales people can use the company intranet to transmit the information. This saves time.
3. Rather than waiting for paper based product inventory data, sales prospect lists, and sales support information, they will have access to the information when they need it. This could be useful in the field when answering prospects' questions and objections.
4. The additional tools could help to improve sales staff morale if they reduce the amount of record keeping and/or increase the rate of closing. This could contribute to a virtuous spiral of beneficial and cumulative effects.
5. These sales force systems can be used as an effective and efficient training device. They provide sales staff with product information and sales technique training without them having to waste time at seminars.
6. Better communication and co-operation between sales personnel facilitates successful team selling.
7. The software could automatically generate more and better-qualified sales leads.

This technology increases the sales person's ratio of selling time to non-selling time. Non-selling time includes activities like report writing, travel time, internal meetings, training, and seminars.

#### **Benefits of Sales Automation to the Sales Manager:**

Sales force automation systems can also affect sales management in the following manner:

1. The sales manager, rather than gathering all the call sheets from various sales people and tabulating the results, will have the results automatically presented in easy to understand tables, charts, or graphs. This saves time for the manager.
2. Activity reports, information requests, orders booked, and other sales information will be sent to the sales manager more frequently, allowing him/her to respond

more directly with advice, product in-stock verifications, and price discount authorizations. This gives management more hands-on control of the sales process if they wish to use it.

3. The sales manager can configure the system so as to automatically analyze the information using sophisticated statistical techniques, and present the results in a user-friendly way. This gives the sales manager information that is more useful in:

- providing current and useful sales support materials to their sales staff.
- providing marketing research data such as demographic, psychographic, behavioral, product acceptance, product problems detecting trends.
- providing market research data such as industry dynamics, new competitors, new products from competitors, new promotional campaigns from competitors, macro-environmental scanning detecting trends.
- coordinating with other parts of the firm, particularly marketing, production, and finance.
- identifying most profitable customers, and problem customers.
- tracking the productivity of sales force by combining a number of performance measures such as revenue per sales person, revenue per territory, margin by product category, margin by customer segment, margin by customer, number of calls per day, time spent per contact, revenue per call, cost per call, entertainment cost per call, ratio of orders to calls, revenue as a percentage of sales quota, number of new customers per period, number of lost customers per period, cost of customer acquisition as a percentage of expected lifetime value of customer, percentage of goods returned, number of customer complaints, and number of overdue accounts

### **Benefits of Sales Automation to the Marketing Manager:**

Online sales force automation systems is also claimed to be useful for the marketing manager. It gives the marketing manager information that is useful in:

1. understanding the economic structure of an industry

2. identifying segments within the market
3. identifying target market
4. identifying best customers
5. doing marketing research to develop profiles (demographic, psychographic, and behavioral) of core customers
6. understanding competitors and their products
7. developing new products
8. establishing environmental scanning mechanisms to detect opportunities and threats
9. understanding company's strengths and weaknesses
10. auditing customers' experience of the company's brand in full
11. developing marketing strategies for each of the products using the marketing mix variables of price, product, distribution, and promotion
12. coordinating the sales function with other parts of the promotional mix (such as advertising, sales promotion, public relations, and publicity)
13. creating a sustainable competitive advantage
14. understanding where brands to be in the future
15. providing an empirical basis for writing marketing plans on a regular basis, and
16. providing input into feedback systems to help monitor and adjust the process

**Strategic Advantages of Sales Automation:**

Online Sales force automation systems can also create competitive advantage in the following manner:

1. The productivity will increase. Sales staff will use their time more efficiently and more effectively. The sales manager will also become more efficient and more effective. This increased productivity can create a competitive advantage in three ways:
  - it can reduce costs,
  - it can increase sales revenue, and

- it can increase market share.
2. Field sales staff will send their information more frequently. Typically information will be sent to management after every sales call (rather than once a week). This provides management with current information, information that they will be able to use while it is still valuable. Management response time will be greatly reduced. The company will become more alert and more agile.
  3. These systems could increase customer satisfaction if they are used with wisdom. If the information obtained and analyzed with the system is used to create a product that matches or exceeds customer expectations, and the sales staff uses the system to service customers more expertly and diligently, then customers should be satisfied with the company. This will provide a competitive advantage because customer satisfaction leads to increased customer loyalty, reduced customer acquisition costs, reduced price elasticity of demand, and increased profit margins.

### **Disadvantages of Sales Automation:**

Detractors claim that sales force management systems are:

1. process that require continuous maintenance, information updating, and system upgrading
2. costly
3. difficult to integrate with other management information systems

### **Elements of Online Sales Force Automation:**

Online Sales force automation systems helps to integrate sales activities with effective online information system to improve overall company efficiency and also coordination with other business functions. Using latest technology, online sales force automation systems increase productivity and can create a competitive advantage with reduced costs. It can increase sales revenue and market share.

A fully integrated sales automation system (in which employees from central location and sales force from remote location work from a distributed database of customers) includes the following elements:

1. **Online telemarketing:** managing demand creation, processing responses etc.
2. **Sales force planning and productivity tools:** planning and reporting of sales calls, entering orders, checking inventory etc.
3. **Sales and marketing management:** providing automated reports about sales forecasts, sales activity etc., analyzing marketing and sales programs.
4. **Online mailing management:** maintaining mailing lists, customizing letters, managing literature inventory etc.
5. **Sales process management:** sales process is the most important factor in sales automation systems and should be analyzed effectively for problems like customer service, operations and minimizing associated sales support costs etc.
6. **Sales force compensation management:** to develop incentive compensation solutions for various selling channels.

With the online sales automation system, the work of a single sales person or entire marketing and sales operation of a company can be performed.

### **Intranet and Sales Automation**

The intranet-based sales automation system is that which exists within an organization and provides a single point of access to all essential information regarding sales and marketing to the business organizations. The information about the competitors such as product, pricing, and sales trends can also be available to the business organization on the intranet-based system.

The interactive web monitoring software helps sales representatives through “smart” solution in answering requests for product literature, reducing the time spent on entering

orders, compiling sales reports etc. Thus direct sales and direct marketing become more efficient by automating highly repetitive tasks.

Intranet can also be used to educate and inform sales persons through electronic publishing which is easy to use, inexpensive, and can be easily updated. The intranet-based sales automation system extends information sharing beyond the boundaries of business firms. The collection and analysis of these information improve the timeliness and quality of decision making of the sales executives.

The intranet enabled sales automation framework benefits the business organizations in the following ways:

- Build a strong sales database by storing all essential information on customer, market, prospects, products, product line, marketing programs, distributions systems, and marketing channels.
- Scheduling the sales operations and compilation of information is easier.
- Reduces the sales cycle.
- Complete automation provides a single point access to all from management to sales persons.
- It helps to access industry data like growth rate of industry, entries and exits of firms and market potential of industry
- Provide data on competitors like their products, pricing, sales promotion, sales trends, and market share etc.
- With the availability of interactive web monitoring software makes its possible to delivers the important and specific sales information directly to the desktop of each sales person.

**Intranet and Mobile Sales Force:** The recent trend in sales automation is towards finding solution to serve the needs of mobile sales force. The sales persons in the field are expected to be in touch with the customers as it provides better understanding of the needs and wants of consumers. But at the same time sales person is also required to be

integrated with back-office system to gain access to data on pricing, promotions, transportation schedules etc. The person kept informed through intranet on both these sides will be an effective sales representative. Companies are providing their sales force laptops and linking them through the intranet to obtain maximum sales productivity.

**Integrating the Web with Contact Management:** To be in contact with customers round the clock, organizations are floating their websites. The objective behind is to attain better sales productivity. Customer information relevant to sales received through e-mails or web site is transferred to the sales data base.

**Intranet and Target Marketing:** Intranet helps in providing the customer contacts and their relevant information which can aid to the direct marketing. When a customer fills up his interest level and information on external web page, immediately a telesales person is automatically assigned to him. On the other hand, sales representative gets the complete information of the consumer including name, address etc. and can start work accordingly which can result in increasing the productivity of the sales force. Intranet enables access to the central database, thereby providing sales people and direct marketers with information to improve the quality of the contact whether it is by mail, by telephone, or in person.

**Publishing Dynamic Sales Information:** With the updates in pricing lists, competitive information and new promotions, the sales environment changes constantly. It is important to keep informed every one. Intranet is ideal medium for business communication as it can provide universal access to dynamic, latest sales intelligence for both connected and disconnected mobile users. Building and maintaining dynamic sales information is very complex, especially in big organizations that have huge quantities of sales materials in a variety of formats and media. The intranet is designed to overcome these obstacles and ensure that business organizations can provide pertinent information to the authorized sales people well in time.

**Management Issues – Sales Force Automation**



The objective of using intranet for sales functions is to reduce marketing inertia. Marketing people accustomed with these systems are able to analyze customer behavior, device new account management policies and marketing mix strategies. With the understanding of these technological resources, management has to focus on achieving corporate goals rather than the goals of individual marketing or sales groups. Automation provides complete customer and marketplace information and thereby more informed decision making. In this way, marketers can get low-cost, low-impact selling methods like direct mail and catalogs. At the same time, high cost, high impact selling methods like personal selling can become more efficient as information systems reduce non-selling time and synchronize the use of these resources.

#### **11.4 ONLINE CUSTOMER SERVICE AND SUPPORT**

Customer management is the most valuable asset for any business organization and businesses have invested heavily in customer service systems to gain competitive advantage. Automation in organizations has completely changed the way; practices were followed about customer service and support.

##### **The Web and Customer Service**

Business organizations have their own websites and e-mail systems to respond to customers quickly, interactively and eventually in real time. Customers get service through web site when they want it at their own level of interest. Not only the up-to-date information about the products and services is provided to customers over the web when needed, but also to inform new products and services, receiving customers' ideas and setup a dialog. In fact, web redefines the relationship between customers and business organizations.

**Information Systems Challenges:** In business organizations committed to building world class service operations, it is too complicated and time consuming to develop an information system fully functional and integrated with the rest of the company's operations. However, these systems need to be cost effective, easy to deploy, and easy to maintain and modify.

## **The Role of Technology in Customer Service**

Web forms, e-mail and usual telephone calls are generally the means of service requests and could be internal (from an employee) or external (from the customer about the product). Whether internal or external is the service request, the support staff has to satisfy the customer.

To provide superior service, business organizations have to develop strong information systems for assuring the quality as consumers have become more sophisticated and demanding. So the basic business requirements need to be scanned for online customer service.

## **What are the Business Requirements?**

When the customer is the king and companies are talking of delighting the customers, one has to remain responsive and competitive. Good customer service strategies and technology resources for delivering services and managing large volume of transactions efficiently requires a well designed customer service system that can yield greater customer loyalty. Companies have to understand the importance of customer interaction and need to take as an opportunity to serve the customers in a better way; get feedback of existing products and input for new product development; sell new products and services; and enhance the relationship. The basic business requirements for such a system include:

- **Hunger for Customer Feedback:** Information about customer satisfaction, product quality and performance helps business organization to reevaluate their processes, predict trends and opportunities. Customer service function can make it possible through right incentives that customer may be willing to share information about themselves and about the kind of products and services they are looking for.
- **Cross-selling and Up-selling:** The customer Asset Management has made the concept of cross-selling existing customers and up-selling product line

very prominent. Cross-selling is a key business concept in which sales representatives attempt to sell the other products also from the company's product line along with the product which already has been availed by the customer. The customers are motivated by the sales people of the company while sorting out the problems and queries, regarding the products which they are presently experiencing. Technology can help by providing effective information in this regard that could serve the customer needs.

- **Field Service Management:** To perform field services in a cost effective manner, organizations need the ability to allocate, dispatch, and manage all of the people, tasks and materials. The software can schedule all these activities and help to coordinate with one another.
  
- **Help Desk Management:** In this fast changing technology environment, internal users in the organization also require the attention so as to provide effective customer service. They should be supplemented with the software which has the following key features:
  - Easy access to customer data
  - A support knowledge base
  - Reporting capabilities

### **The Enabling Intranet Technology**

To solve all types of problems of the customers at every interaction, may be the specific problems beyond the area of expertise of customer service representative, need a variety of tools incorporated in a single enterprise customer asset management solution and this solution can help representative satisfying customers by providing effective service.

**Informational Needs for Effective Service:** Prompt and accurate responses from representatives and feedback from future product development are two important factors

that serve delight on the part of customer service as well organization's product effectiveness.

**Accessing Service Information:** The information such as installation history, warranty term, service contracts help organizations to manage costs for labor, service revenues, decisions about pricing of services etc. These information not only help to better manage, but also to improve existing products and new product designs according to customers' expectations.

**Recording Customer Feedback:** Different departments require different types of information in the form of feedback of the customers in any organization. However, contacting customers for the information in customer service area is seldom lengthy and requires questions to be asked from customers very carefully by the concerned authorities of the organization.

## **11.5 TECHNOLOGY AND MARKETING STRATEGY**

In today's information-intensive environment, where complex marketing processes are generating new distribution and communication channels, multiple pricing options, and customized products and services, the traditional marketing mix strategies using product, price, place and promotion are not sufficient. Organizations have to use the technology to be enabled to dynamically allocate marketing resources to those activities that generate the best return and have to consider the following issues:

1. How marketing challenges such as global competition can be faced through technology?
2. What should be the technology infrastructure and technology applications for marketing management?
3. How information can affect the decision making and marketing strategies?
4. How can technology help to reduce the complexity and to lower the cost while the firm expands into new market?
5. What cost effective strategies can be used to market and advertise effectively?

For developing marketing strategy in reference to above mentioned issues with the application of technology, organizations can look at the following:

### **Marketing Decision Support Systems**

The increased competition and changing market structure have led the shortening of a product life cycle and for the survival and profitability, organizations require new product innovations. For this, detailed, accurate and timely information relevant to the product is needed.

- **Data Mining and Decision Support:** Data mining is an emerging solution for marketing decision support in organizations to get optimum performance by knowledge workers. It enables to access and manipulate data easily, and knowledge workers can use the data creatively.

In general, data in the data warehouse has certain characteristics that differentiate data mining from the conventional operational systems. These include:

- Data is not organized for a specific process or application, but as per the managers desire to view it. So the data is subject oriented.
- Data from many sources where it is usually inconsistent is transferred to the data warehouse and integrated through a consistent naming convention.
- Data should be collected and organized over time for identifying trends and forecasting. So the data must be time variant.
- Data in the data warehouse is nonvolatile and neither updated nor changed, but only accessed and reloaded.

### **Marketing Decision Support Applications**

The applications can be classified as follows:

- **Customer Order – Planning, Forecasting and Fulfillment:** To know what, when, and where the customer demand the products to be delivered, order processing system is examined. It helps in managing all parts of the supply chain. Improved inventory control by understanding this customer order processing system helps the organizations to meet customers' needs. So, the business firms can reduce the inventory costs through improved stock control by understanding customer ordering and can result in effective planning, forecasting and fulfillment of customer order.
- **Customer Relationship Management (CRM):** CRM is a marketing function and has a strong impact on marketing strategies. To know the wants and preferences of customers in a well defined manner, and the level of reliability of information, management can use technology. Business firms also use this technology to analyze the global trends and for understanding why breaking down of sales cycle has happened.
- **Trend Analysis:** With the use of data mining technology organizations can precisely be able to know the classification of sales which would help in predicting some items experiencing low turn and others high. This classification trend analysis also help in sales and profit mix planning and inventories can be adjusted accordingly.
- **Channel Management:** Technology allowing business organization to interact directly with customers and react to changes in demand, ultimately affect the supply chain. Better customer values can only be provided through a marketing mix strategy that contributes to lower system costs or improved differentiation for the entire supply chain. So channel management provides a new impetus for integrating marketing processes, distribution, and manufacturing.

## **11.6 SUMMARY**

Customer Asset Management is the integration of the front-line activities in a supply chain namely sales, market intelligence gathering and customer service to act in a coordinated manner rather than pulling in different directions. Customer Asset Management is an economically prudent manner to drive sustainable, long-term and profitable customer relationship.

Customer Asset Management highlights the importance of customers and defines them as the most valuable asset of any business. In this competitive environment, the trends of attracting and keeping customers are changing and customer information systems are built or created as 'islands of information' with an integrated software application where technology is used in a strategic manner for customers.

Collecting information relevant to customers for making customer asset management as asset base may be difficult and costly. This problem can be overcome by using the web, intranets and other online services by purchasing better hardware and developing sophisticated marketing oriented software that can help in building sound customer databases to share information for mutual benefit and to facilitate the customer online and instant information system and providing attractive incentives for customers facilitating collection of this information.

Though customer interaction has been proved worth, the computerization of marketing and sales function in organizations has not received so much attention. Only a very few companies have realized the importance of technology for their strategic benefits and require better understanding of automation for marketing and sales function, its working and implementation.

By supporting the sales person in the field through automation means using a computer-based application for collecting data on consumers, maintaining records such as customer visits, phone calls and correspondence. A catalog of marketing literature and other information for communication to sales representatives or customers can also be

maintained in the form of database which may be used to interpret field data for predicting sales volume that may occur. Automation helps in eliminating the boundary limits and brings customers closer to the business organization. Automation creates virtual offices, which reduces sales call costs and increase salesperson's productivity.

The intranet-based sales automation system is that which exists within an organization and provides a single point of access to all essential information regarding sales and marketing to the business organizations. The information about the competitors such as product, pricing, and sales trends can also be available to the business organization on the intranet-based system.

Marketing people accustomed with these systems are able to analyze customer behavior, device new account management policies and marketing mix strategies. With the understanding of these technological resources, management has to focus on achieving corporate goals rather than the goals of individual marketing or sales groups. Automation provides complete customer and marketplace information and thereby more informed decision making. In this way, marketers can get low-cost, low-impact selling methods like direct mail and catalogs. At the same time, high cost, high impact selling methods like personal selling can become more efficient as information systems reduce non-selling time and synchronize the use of these resources.

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To provide superior service, business organizations have to develop strong information systems for assuring the quality as consumers have become more sophisticated and



demanding. So the basic business requirements need to be scanned for online customer service.

To solve all types of problems of the customers at every interaction, may be the specific problems beyond the area of expertise of customer service representative, need a variety of tools incorporated in a single enterprise Customer Asset Management solution and this solution can help representative satisfying customers by providing effective service.

In today's information-intensive environment, where complex marketing process are generating new distribution and communication channels, multiple pricing options, and customized products and services, the traditional marketing mix strategies using Product, Price, Place and Promotion are not sufficient. Organizations have to use the technology to be enabled to dynamically allocate marketing resources to those activities that generate the best return and have to consider the following issues:

The increased competition and changing market structure have led the shortening of a product life cycle and for the survival and profitability, organizations require new product innovations. For this, detailed, accurate and timely information relevant to the product is needed.

Data mining is an emerging solution for marketing decision support in organizations to get optimum performance by knowledge workers. It enables to access and manipulate data easily, and knowledge workers can use the data creatively.

## **11.7 KEYWORDS**

**ATTRITION:** Customer may be dissatisfied with the service, find a better price elsewhere or feel arduous of existing services. This is known as attrition

**CROSS SELLING:** concept in which sales representatives attempt to sell the other products also from the company's product line

**DATA MINING:** It is technique of extracting data from data warehouse

**CRM:** Customer Relationship Management

## **11.8 SELF ASSESSMENT QUESTIONS**

1. What is Customer Asset Management?
2. Discuss the main challenges in implementing the Customer Asset Management.
3. What is sales force automation? Discuss its elements.
4. What do you understand by customer service and support? Discuss the role of technology in customer service.
5. Explain the relevance of technology with marketing strategy.
6. Describe some of the applications of marketing decision support systems.

## **11.9 SUGGESTED READINGS**

- Kalakota, Ravi and Whinston, Andrew B. “Electronic Commerce – A Manager’s Guide”, Pearson Education, Inc.
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# **LESSON: 12**

## **INTRANET AND MANUFACTURING**

**Subject: E-COMMERCE**

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### **STRUCTURE**

- 12.0 Objectives
- 12.1 Intranet and Manufacturing – An Introduction
- 12.2 Integrated Logistics
- 12.3 Agile Manufacturing
- 12.4 Emerging Business Requirements
- 12.5 Manufacturing Information Systems
- 12.6 Intranet-based Manufacturing
- 12.7 Logistics Management
- 12.8 Summary
- 12.9 Keywords
- 12.10 Self Assessment Questions
- 12.11 Suggested Readings

### **12.0 OBJECTIVES**

The motive of this chapter is to present an introduction to Intranet and Manufacturing and within that framework the key basic concepts, challenges of integrated logistics, emerging business requirements, manufacturing information systems, intranet-based manufacturing, and logistics management using technology in the manufacturing are discussed.

After going through this lesson, you will be able to:

- Describe the use of intranet in manufacturing.

- Explain the reasons for understanding the concept of integrated logistics.
- Describe the role of online technologies, agile manufacturing, and emerging business requirements.
- Discuss the manufacturing information systems.
- Describe intranet-based manufacturing and logistics management.

## **12.1 INTRANET AND MANUFACTURING – AN INTRODUCTION**

Intense global competition, unpredictable customer demand and material availability are the compelling factors for the manufacturing companies to reengineer their operations to produce and distribute products effectively at low cost and high quality as customers are demanding customized products at mass-produced prices. In such a global competitive environment, manufacturing companies have to devise certain strategies such as manufacturing resource planning, total quality control, just-in-time capacity optimization techniques, and demand flow manufacturing. It has also to be recognized by the manufacturing companies that not only focusing on price and quality but shortening the cycle from order to cash receipts i.e. to deliver product faster by managing the entire supply chain is equally important. Companies who can not manage the supply chain more competitively are falling behind more rapidly.

In this changing business environment with changing customer demands, information technology is a tool for manufacturers to manage their suppliers as well as customers. Internet can increasingly be seen as a vital instrument in improving performances. Manufacturing is one area where a vision of extensive coordination through computerization has been articulated. This vision, computer integrated manufacturing, is usually advanced as a next stage for improving manufacturing efficiencies and performance by reducing intra-organizational coordination costs. Hence, manufacturers have to understand the importance of Internet and Intranet for managing inventories and schedule shipments. Manufacturers have to find new flexible ways to control suppliers and retailers; and redesign processes for integrating organization with decentralized operations through the implementation of e-commerce, web and intranet in their organizations.

The concept of supply-chain has gained popularity in a very less time over the old supplier-to-customer model at both national and international level and emerged as a “virtual corporation”. A well-managed supply chain gives a boost to the companies in the competitive environment. The supply-chain requires a strong information system to maintain the edge and manufacturers are very much serious on this issue. For instance, to manage inventories and schedule shipments, manufacturers use internet frequently to be in contact with the suppliers for material procurement.

## **12.2 INTEGRATED LOGISTICS**

Success in today’s business environment requires effective management of the integrated logistics, a comparatively new discipline that grew out of the integration of materials management and physical distribution system. Business organizations for their competitive advantage need to be linked internally across their business functions as well as externally with other firms. These organizations use logistics as a tool to effectively manage the materials and distribution system in the supply chain by establishing inter-firm linkages.

The optimum utilization of products, materials, resource, and space can help reducing operating costs, improving service levels and reducing order cycle times. This can be made possible only by strategically managing the logistics operations or in other words by integrating the functions of logistics in an organization. These logistics functions are

- Supplier management
- Inventory management
- Distribution management
- Warehouse management.

**Supplier management:** The planning for purchasing and distribution in inventory system is essentially needed for customized manufacturing. Automating the supply chain helps to simultaneously plan the entire network, and simplify routine transactions from

daily procurement activities to automatically release purchase orders to suppliers. Business automation also helps in reduced paper handling. Organizations can electronically communicate purchase orders, delivery schedules, and associated invoiceless payments to their suppliers. The trend in purchasing is to reduce the number of suppliers and get them to become partners in business in a win-win relationship by reduced purchase order processing costs; lesser staff requirement to process purchase orders, and reduced order processing cycle times.

**Inventory management:** When manufacturers are electronically linked with suppliers, information can be sent instantly which will enable them to maintain reduced inventory level and on the other hand, the chances of out-of-stock occurrences are minimized. The main goal of inventory management is to cut down the order-ship-bill cycle.

**Distribution management:** Reduced paper handling is the result of electronic communication. The shipping documents such as purchase orders, advanced ship notices etc. can now be sent instantly with more accuracy as compared to past. The complex demand chains have been simplified with effective resource planning. Logistics has played a significant role in optimizing purchasing operations, sophisticated warehouse management and material management.

**Warehouse management:** The activities in all the functional areas such as administration, product storage, shipping etc. need to be optimized for efficient warehouse management by automating the warehouse distribution process. The objective of warehousing management is to improve distribution by automating the processes from receiving and put-away to picking and deployment.

**Intranet and Logistics System:**

The integration of business-to-business e-commerce takes place in various areas of supply chain management including its networking, coordination, planning, and execution. The modern Intranet systems provide the following e-commerce logistic management solutions:

- E-marketplace infrastructure that enables to extend the supply chain processes across enterprise boundaries by linking suppliers, partners, and customers
- Allow users collaborate with colleagues down the hall or across the globe, both inside the enterprise
- Extends the efficiencies and benefits of networked supply chain management to every member of the network
- Allow to align supply chain infrastructures to changing market conditions, such as new product launches and new customer segments, that enable to reduce time to value
- Monitors every stage in the supply chain process, from price quotation to the moment the product arrives at the customer site including alerts when things go wrong
- Monitors and reports on key indicators and objectives of supply chain performance, including costs and assets across the supply chain network
- Integrates technology based buying processes, including rule-based procurement, automated replenishment, and multiple supplier support
- Manages supply chains throughout all stages of the manufacturing process
- Enables to quickly determine where and when to obtain a product, and handles order management, availability checks, and transportation management.

The solutions above mentioned that integrate e-commerce supply chain management are designed to provide the benefits to all elements of logistic system. This integration benefits could be the following:

- Transform from a supply-centric to a customer-centric demand chain, in which actual customer demand drives design, production, and replenishment
- Match supply and demand through integrated and collaborative planning tools
- Reduce inventories
- Increase planning accuracy and real-time location of products around the world, improving customer service

- Better capabilities for planning and scheduling supplier production

### **12.3 AGILE MANUFACTURING**

In an environment where customer and market demands are constantly shifting, businesses are experiencing intense pressure to deliver more goods, more efficiently at an unprecedented rate. To remain competitive, manufacturers and distributors must establish more collaborative supply chains, eliminate inefficient processes and take advantage of agile technologies that can easily adapt to evolving business requirements with speed.

The past few years have seen a change in manufacturing strategies and technologies. The markets have become more and more fragmented and competitiveness has increased. For a manufacturing enterprise to be competitive and thrive in such a dynamic environment it must be capable of adjusting rapidly to the market. Manufacturers are required to make products of better quality in the least amount of time and at the best possible price, to result in the highest degree of customer service/satisfaction. The customers are requiring manufacturing companies to design specifically customized products. For fulfilling these requirements of both customers and manufacturers, it emerges a newer concept 'Agile Manufacturing'.

Agile manufacturing makes use of modern information technology to form effective enterprises. Partners must maintain a high amount of communication and data exchange between themselves for the success of the virtual enterprise. Data exchange does not mean just verbal communication, but the companies must exchange complete information about their products, all the way from design, manufacturing to inspection and shipping. This information should be available to each relevant partner over the entire life cycle of the product.

Within the new global market environment, customer requirements are not limited to traditional issues, such as higher quality, lower price, and so on, but extend to the speed of delivery and variability of products. Therefore, enterprises must be capable of



delivering new products efficiently to the customer-driven market to remain competitive, that is, to maintain “agility.”

Agile Manufacturing involves a broad range of capabilities:

**Product Configurability:** Customized manufacturing requires a flexible and robust enough product configurability to support needed material control techniques and involve the following techniques:

- **Manufacturing data management:** It provides information about routing, cost, and structure of the product to be used for a wide variety of components.
- **Configurability management:** A customer request for a make-to-specification product is attended by automating the configuration and order entry process.

**Product Execution System (PES):** The software which correlates the data for control of manufacturing operations by tracking materials, equipment, personnel, specifications/work instructions and facility conditions of the manufacturing plant. PES software includes the following components:

- **Master Production Scheduling (MPS):** The overall business planning with detailed operations, production and procurement actions as well as day-to-day events in respect of customer demand are identified.
- **Material Requirement Planning (MRP):** The overall business planning with detailed operations, production and procurement actions in respect of day-to-day events are identified.
- **Capacity Planning (CAP):** To find potential capacity and adjust backlog so as to control the production.

- Shop Floor Control (SFL): For evaluating performance, detailed planning, and scheduling, it provides current status of jobs, work-in-process, and production activity.
- Quality Management System (QMS): It implements quality assurance and quality control functions; integrates with production, procurement and inventory control.

The system provides the complete information about the production process and enables manufacturers to identify problems in the areas of cost, quality, service, compliance, and speed.

#### **12.4 EMERGING BUSINESS REQUIREMENTS**

Information technology enabling the manufacturing or logistics systems, current trends, strategies, and the influence of consumer behavior reflect the emerging requirements of business.

##### **Customer-Driven Manufacturing**

In the current manufacturing system, customers are dictating the suppliers from design to delivery of the product as per their requirements and manufacturers have accepted this concept known as customized manufacturing. May be the case of a jeans, or a computer to be purchased, the specifications desired by the customer are fed by the salesperson into a computer with the help of a specialized software which has a number of possible combinations for customizing the product as per customer requirements.

Customized manufacturing having the assemble-, make-, and configure-to-order capabilities are attracting more customers than the traditional manufacturing methods by forcing many of the industries into specifications oriented manufacturing of the products for individual customers. This is also known as product mass customization.

Earlier business organizations adopted this concept of customization for increasing efficiency, reducing operational costs, and downsizing. As downsizing has reached a

point of diminishing returns, the emphasis is shifting from increasing efficiency to increasing revenue and profits. Companies considering revenue growth are finding the needs and wants of consumer for building products and the way consumer desires. To take a competitive advantage, business firms are speeding up the process of customization by offering products that can be configured, built, and shipped to distributors or directly to the consumer within twenty-four hours.

This way of manufacturing must be implemented with a high degree of interconnectivity among finance and logistics functions and with a build-to-order approach of manufacturers.

### **Rapid Internal Response to Demand Changes**

Manufacturers are in a process of organizational and operational restructuring with a view to quickly respond to the changing demands of customers by eliminating the unwanted redundant tasks and the waste as much as possible. This review of the business processes has benefited many of the companies to improve operating margins. So these firms are accepting logistics management as a norm to focus on the customer than to supplier.

For making critical decisions on a final plan of production, manufacturing firms are expecting advanced planning and scheduling systems to perform speedy material resource planning as compared to traditional systems which were taking a long time. This will help these companies to support demand changes through simple, fast and cost effective product customization.

To balance service expectations and return on assets is very critical for manufacturers and requires dynamic management skills. Accomplishing the goal of satisfying the changing needs of the customers may increase the cost, so manufacturers are under pressure how to deliver highly customized level of services to their customers and are manufacturing highly customized level of services to their customers and are maintaining a huge

investment in assets. Manufacturers have to carry these assets in inventory and need efficient planning that can improve overall return on assets.

### **Efficiently Managing Supply Chain Complexity**

Profits can be increased in manufacturing companies by reducing inventory, purchasing, and distribution cost through tremendous management of supply chain which is becoming more and more complex. Manufacturing and logistics supply chain management software that link design, manufacturing, and distribution process through information systems can help to overcome the pressures of complexity in supply chain and enable managers to focus on the coordination and fulfillment of customer orders. Manufacturers would also be in a better position to maintain internal coordination so as to meet the demand of customers quickly with the implementation of this software.

Technology helps manufacturers in terms of demand management and order fulfillment by integrating all the phases from design to assembly of a product and involve activities such as planning and execution, and financial control which can be termed as supply chain management. These technologies also enable manufacturing companies to eliminate needless paper handling using electronic data interchange, bar coding, and electronic data collection devices. So automation may enable the manufacturing companies to effectively handle the pure logistics and the manufacturing functions by completely linking them. In this way all the inter department process may be initiated automatically and concurrently.

## **12.5 MANUFACTURING INFORMATION SYSTEMS**

Manufacturing information systems include two key terms – discrete and process manufacturing which needs to be differentiated. The manufacturing operations may be discrete, batch process, continuous process, combination of more than one form i.e. hybrid. Discrete operation means processing of raw material is done in different units such as the assembly operations in the auto and commercial aircraft industries. Manufacturing industries like pharmaceutical, fast food, beverages, and chemical companies involve batch operations to convert raw material from one state to another in

its various processing phases. Whereas industries like oil refinery involve continuous process operation to process raw material without interruption in a continuous flow and a combination of batch process and discrete operation to manufacture the products is used by producers such as chemical companies known as hybrid.

Process manufacturing differs from discrete operations in respect of manufacturing methods, packaging requirements, asset allocation, and product consistency. In process manufacturing, finished products are created by heating, mixing, or separating single or multiple inputs to create multiple outputs whereas, a single finished product is created by gathering multiple raw material and components inputs, termed as discrete product through discrete operations. Discrete manufacturers have huge investment in inventory whereas process manufacturers have much larger investment in plant and equipment.

### **Types of Manufacturing Information Systems**

The computer software applications designed for various phases of the product life cycle from computer-aided design to computer-assisted production helps in improving efficiency and lowering the costs. Once a product is designed, these software applications for planning and executing production includes manufacturing resource planning systems, enterprise resource planning systems, manufacturing execution systems and control systems for automated equipment. The process of designing and developing manufacturing systems is much similar to traditional approach for identifying business requirements. However, the business environment changes are much more unpredictable today.

### **Manufacturing Resource Planning (MRP)**

Production process is very complex due to several deviations such as customer change requests, production forecast, labor, engineering drawings etc. and result in unnecessary manual intervention. Traditional MRP systems are not good enough as these systems plan on a daily basis and are generally unaware of the real status of all the resources required at an operation and actual processes in the plant. In fact, the problems of manufacturing are rarely reported back in the front office.

In order to develop effective customer-driven model of modern business for material resource planning, detailed scheduling and sequencing must be considered. To project capacity and material requirements for a specific job, certain basic planning rules are applied. This function is performed under modern material resource planning system in order to plan production and purchase orders. Purchase orders collected are grouped together for identifying material requirement and subsequently organized under weekly master production schedule (MPS).

### **Enterprise Resource Planning (ERP)**

The need for enterprise resource planning to replace Material Resource Planning arose due to inadequate flexibility in MRP systems towards customized manufacturing. Enterprises Resource Planning is considered as improved version of MRP system and is strong in support for multiple plants, multiple suppliers, and multiple currencies, and it will schedule an entire multiple, global organization, including functions such as plant management, inventory control, and order processing. All the processes are further integrated with other applications such as human resources, procurement, distribution, and accounts receivable.

The manufacturing plan of raw material, gross capacity, and production orders for the factory floor is prepared by eliminating forecasted demand or order backlog through ERP systems. These systems are also associated with financial transactions and accounting paper work. ERP systems only collect historical yield and cost data so are not able to provide real time information about the complete status of operations and do not support ongoing management of the actual production process as it occurs. Though ERP systems are effective in functions for which they were designed but do not have adequate capabilities to manage the critical variables of the dynamic process on the plant floor. Thus manufacturing execution systems were evolved.

### **Manufacturing Execution Systems (MES)**

MES software helps in improving manufacturing performance by improving efficiency in manufacturing operations at the time when pressures such as cost, quality, service and regulations are increased on manufacturers.

As traditional systems ignore the indirect activity based costing like machine downtime or quality defects that require scrapping or reworking of a product and consider only the cost of producing with in the cost accounting measures, automated manufacturing execution systems need to be developed. To monitor the performance and control the five essential elements of production i.e. materials, equipment, personnel, work instructions, and facilities, manufacturers implement Manufacturing Execution System in their organizations. Planning in these systems is generally accounting oriented and includes functions such as forecasting demand, costing, sales order management, inventory control, accounts receivable, accounts payable, purchasing, and payroll.

There is growing need for Manufacturing Execution System across the industry. Manufacturing Execution System provides a real time clear cut picture of production capacities, resource constraints, inventory levels, and customer orders. The review of different production scenarios prior to actually performing the work can be done through Manufacturing Execution System. They help in maximizing the utilization of available resources and in scheduling the operations based on operation-level requirement than on time requirements. Production can also be monitored with the help of computers via graphic display to track resources, orders, and operations. MES also facilitates electronic verification of orders for accuracy against standards like ISO 9000. Work instructions can also be distributed electronically with corrective actions in the organization when required. Industries like semiconductors have realized the benefits of MES software and accepted MES as a tool for manufacturing but some industries like pharmaceutical still find it unproven concept for benefit realization.

### **Functionalities of Manufacturing Execution System**

- Integration with lab systems, automated control systems: Using real-time data from all other information levels, Manufacturing Execution System reports and

responds to plant activities as they occur, resulting in rapid response to changing conditions.

- Batch/lot management, quality management, specifications and work instructions: Manufacturing Execution System is a plant wide system that provides two-way communications to enable the optimization of production activities from order launch to finished goods.
- Resource management, including scheduling, dispatching, equipment monitoring, preventive maintenance, direct and indirect labor coordination.
- Recipe management, detailed material control and actual cost tracking.

#### **Benefits of Manufacturing Execution System:**

- Shorter manufacturing cycle times (average 45% reduction)
- Faster inventory turnover and lower in-progress inventories
- Production monitoring via graphic display to track resources, orders, and operations.
- More on-time deliveries with better quality and fewer defects
- Utilization of available resources to be maximized.
- Electronic verification of each factory order for accuracy against standards
- Higher return on operational assets, improved gross margins and enhanced cash flow
- The review of different production scenarios prior to actually performing the work.
- Electronic distribution of work instructions with corrective actions when necessary.

The end result is that MES software improves the effectiveness of the manufacturing operations and improves manufacturing performance, quality, and service.

#### **The Future: Integrated Systems**

Excellence in manufacturing process, supply-chain planning and execution is largely predicated on how effective the company is in getting its product to market vis-à-vis its



competitors, and how well the product launch and transition processes are synchronized with its supply chain. Better planning in this area will help companies further drive down costs, especially in industries with short product life cycles (e.g., high-tech manufacturers) and fast-moving consumer goods (e.g., electronics and fashion apparels).

In order to optimize performance, manufacturing and supply chain functions must operate in a coordinated manner. But for many organizations, their entire operation is tied to inflexible legacy technology, inhibiting manufacturing and supply chain integration efforts that e-commerce demands.

The challenge facing industry to make intranet more useful for manufacturing need to consider the importance of material resource planning systems, enterprise resource planning systems and cost account systems, the factory level coordinating and tracking systems, and the factory floor devices and process control systems. So resource planning, manufacturing execution, and distributed control are the three elements that need to be integrated through automation to face the challenge of future. However, only a few manufacturers recognize that for firms to realize greater performance levels, they will need to incorporate production process as an integral component to their other supply chain processes.

### **Emerging Information Technologies**

With the explosive expansion of the internet, communication in the business world increasingly relies on the emerging information technologies, such as network programming, component-based architectures, and so on. Many of these technologies have the potential of being employed by the information systems of virtual enterprises because the nature of the internet is to establish connection between various computing environments.

The integration of e-commerce and ERP takes place in various areas of supply chain management including its networking, coordination, planning, and execution. The

modern ERP systems (SAP, for example) could provide the following e-commerce supply chain management solutions:

- **Private Exchanges:** e-marketplace infrastructure that enables to extend the supply chain processes across enterprise boundaries by linking suppliers, partners, and customers
- **Supply Chain Portals:** allow users collaborate with colleagues down the hall or across the globe, both inside and outside the enterprise
- **Mobile Business:** extends the efficiencies and benefits of networked supply chain management to every member of the network
- **Collaborative Demand and Supply Planning:** enables buyers and sellers to collaborate on demand and order forecasting, synchronizing plans based on the dynamic exchange of information
- **Supply Chain Design:** allows to align supply chain infrastructures to changing market conditions, such as new product launches and new customer segments, that enable to reduce time to value
- **Supply Chain Event Management:** monitors every stage in the supply chain process, from price quotation to the moment the product arrives at the customer site - including alerts when things go wrong
- **Supply Chain Performance Management:** monitors and reports on key indicators and objectives of supply chain performance, including costs and assets across the supply chain network
- **Collaborative Procurement:** integrates web-based buying processes, including rule-based procurement, automated replenishment, and multiple supplier support
- **Collaborative Manufacturing:** manages supply chains throughout all stages of the manufacturing process - even across enterprise boundaries
- **Collaborative Fulfillment:** enables to quickly determine where and when to obtain a product, and handles order management, availability checks, and transportation management.

The above listed solutions that integrate ERP and e-commerce supply chain management are designed to provide the benefits to all elements of supply chain.

For the customers, this integration benefits could be the following:

- Provide quick delivery times
- Enable permanent access to the enterprise selling capabilities
- Lower cost for the Internet-related purchases.
- Access detailed and accurate order status information, resulting in higher customer satisfaction
- Transform from a supply-centric to a customer-centric demand chain, in which actual customer demand drives design, production, and replenishment.

For the enterprise, the main link in a supply chain, the e-commerce integration with ERP systems might provide the following benefits:

- Quickly and easily compare suppliers on a global basis
- Match supply and demand through integrated and collaborative planning tools.
- Reduce inventories
- Collaborate with partners and optimize supply planning and execution across enterprise boundaries
- Achieve faster responsiveness to unanticipated demands
- Introduce new products and promotions with efficiency and accuracy
- Increase planning accuracy and real-time location of products around the world, improving customer service
- Respond to changing customer requirements quickly and efficiently.

For the suppliers, the value proposition in the integrated ERP and e-commerce supply chain could mean:

- Better capabilities for planning and scheduling supplier production
- Faster responsiveness to unanticipated demands

- Collaboration with customers on forecasting, new product design, and delivery schedules.

## **12.6 INTRANET BASED MANUFACTURING**

Intranet-based software solutions with innovative approach are covering all the current manufacturing issues and ready to serve the global marketplace maintaining competitive advantage. The standard design of these systems encompasses of three critical concepts i.e. customer-driven manufacturing, real-time decision support, and intelligent process management.

### **Customer-Driven Manufacturing**

Information systems have changed the focus of manufacturers from factory management to demand management by reducing cycle times using various approaches like JIT and flow manufacturing. Fax, phone, e-mail, web page, and electronic data interchange are the means to receive the demand from customers and suppliers. Demand flowing through information system helps in managing inventory reserved, production allocated or scheduled; and planning the resources by processing concurrently all the activities. If there is a change in demand, system reschedules the resources and instantly provides information to the user about this.

The creative use of technology like e-mail, electronic data interchange, or electronic forms helps manufacturers to address consumers and suppliers directly with a very little intervention of a human being and facilitate flow-through replenishment and fulfillment; electronic commerce (for supplies, raw materials, and finished product); line sequencing and allocation; and demand-driven manufacturing (concurrent and linked processing to the automatic receipt of demand). Basically, it represents a shifting of material resource planning from traditional 'push' model to 'pull' orientation.

### **Real-Time Decision Support**

The conventional MRP engine was time consuming and working in the batch processing mode because of the high volume of data required. These systems could be run during

off-hours, typically weekly. They were based on single resource optimization that is performed in a linear fashion. However, between the last batch run and the next schedule run, the plant is operating outdated and, in some cases, inaccurate information. This traditional system is being replaced with an advanced system based on real-time planning and scheduling by the companies which can process the job very effectively in a very less time using the technology.

The planning system allows the combination of multiple resources into single planning runs such as material and capacity or material and costs. Planners can get predicted data through these advanced planning systems in order to synchronize with the supply chain execution processes such as rescheduling, production order creation, purchasing, transfers, capacity leveling etc.

### **Intelligent Process Management**

Administrative workflow elements are involved in all business applications and include:

- anything that required approvals such as purchase requisitions;
- review of exceptions on a periodic basis for lot expiration, material shortages, and cost variances; and
- sequenced production activity that involves movement from one operation to the next, purchase requisitions to suppliers, and distribution.

The traditional systems found these tasks far beyond their purview and required them to be handled through manual processes.

Workflow technology targeting on these elements enables to improve work quality and reduce processing time and cost. In fact, workflow computerizes the flow of information from one place to another and uses intelligence to get the right work to the right person at the right time for the right action. Applying workflow technology, the intranet applications act as a virtual manager, shifting through the information stream using business rules to identify aberrations or out-of-tolerance conditions, and routing work to the operations personnel who can fix the process. Workflow can also be used for

proactive notification. For instance, by monitoring crediting conditions in the payment management function, workflow notifies a specified account representative to take action and call customer and results into higher customer satisfaction. Thus an integrated workflow engine can automate, streamline, and control the flow of information across the enterprise, running distribution, manufacturing, and financial applications.

## **12.7 LOGISTICS MANAGEMENT**

Logistics management and distribution management, the two terms that appear to be used synonymously have different meanings, are the processes that move goods through the supply chain. A good logistics management often determines the success of a business. It is concerned with the strategy and management of the movement and storage of materials and products from suppliers to retail outlets and customers through the distribution system of the organization. Logistics management attempts to achieve a balance between holding minimum stock while providing the best service possible to the customer.

### **Problems with Traditional Logistics Management**

In the traditional logistics approach, warehouses were responsible for storage and handling of inventory. From delivery to a distribution center as an inbound load of product to picking up against an outbound order logged into the company's inventory system was a very slow process and may have taken several days or even weeks, during which time product sat in inventory. Traditional logistics management faces the following major problems:

- **High Inventory:** Firms store high inventory without strategically estimating in the traditional supply chain at different storage location or inventory places. By the time the end of chain is reached, inventory levels bear almost no relation to actual demand.
- **Very slow to react:** Due to the disjointed reordering process along the supply chain, the traditional distribution approaches are very slow to react and may never catch up with hot product demand.

- Treating all items in the same manner: Companies carry similar levels of inventory for both volatile and non-volatile items and distribute them through one type of logistics network.

However, in today's logistics-savvy environment, manufacturers and retailers are finding relief with the electronic messaging systems that help in controlling the inventory and speeding up the process of distribution.

### **Objective of the Modern Logistics Function**

Delivering the right product to the right place at the right time and at the right quality level frames the objective of the logistics function in the modern time. To accomplish this objective, predefined service availability for the given range of products, cost levels, operations; and minimizing inventory levels are needed to be managed by the inventory logistics function. A retail logistics function may typically include the objective as to deliver the product ordered by the store on time, in good condition, intact, with documentation that is the minimum required for accuracy and efficiency of operations, and all at a minimum cost.

A sound information system is required to pass information up and down to each function of the supply chain so as to inform about the requirements and status of the product to be distributed in order of achieving the objective of modern logistics function.

### **Forecasting**

Forecasting, as an important part of logistics and inventory management, helps in minimizing the amount of inventory held within the business, advising restocking of inventory, and providing recommendations on when and how much to order. Past sales data and advanced algorithms of forecasting are used to make an accurate estimate of future demand.

Seasonality factor makes the forecasting much complicated in case of retailing. Seasonality may be event-related or weather-related. For example, sweets are at high demand on the festival of Diwali in India. Warm cloths with new styles and colors are demanded in the winter season. So retailers have to understand the importance of seasonality for accurate demand forecasts.

### **Purchasing**

The act of placing an order on a supplier is called purchasing and can be divided into three major activities:

**Purchase Contract Management:** The decision, taken by a buyer to purchase goods from a particular supplier in the essence of long term relationship between the two, takes the form of a contract between them and is essentially the management of the supply of the agreed goods.

**Purchase Order Management:** In order to review required order quantities, placing an order on a supplier, and management of payment for goods received by the buyer, the concept is used. In the recent time, EDI is becoming more common by reducing the lead time in the supply chain as suppliers receive orders quickly and can dispatch goods earlier.

**Receiving and Warehouse Management:** The process of accepting goods into the warehouse is called receiving. Goods received are counted and checked against the purchase order and the stock position is updated in the warehouse. Quality controls are established by most of the retailers. Taking a sample of the goods received, auditing is done against the quality standards of the organization. Accounts payable is then notified that the order from the supplier has been accepted.

### **Distribution Management**

The planning, coordination, and control of the physical movement of goods received from suppliers in the distribution center, supply depot, or warehouse are the concerns of



distribution management. It includes the movement, storage, and processing of orders for finished goods received into warehouse or in retailer's area of control.

Distribution management includes the following processes:

**Distribution Requirement Planning (DRP):** To assess the quantity, type, and location of distribution centers throughout the area, the distribution system is required to serve and plans for capacity loads on warehouses, labor, and transport.

**Physical Inventory Management:** To measure the level of stockholding and frequency of restocking for products.

**Warehouse Management:** To maintain a balance between the cost of the operation (for labor, space, and equipment) and the desired level of service to the stores, warehouse management is concerned with managing stock location, product putaway and picking, receiving and dispatch, as well as performance monitoring of these processes.

**Transport and Fleet Management:** Fleet planning, fleet managing, load planning, vehicle scheduling, route planning and scheduling and vehicle tracking and monitoring comes under this process. In short, transport and fleet management is concerned with electing the modes of transport and the ways to manage them.

**Labor Management:** Labor and workload planning, labor performance monitoring, time and attendance recording and analyzing the personnel and payroll information comes under this process.

The physical nature of the operations and warehouses play an important role being integral part of the supply chain to maintain supply and demand aspects of any business. However, introduction of technology and sophisticated software have changed the emphasis by offering the opportunity for increased effectiveness.

## **12.8 SUMMARY**

Intense global competition, unpredictable customer demand and material availability are motivating the manufacturers to reengineer their operations to produce and distribute products effectively at low cost and high quality as customers are demanding customized products at mass-produced prices. In this changing business environment with changing customer demands, internet can increasingly be seen as a vital instrument in improving the performances.

The markets have become more and more fragmented and competitiveness has increased. Manufacturers are required to make products of better quality in the least amount of time and at the best possible price, to result in the highest degree of customer service/satisfaction. For fulfilling these requirements of both customers and manufacturers, it emerges a newer concept 'agile manufacturing'. Agile Manufacturing makes use of modern information technology to form effective enterprises. Within the new global market environment, customer requirements are not limited to traditional issues, such as higher quality, lower price, and so on, but extend to the speed of delivery and variability of products. Therefore, enterprises must be capable of delivering new products efficiently to the customer-driven market to remain competitive, that is, to maintain "agility".

Business organizations for their competitive advantage need to be linked internally across the business functions as well as externally with other firms. These organizations use logistics as a tool to effectively manage the materials and distribution system in the supply chain by establishing inter-firm linkages. The optimum utilization of products, materials, resource, and space can help reducing operating costs, improving service levels and reducing order cycle times. This can be made possible only by strategically managing the logistics operations. These logistics functions are supplier management, inventory management, distribution management, and warehouse management.

Information technology enabling the manufacturing or logistics systems, current trends, strategies, and the influence of consumer behavior reflect the emerging requirements of

business. In the current manufacturing system, customers are dictating the suppliers from design to delivery of the product as per their requirements and manufacturers have accepted this concept known as customized manufacturing. Earlier business organizations adopted this concept of customization for increasing efficiency, reducing operational costs, and downsizing. As downsizing has reached a point of diminishing returns, the emphasis is shifting from increasing efficiency to increasing revenue and profits.

To balance service expectations and return on assets is very critical for manufacturers and requires dynamic management skills. Accomplishing the goal of satisfying the changing needs of the customers may increase the cost, so manufacturers are under pressure how to deliver highly customized level of services to their customers and are manufacturing highly customized level of services to their customers and are maintaining a huge investment in assets. Manufacturers have to carry these assets in inventory and need efficient planning that can improve overall return on assets.

Manufacturing and logistics supply chain management software that link design, manufacturing, and distribution process through information systems can help to overcome the pressures of complexity in supply chain and enable managers to focus on the coordination and fulfillment of customer orders. Technology helps manufacturers in terms of demand management and order fulfillment by integrating all the phases from design to assembly of a product and involve activities such as planning and execution, and financial control which can be termed as supply chain management.

The computer software applications designed for various phases of the product life cycle from computer-aided design to computer-assisted production helps in improving efficiency and lowering the costs. Once a product is designed, these software applications for planning and executing production includes manufacturing resource planning systems, enterprise resource planning systems, manufacturing execution systems and control systems for automated equipment.

The challenge facing industry to make intranet more useful for manufacturing need to consider the importance of material resource planning systems, enterprise resource planning systems and cost account systems, the factory level coordinating and tracking systems, and the factory floor devices and process control systems. So resource planning, manufacturing execution, and distributed control are the three elements that need to be integrated through automation to face the challenge of future.

Intranet-based software solutions with innovative approach are covering all the current manufacturing issues and ready to serve the global marketplace maintaining competitive advantage. The standard design of these systems encompasses of three critical concepts i.e. customer-driven manufacturing, real-time decision support, and intelligent process management.

Logistics management and distribution management, the two terms that appear to be used synonymously have different meanings, are the processes that move goods through the supply chain. A good logistics management often determines the success of a business. It is concerned with the strategy and management of the movement and storage of materials and products from suppliers to retail outlets and customers through the distribution system of the organization. Logistics management attempts to achieve a balance between holding minimum stock while providing the best service possible to the customer.

## **12.9 KEYWORDS**

**PES:** Product Execution System, the software which correlates the data for control of manufacturing operations by tracking materials, equipment, personnel, specifications/work instructions and facility conditions of the manufacturing plant. Mps:

**MPS:** Master Production Scheduling

**MRP:** Material Requirement Planning (MRP)

**CAP:** Capacity Planning

**SFL:** Shop Floor Control

**QMS:** Quality Management System

**ERP:** Enterprise Resource Planning

**MES:** Manufacturing Execution Systems

**DRP:** Distribution Requirement Planning

### **12.10 SELF ASSESSMENT QUESTIONS**

1. What is the role of technology in manufacturing management?
2. Describe the major advantages of integrated logistics.
3. What is agile manufacturing? Discuss its capabilities.
4. Explain customer-driven manufacturing.
5. How the complexity of supply chain can be managed efficiently?
6. Explain in detail various types of manufacturing information systems.
7. Describe some of the problems with traditional logistics management system.
8. Discuss the main objectives of modern logistics management system.

### **12.11 SUGGESTED READINGS**

- Kalakota, Ravi and Whinston, Andrew B. “Electronic Commerce – A Manager’s Guide”, Pearson Education, Inc.
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# **LESSON: 13**

## **INTRANET AND CORPORATE FINANCE**

**Subject: E-COMMERCE**

**Paper Code: MM-409/IB-416**

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### **STRUCTURE**

- 13.1 Intranet and Corporate Finance – An Introduction
- 13.2 Financial Systems
- 13.3 Financial Intranet
- 13.4 Software Modules in Financial Information Systems
- 13.5 Human Resource Management Systems
- 13.6 Size/Structure of Financial Software Market
- 13.7 Summary
- 13.8 Keywords
- 13.9 Self Assessment Questions
- 13.10 Suggested Readings

### **13.0 OBJECTIVES**

The motive of this chapter is to present an introduction to intranets and corporate finance and within that framework the role of intranets in financial management, financial information management process, role of intranets in the area of human resource management, and web enabling OLAP are discussed.

After going through this lesson, you will be able to:

- Describe the role of intranet in financial management.
- Explain the software modules in financial information systems.
- Describe the role of intranets for transaction accounting, inventory accounting, payment management, and treasury and cash management.
- Discuss the human resource management information systems.
- Describe the structure of financial software market.

### **13.1 INTRANET AND CORPORATE FINANCE – AN INTRODUCTION**

Companies are focusing on how voluminous data about various supply-chain activities be transformed into useful information for their true competitiveness and profitability improvement. They have realized that the knowledge about customers, products, and suppliers, the availability of assets, and the status of commitments is essential for an organization to take accurate and timely decisions. However, despite maintaining sophisticated transaction systems that collect operational data, the information required for decision making and performance measurement purposes is not readily available to the managers.

The organizations have too much detailed data that needs to be analyzed to take smart decisions for developing a response to an emerging business situation. But the decisions are hampered by the inability to turn data into useful information. To enable large-scale data analysis, firms are increasingly using Online Analytical Processing (OLAP). Not only are the data analysis tools but accuracy, timeliness, and accessibility of the data equally important. Managers are facing pressure to make profitable decisions speedy and require access of distributed data ‘any time’ from ‘any where’.

Voluminous and worldwide data, changing corporate structures due to mergers and acquisitions, necessity of timely and reliable consolidations, budgets and forecasts are some of the reasons that find common tools of the traditional process such as general ledger systems and spreadsheets woefully inadequate and organizations are required to reengineer their financial management systems.

### **13.2 FINANCIAL SYSTEMS**

A financial system includes the business processes, procedures, controls, and data dedicated to the operation and maintenance of corporate financial objectives. It involves reporting and analyzing financial data, simplifying the budgeting and forecasting process, enabling better planning, controlling the financial consolidation of actual results, answering ad-hoc requests efficiently and improving cost control and performance measurement. Financial systems are often triggered by events having financial consequences such as the receipt of appropriations, acquisition of goods or

services, payments or collections, recognition of guarantees, benefits to be provided, or other potential liabilities; or other reportable financial activities.

In a technical manner, common database, common data element definitions, and standardized processing for similar types of transactions are the characteristics of a financial system. It involves multiple applications that are integrated through a common database to meet defined data and processing requirements.

### **Functionality of Financial Systems**

To be successful, the developers of financial systems software need to consider technical architecture as well a thorough understanding of the changing business requirements that are emerging in terms of business functionality must be given equal importance.

Accounting Systems: Accounting systems are used to prepare statements by recording and aggregating financial data of an organization. A formal procedure that helps an accountant identify the financial performance of an entity, and estimate the amount owing to it and by it, at the end of a defined period of time, is referred to as accounting system.

Accounting system is the set of manual and computerized procedures and controls that provide for identifying relevant transactions or events; preparing accurate source documents, entering data into the accounting records accurately, processing transactions accurately, updating master files properly, and generating accurate documents and reports. These reports provide relevant information about business units, transactions, and events for decision making on the financial position of the firm and the performance of various business units. Accounting can be classified into two categories:

**1. Financial Accounting:** This system collects, classifies, and reports financial transactions for the purpose of disclosure requirements to the external sources such as investors, creditors, financial analysts, and share holders of the organization. Financial accounting includes the following activities:



- Collecting, processing, maintaining, transmitting, and reporting data about financial events
- Support financial planning or budgeting activities
- Supporting the preparation of financial statements

**2. Management Accounting:** This system has evolved from simple cost accounting and is newer one as compared to financial accounting and generates reports that are used by organizations internally. Management accounting provides a financial analysis of management decisions and activities. It includes the following activities:

- Reporting historical transaction to internal and external parties
- Accumulating and reporting cost information
- Safeguarding the assets of a company
- Providing insight with respect to the value of future transactions

### **Corporate Performance Measurement Systems**

Business executives are dissatisfied with the traditional accounting systems in the fast changing environment because of their not providing relevant information. Though these systems can communicate a huge amount of financial data about past experiences with capital markets and regulators but not able to tell what levers companies needed to pull to create growth opportunities and future value.

Lack of predictive power and inability to track the value of intangible corporate assets such as business processes are also the problems of these systems cited by many of the critics. A large number of businesses worldwide are finding new performance measures to include in their traditional accounting-based performance criteria for customer satisfaction and company's financial soundness. These performance measures can be at three levels:

- (a) The individual business unit performance measures: Performance can be analyzed by knowing the appropriateness, use, cost and benefits of these measures.

- (b) The system level performance measure: System can be analyzed by exploring issues such as appropriate elements covered or not, measures relating to the long- term and short-term objectives and rate of improvement have been introduced or not, measures have been integrated or not and if any of the measure conflict with one another.
  
- (c) The relationship between the performance measurement system and the environment within which it operates: Systems can be analyzed by assessing strategies, organizational culture, and reward structure of organizations in respect of performance measures. Customer satisfaction and competition are also needed to be focused by these measures.

As the environment and economy change continually, the revision and review of the measurement system is needed at the same pace. The modern financial information systems provide the type of information that reduces uncertainty. The information taken from the transactions is converted into knowledge by information systems for making decisions regarding business processes by managers at different levels. Different information is needed at different levels and to operate an organization effectively and efficiently, it requires, relevant information be provided to the authorized employees at all levels. And this can be possible through the implementation of information technology, may be the intranets.

### **13.3 FINANCIAL INTRANET**

Accounting and finance departments deliver some of the most crucial data across an organization. An accounting intranet creates a centralized, open-standards platform for publishing that information and new interactive method for processing transactions with either internal departments and employees, or external partners. Examples of possible content and applications are:

- Accounts payable/receivable support
- Payroll
- Intranet commerce, requisitioning system
- Financial reports

- Policies and procedures
- Budgeting
- Asset management
- Expense reports
- Unit reporting and forecasting

Primarily, accounting software were used to enter the financial transactions and manage those transactions in the form of audit trail, but managers need a lot more information from accounting databases. Intranet helps solving this problem by integrating necessary activities (modules) to provide accounting information in the specific form where and when needed by managers. Authorization, security and user friendliness are the top priorities at many of the firms using web applications to disseminate corporate finance information at different levels of the managers through simple forms-based query capabilities which provide a number of views or reports of the financial statements rather than one general view as in traditional one. Integration through new systems technologies also provide facility to put information into a system once and communicating it at all the different places saving a lot of time of accountants doing manually this job.

In the era of mainframes, large financial systems were developed, but now these systems are inefficient, ineffective, troublesome, and very costly to maintain. The emerging new technologies are expected to be more beneficial and in demand.

### **Tackling Problems with Financial Intranet**

Financial information must be dynamic yet support archiving of historical performance data. Finance intranet has typically included payroll, revenue forecasts, budgets, profit and loss statements, sales reports, accounts payable and receivable, financial statements for specific business divisions and product lines, cost statements for cost centers, cash flow forecasting, exchange rates, tax rates and compliance information, and performance reporting data such as sales volumes and marginal profit by customer. All employees consume the information, but with roles-based permissions the security of confidential data is guaranteed. The finance intranet can

disseminate information rapidly to the entire organization and obviates the need for one-to-one support to management and employees.

The implementation of intranet can help tackling successfully four major problems that existing systems were not able to as given below:

**1. Production Control:** As the means of sourcing are widening, financial flows related to production are getting more and more complicated. In the earlier systems, the primary responsibility was to collect and present historical information about accounts payable, accounts receivable, fixed asset management, purchasing, and general ledger and managers were only able to handle routine transactions. Business activities were given very little consideration through these systems and so were not able to produce accurate product costs for pricing, sourcing, product mix, and responses to competition. An integration information process is required which may provide an accurate picture of financial positions to the financial analysts to take accurate strategic and operational decision on time.

**2. Daily operations that affect short-term and long-term strategy:** It requires operating information by line managers and performance information by senior management on a periodical basis. Many of the financial accounting systems provide batch reports that may be sufficient for the purposes of accountants but these systems lack in providing information of daily operations that could help managers to better understand the business before making short-term and long-term strategy. In the conventional systems, managers rely on historical information and previous business decisions but changing market conditions and specific business situations force financial analysts to consider the new financial systems based on technology.

**3. Cost control:** In this rapidly changing world, there is a growing need for quicker, more accurate, and more useful information that can perform better financial management so as to control the cost, and improve productivity and quality. Earlier in 1990s, downsizing and cost control were the means of survival for a business. Many of the large-scale decentralize companies were facing problem in handling information effectively. Adoption of a variety of different accounting methods and

inflexible legacy systems are the two important reasons that failed these companies to organize financial information strategically.

**4. Control over report generation:** With the automation, information systems are becoming more powerful and widespread. Integration of information systems through inexpensive intranets has increased the scope of computing from central to individual in the functional departments. The information is produced into long and voluminous reports because of the details computed through different methods and formats by each of the employee in the organization. These long reports are received ultimately at a central place due to the integration of information systems and contain a few earlier pages prepared for what information is actually required and rest of the report explains what they mean.

#### **13.4 SOFTWARE MODULES IN FINANCIAL INFORMATION SYSTEMS**

An information system comprised of one or more applications that is used for any of the following: collecting, processing, maintaining, transmitting, and reporting data about financial events; supporting financial planning or budgeting activities; accumulating and reporting cost information; or supporting the preparation of financial statements. Financial information systems include the following software modules:

- General Ledger
- Accounts Payable
- Accounts Receivable
- Asset Management, Costing, and Billing and Invoicing

However, transaction accounting, financial planning, financial analysis, inventory accounting, payment management and cash management are the critical areas of finance and accounting that need to be overviewed before discussing the application of electronic commerce on corporate finance.

#### **Transaction Accounting**

General ledger accounting, consolidation, accounts payable and accounts receivable, asset accounting, and special purpose ledger are the different elements that come under transaction accounting and some of the complexities of accounting world can be viewed through these elements.

**General Ledger (G/L):** General Ledger is the central application area of Financial Management where all financial information is posted, summarized, and reported or is a record to which monetary transactions are posted in the form of debits and credits from a journal. It is the final record from which financial statements are prepared. General ledger accounts are often control accounts that report totals of details included in subsidiary ledgers. The general ledger is the core of a company's financial records. These constitute the central “books” of the system, and every transaction flows through the general ledger. These records remain as a permanent track of the history of all financial transactions since day one of the life of the company.

It involves posting, summarizing, processing and reporting of all financial accounting transactions and provides financial information to the organizations timely. A complete audit trail of business transactions is also maintained through this module. Within the general ledger, organizations consolidate data from subsidiary company databases with both similar and different time periods and account structures for the purpose of comprehensive reporting. The provision of reading multiple data formats files into the parent company database is also given as standard functionality in this module. Following are its key benefits:

- Generate complete audit trails.
- Make reports using historical data.
- Show amounts in an alternative currency on financial reports such as value added tax (VAT) reports, annual reports, and income statements.
- Define an unlimited number of formats.
- Automate procedures to improve workflow.

**Accounts Payable:** The information relating to how much money the organization has to pay, due dates, and available discounts are taken care in accounts payable. It

records money which a company owes to vendors for products and services purchased on credit. This item appears on the company's balance sheet as a current liability, since the expectation is that the liability will be fulfilled in less than a year. When accounts payable are paid off, it represents a negative cash flow for the company. These information are automatically calculated in accounts payable systems being integrated with financial EDI modules. Analysts look at a company's relationship of accounts payable to purchases for indications of sound financial management.

**Accounts Receivable:** Money which is owed to a company by a customer for products and services provided on credit. Accounts receivable is one of a series of accounting transactions dealing with the billing of customers which owe money to a person, company or organization for goods and services that have been provided to the customer. This is treated as a current asset on a balance sheet. This is typically done in a one person organization by writing an invoice and mailing or delivering it to each customer.

Organizations need to record what customers have brought on credit from them, whether the credit limit has been exceeded or when due dates have been exceeded a specified time. The receivables in the form of statements are generated to provide up-to-date information to the customers about their accounts and to identify problems in advance on the part of business firms. In this module, customer order and shipping report are matched with supplier's accounts receivable.

### **Intranet and Transaction Accounting**

Intranet gives companies a boost for transaction accounting purposes in the following ways:

1. Reducing redundancy in transaction entry and making more efficient through electronic means.
2. Similar kinds of transactions are processed using common processes in a consistent manner.
3. Data entry, transaction processing, and reporting can be controlled internally throughout the system to ensure the validity of information and protection of financial resources.

4. An audit trail of all transactions transmitted through a network can be performed to provide a complete reliable history of record transmission to accountants.

The different accounting modules can be integrated with each other through intranet technology in order to save time and prevent errors caused due to the repetitive data entry.

### **Inventory Accounting**

Inventory Accounting is a comprehensive, step-by-step guide to setting up an inventory accounting system and keeping it running at maximum efficiency. This hands-on book provides accounting professionals with essential information on how to:

- Set up an accounting system that efficiently handles accumulating inventory costs, summarizing accounts, and standard journal entries used to record transactions
- Use best practices to increase the efficiency of inventory-tracking and costing functions
- Install unique controls to combat inventory fraud
- Implement a step-by-step checklist of activities for inventory counting procedures
- Adapt inventory tracking and costing systems to accommodate a variety of manufacturing systems

Spanning the entire spectrum of inventory accounting, Inventory Accounting deftly explores every facet of the field to help professionals eliminate inaccuracies from their inventory accounting systems. It involves keeping and controlling record of the items being assembled, stocked, and sold so as to provide operational reporting to the managers for the purpose of managing inventory. Inventory includes a number of functions:

1. Inventory kitting: Ordering the inventory items bundled into a single kit instead of ordering a long list of individual items can save a lot of processing



and warehouse time. Multilevel or subassembly kitting are considered as more sophisticated methods for inventory.

2. Inventory reporting: To schedule the production, to find the cost of goods sold, and to make decisions about ordering, organizations need to know necessary details about inventory levels such as quantities on hand, quantities of back order, and quantities on sales order. The up-to-date information even in the form of summary and detail analysis for planning and control of finished goods, work-in-progress, and raw material inventory can be obtained through intranets.

Inventory control manages stock levels and processes inventory receipts, shipments, returns and adjustments. Inventory control provides for effective inventory management by offering extensive screen inquiries and reporting functions that give detailed and current information about quantities, prices, item movements and sales history. Because Inventory control runs through a standard web browser, users can process all of their inventory transactions anywhere and anytime accessing the internet.

### **Payment Management**

In today's competitive environment, automatic purchase order creation, automatic tax withholding along the business process can help to improve operational efficiency by eliminating paperwork and redundant data entry. Tight integration of purchasing, payables and receivables may automatically result into strong management control along the business process. The suppliers and distributors are linked electronically in this process to receive and send payments. It results in saving a lot of time for computing invoices of the companies, reducing errors, and lowering transaction costs while increasing the number of invoices processed.

Financial electronic data interchange (EDI) is used in business-to-business payments to transmit information electronically about payment and remittance between payer and payee, and their respective banks thereby eliminating delays in processing and improving payment flows between bank accounts of payer and payee. Businesses using financial EDI make decision whether payment instruction and remittance data

will flow through the banking system or whether payment instructions flow through the banking system while remittance data are transmitted over a direct data communication link with a trading partner or over a value added network. Value added networks accept electronic data in a variety of formats and by converting the incoming data to a format usable by the receiver of the information. Value added networks also manage transmission schedules and hold data until receivers are ready to accept them.

### **Treasury and Cash Management**

Financial institutions need to support for multiple currencies, international tax methods, and other international business practices to boost global business organizations to deal in the global marketplace by enabling these organizations to manage their money in various foreign accounts. Thus treasury management includes multinational, multicurrency bank reconciliation, and cash management.

Treasury management generally refers to the set of policies, strategies and transactions that a company adopts and implements to raise finance at acceptable cost and risk, to manage its cash resources, and to reduce interest rate, foreign exchange and commodity price risks, as well as in the conduct of its relationships with its financial stakeholders (mainly banks). The provision to an enterprise of one or more of following function: provision of short and long term funds; management of cash and working capital; relationship with banks and other financial institutions; foreign currency risk management. Treasury management (or treasury operations) refers to a management of an enterprise' holdings in and trading in government and corporate bonds, currencies, financial futures, options and derivatives, payment systems and the associated financial risk management.

The management of the cash balances of an enterprise in such a fashion as to maximize the availability of cash not invested in fixed assets or inventories and also so as to avoid the risk of insolvency. There are three motives for holding cash; *the transactions motive*; *the precautionary motive*; and *the speculative motive*. The precautionary motive and the speculative motive are the most useful technique of cash management.

Large companies need prompt access to information relating to their checking accounts in order to make payments and reduce their exposure to check fraud. Cash management is especially crucial in retail operations where checks are used extensively. Check listings and bank reconciliation can be major problems and relatively simple backroom applications can help. The process of transferring information manually via phone service and faxes between the bank and its customers is generally costly and inefficient maintained by a back-office operational staff in the bank and can be improved through internet application. As rapid transfers of information between the bank and its customers is requisite for effective cash management.

### **13.5 HUMAN RESOURCE MANAGEMENT SYSTEMS**

Human Resource Management Systems (HRMS), Human Resource Information Systems (HRIS), HR Technology or also called HR modules, shape an intersection in between human resource management and information technology. A Human Resources Management System (HRMS) is a software application that combines many human resources functions, including benefits administration, payroll, recruiting and training, and performance analysis and review into one package.

Gone were the days when HR department in an organization was just meant for managing people by concentrating solely on paying workers, providing benefits, and tracking government regulations whereas compensation planning, and career monitoring were of least concern. In the business world with continuous legislative, operational and environmental changes, the complexities for HR department are increasing in the form of issues like mergers, acquisitions, and downsizing; pressures to increase productivity while controlling costs, demands from a culturally diverse workforce; and need to recruit, train, and maintain employees. Organizations must manage its workforce dynamically to maintain a competitive edge. Employees need to be well informed of important company issues in addition to all the financial details pertaining to their personal health and well being. Information within a department and across department line need to be integrated and according to organization's policy and procedures, employees should be allowed at all levels to update and manage information easily.

Intranet is an effective tool that can help HR departments to enable managers and employees to access information directly. It also provide a common platform to deliver solutions to support a wide range of HR functions, including recruiting and applicant tracking, organizational training development, skills planning and performance evaluation, employee self-help, compensation and benefits administration, and HR call support.

Human Resources (HR) is information intensive. HR intranet is used by the entire organization and may contain career planning tips and sites, the company handbook, benefits forms and programs, and training information. Some organizations have also included “lifestyle” sections on their HR intranet that incorporate advice on substance abuse, health prevention, parenting, caring for seniors, moving, and the like. The HR intranet delivers rapid, self-service information dissemination at low cost as well as legal compliance.

HR departments have been some of the most enthusiastic developers of intranet applications mainly because of the large amounts of paper-based processes that can be transitioned to the web. Examples of possible content and applications are:

- Employee handbook
- Telephone/E-mail directory
- Interactive benefits information
- 401K tracking
- Employee surveys
- Recruiting/job listings
- Candidate screening applications
- Organizational charts
- Newsletters
- New employee training
- Employee personalized home pages

### **Human Resource Management System Functions**

The objective of the HRMS module is to manage the recruitment of a workforce and track developments related to the employees of the organization. These may be assessed in the form of promotions, transfers, deputation, leave, etc. The module also provides reports on period-to-period details of the employee. HRMS aids in improving manpower planning and in the effective utilization of manpower across the organization. The functions of HRMS can be broadly stated as:

### **Organizational set up and configuration**

- Defining organizational structure and hierarchy
- Updating organizational structure and hierarchy
- Defining and maintaining employee classification and hierarchy
- Set up access and approval levels

### **Recruitment**

- Advertisements in various forms
- Application processing
- Written tests and group discussions
- Updated lists for campus recruitments

### **Employee details maintenance**

- Maintaining service records of employees

### **Employee benefits details maintenance**

- Tracking changes in salary scales and allowances
- Producing appropriate reports
- Verifying, registering and updating professional memberships
- Allowances and claims processing
- Issuing loans and advances

### **Attendance management**

- Tracking attendance registers
- Tracking late arrivals
- Tracking overtime

- Maintaining shift rosters
- Capturing interface data
- Generating interface reports

#### **Training details maintenance**

- Tracking budgetary allocations
- Tracking internal training programmes
- Maintaining details of training institutions
- Maintaining training requests and requirement details
- Maintaining post-training details
- Maintaining post-training work reallocations

#### **Allocations, transfers and deputation management**

- Allocations, transfers and deputation management
- Maintaining deputation details
- Generating transfer details

#### **Performance-appraisal management**

- Maintaining details of timely performance-appraisal reports
- Maintaining details of ratings from appraisal officers
- Generating details of reminders for performance-appraisal reports

#### **Promotion-details management**

- Generating lists of eligible candidates
- Grading eligible candidates
- Maintaining details of promotions

#### **Leave-details management**

- Crediting leave to employee accounts
- Maintaining details of leave availed and required approvals
- Maintaining details of leave encashment
- Validating details of residual leave

### **Separation-details management**

- Updating details of terminal benefits
- Registering details of employee benefits
- Generating reports of these details

### **Manpower planning**

- Maintaining transfer details
- Maintaining succession details
- Generating MIS reports
- Generating current human resources details

### **Human Resource Management System Software**

Human Resource Management System covers all aspects of employee administration.

The software typically includes:

- Human Resources: personnel, recruiting, salary administration, training/development, health and safety
- Payroll: time reporting, payroll calculations, and tax computation
- Benefit administration: the management of defined benefit, defined contribution, and 401K pension programs, flexible spending, account administration, and automated open enrollment
- Health care benefits management: medical, dental, and vision insurance

The human resource management system (HRMS) module aims to manage employee information by minimizing paperwork in the personnel department. Out of the four modules, benefit administration and health care benefits management are the two underdeveloped modules that have enormous potential for growth.

### **Benefits Administration**

Benefits administration is quite challenging in the current business environment. A wide range of plans such as health, short-term and long-term disability, savings, leaves, retirement, pension, vacation buy and sell etc. are packaged in the form of benefits for the employees by accessing data from their personnel and payroll records automatically from the databases within the organization through the networks. May

be the information related to employee leaves such as sick time, maternity leave or their tax contribution, can be examined and updated by them online.

Most of the organizations are shifting their existing HR policy or benefits from manual to the intranet so as to inform their employees online about all company HR policies. Employees by entering their personal details and company ID can conduct database lookups to seek information such as number of vacation days outstanding from their web browsers. Using IDs and passwords to ensure that only authorized personnel have access to the intranet, information can be added, updated, removed, queries, and calculated. It reduces the cost and the response time for the employee and HR department feel free from answering questions to the employees and basic processing tasks.

### **Health Care Benefits Management**

Organizations providing health care benefits have a desire to reduce cost of managing patient information from admissions to discharge, billing and collections as well as medical record management and thus require reengineering initiative for their processes. The web can make it possible through its digital procedures by delivering timely information on patients. Organizations are increasing their expenditures on health care benefits. The managed care trend is prevailing today as an alternative of traditional fee-for-service reimbursement. In case of managed care, the risk for the cost of care shifts away from the employer onto the provider. Organizations also require information for objective evaluation and analysis regarding the quality and cost of care in order to improve the system continuously to serve better the needs of their patients.

### **13.6 SIZE/STRUCTURE OF FINANCIAL SOFTWARE MARKET**

The changing business environment demands companies to integrate all its departments to flow financial data throughout the enterprise to meet management needs. Organizations currently using their aging financial processes have begun replacing with new client/server based financial products. However, client/server financials are in its infancy but have substantial opportunity. The new generation software need to support a variety of management activities such as leasing, asset management, budget preparation, portfolio management, cash flow and revenue



projections, purchasing, and other operational, analytical, and performance measurements.

Software developers are motivated to produce state-of-the-art products that encompass solution for all these management activities and integrate them to improve financial and accounting processes.

### **Product Strategy**

Systems integration and reengineering activities related to interfacing users are the two major concerns that need to be given special attention in the design effective strategy for the financial product. The design simply involves process automation to analyze the impact of multiple options and to facilitate decision making. System performance has its own importance in the product strategy that focus on the following aspects of the software applications:

- Number of transactions handled in a unit time
- Accessibility of data
- Flexibility of the system
- Ease of use

System performance measure is considered on priority in the software applications by the organizations such as retailers that process many small transactions. Organizations are approaching software developers to design systems that are easier to install and maintain. Customers are more satisfied with the new software systems that facilitate features like auto-installation of routines and software-assisted upgrades and help in reducing the consulting and support staff. Upgradation with next versions of software has also been made quite easier.

### **Financial Data Warehouse Management System**

Financial Data Warehouse Management System is a powerful, feature-rich solution for automating the finance-handling process which scales to accommodate the varied demands of small and mid-size organizations to highly complex, high-volume

environments. Data warehouses store tactical information about past events and used to answer the queries such as total revenue generated by an organization in a quarter.

The new emerging concept is of functional data warehouses to serve the specific needs of business by developing departmental warehouses. These departmental warehouses are easier to implement as compared to large all-in-one data warehouses and work as part of a complete end-to-end e-business solution by integrating radio-frequency (RF) and barcoding technologies with other modules. Some of the popular software applications for financial data warehouses include SAP, Oracle, Hyperion, and PeopleSoft. These financial software applications perform large-scale, network-based financial consolidation and reporting by collecting data from multiple general ledgers and planning systems to create an enterprise-wide information base.

### **OLAP: On-Line Analytical Processing**

OLAP is an acronym for On Line Analytical Processing and was created as a slight modification of the traditional database term OLTP (On Line Transaction Processing). It is an approach to quickly provide the answer to analytical queries that are dimensional in nature by transforming data stored in the warehouses into strategic information. The typical applications of OLAP are in business reporting for sales, marketing, management reporting, business performance management, budgeting and forecasting, financial reporting and similar areas. Specifically, finance departments use OLAP for applications such as budgeting, activity-based costing, financial performance analysis, and financial modeling. Some of the top commercial OLAP products are Microsoft, Hyperion, Cognos, Business Objects, MicroStrategy, SAP, Cartesis, Systems Union/MIS AG, Oracle, and Applix.

On-Line Analytical Processing is a category of software technology that enables analysts, managers and executives to gain insight into data through fast, consistent, interactive access to a wide variety of possible views of information that has been transformed from raw data to reflect the real dimensionality of the enterprise as understood by the user. Databases configured for OLAP employ a multidimensional data model, allowing for complex analytical and ad-hoc queries with a rapid execution time. OLAP provides better access and analysis, ranging from basic data navigation and browsing to multidimensional analysis of corporate data, complex

“what-if” calculations, time series trend analysis, and modeling, of the data contained in the database archives of financial data warehouses.

### **Functionality of OLAP**

OLAP takes a snapshot of a set of source data and restructures it into an OLAP cube. The queries can then be run against this. It has been claimed that for complex queries OLAP can produce an answer in around 0.1% of the time for the same query on OLTP relational data. OLAP functionality is characterized by dynamic multi-dimensional analysis of consolidated enterprise data supporting end user analytical and navigational activities including:

- calculations and modeling applied across dimensions, through hierarchies and/or across members
- trend analysis over sequential time periods
- slicing subsets for on-screen viewing
- drill-down to deeper levels of consolidation
- reach-through to underlying detail data
- rotation to new dimensional comparisons in the viewing area

OLAP is implemented in a multi-user client/server mode and offers consistently rapid response to queries, regardless of database size and complexity. OLAP helps the user synthesize enterprise information through comparative, personalized viewing, as well as through analysis of historical and projected data thereby giving the users an insight and understating needed for better decision making.

The fundamental difference between data warehouse and OLAP is that data warehouse is usually based on relational technology whereas OLAP uses a multidimensional view of aggregate data to provide quick access to strategic information for further analysis. Data warehouses have the ability to answer the queries about “who?” and “what?” and OLAP to answer “what-if?” and “why?” to take decisions about future actions.

### **Using Web for OLAP**

Web browsers are used as the front-end tool for performing query, analysis, and reporting against the data warehouse to enable financial analysts across different divisions of the company to view information consistently. Prior to this web enabled solution, finance managers were making analysis of the data stored in mainframe-based systems specific to various divisions. This created problems because sales and revenues were represented differently in each of the division of large firms making it difficult for executives to get an accurate view of their company's performance.

Web browsers are easy to use and provide simplified analysis of business data derived from a common data warehouse. It extends the ability to support large number of users and also help organizations by putting documentation on the web to greatly reduce costs associated with printing manuals and updates. Users do not require learning common codes, underlying database structures, and data access languages to conduct ad-hoc query, reporting and analysis. Virtually foolproof intuitive screens, featuring point-and-click and drag-and-drop paradigms, help users rapid summarizing of transaction data along a particular dimension from database restructured into multidimensional form.

### **Desirable Software Requirements**

Using the web, financial analysts require consistent and complete data records that must be meaningfully linked and cross-referenced for effective decisions making and delivering to a broad population of users. Some of the desirable features in a web-based decision support solution include:

1. HTML files be used to query and reporting as they are easily accessible via standard web browsers.
2. Reports and schedules should be posted on the web automatically.
3. Embedded hyperlinks enable users to download reports from its associated source documents for their analysis purposes.
4. User authorization provides secure access to underlying reports on the web.
5. Easy access of data from anywhere in the world for the cost of a local telephone call.
6. Easy manipulation process to move information around the enterprise.

7. Central database architecture to ensure secure, up-to-date, and consistent data across the enterprise.

### **13.7 SUMMARY**

The organizations have too much detailed data that needs to be analyzed to take smart decisions for developing a response to an emerging business situation. But the decisions are hampered by the inability to turn data into useful information. To enable large-scale data analysis, firms are increasingly using online analytical processing (OLAP). Not only are the data analysis tools but accuracy, timeliness, and accessibility of the data equally important. Voluminous and worldwide data, changing corporate structures due to mergers and acquisitions, necessity of timely and reliable consolidations, budgets and forecasts are some of the reasons that find common tools of the traditional process such as general ledger systems and spreadsheets woefully inadequate and organizations are required to reengineer their financial management systems.

Business executives are dissatisfied with the traditional accounting systems in the fast changing environment because of their not providing relevant information. Lack of predictive power and inability to track the value of intangible corporate assets such as business processes are also the problems of these systems cited by many of the critics. A large number of businesses worldwide are finding new performance measures to include in their traditional accounting-based performance criteria for customer satisfaction and company's financial soundness.

Primarily, accounting software were used to enter the financial transactions and manage those transactions in the form of audit trail, but managers need a lot more information from accounting databases. Intranet helps solving this problem by integrating necessary activities (modules) to provide accounting information in the specific form where and when needed by managers. Authorization, security and user friendliness are the top priorities at many of the firms using web applications to disseminate corporate finance information at different levels of the managers through simple forms-based query capabilities which provide a number of views or reports of the financial statements rather than one general view as in traditional one. Integration through new systems technologies also provide facility to put information into a

system once and communicating it at all the different places saving a lot of time of accountants doing manually this job.

In today's competitive environment, automatic purchase order creation, automatic tax withholding along the business process can help to improve operational efficiency by eliminating paperwork and redundant data entry. Tight integration of purchasing, payables and receivables may automatically result into strong management control along the business process. Financial EDI is used in business-to-business payments to transmit information electronically about payment and remittance between payer and payee, and their respective banks thereby eliminating delays in processing and improving payment flows between bank accounts of payer and payee. Businesses using financial EDI make decision whether payment instruction and remittance data will flow through the banking system or whether payment instructions flow through the banking system while remittance data are transmitted over a direct data communication link with a trading partner or over a value added network.

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### **13.8 KEYWORDS**

**WAREHOUSE:** Repository of data

**OLAP:** On Line Analytical Processing

**HRMS:** Human Resource Management System

**HRIS:** Human Resource Information System

**SAP, PEOPLESOFT:** Examples of ERP software

### **13.9 SELF ASSESSMENT QUESTIONS**

1. What is the role of intranet in financial management?
2. Give a brief note on accounting systems.
3. What do you understand by financial intranet? How do they help in tackling problems of financial systems?
4. Explain the role of intranet in transaction accounting.
5. How the complexity of HR departments can be managed efficiently through intranets?
6. Describe the structure of financial software market.
7. Discuss in detail on-line analytical processing.

### **13.10 SUGGESTED READINGS**

- Kalakota, Ravi and Whinston, Andrew B. “Electronic Commerce – A Manager’s Guide”, Pearson Education, Inc.
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# **LESSON: 14**

## **THE CORPORATE DIGITAL LIBRARY**

**Subject: E-Commerce**

**Paper Code: MM-409/IB-416**

**Author: Dr. Anil Khurana**

**Vetter :**

### **STRUCTURE**

- 14.0 Objective
- 14.1 Introduction
- 14.2 Definition
- 14.3 Benefits of digital libraries
- 14.4 Issues and challenges in digital libraries
- 14.5 Requirements of digital libraries
- 14.6 Cost of digital libraries
- 14.7 Types of digital documents
- 14.8 Corporate Data Warehouses
- 14.9 The Indian Scenario
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### **14.0 OBJECTIVE**

The idea of easy, finger-tip access to information-what we conceptualize as digital libraries today-began in 1945 and have continued to evolve with each advance in information technology. With the arrival of computers, the concept centered on large bibliographic databases, the now familiar online retrieval and public access systems that are part of any contemporary library. When computers were connected into large networks forming the Internet, the concept evolved again, and research turned to creating

libraries of digital information that could be accessed by anyone from anywhere in the world. Phrases like “virtual library”, “electronic library”, “library without walls” and, most recently, “digital library”, all have been used interchangeably to describe this broad concept.

After going through this lesson, you will be able to:

- Describe the concept of digital library
- Illustrate the benefits of digital library
- Identify the various issues and challenges involved in digital library
- Find out and justify the different requirements of digital library
- Highlight the various types of digital documents in digital library
- Explore the digital library scenario in India

#### **14.1 INTRODUCTION**

When thousands of people read any government report on the Internet, they retrieved the document from a major repository of government publications. Millions of such documents are now available through the world wide web which is ubiquitous as well as accessible anywhere/anytime. Is retrieving that report or other similar publications from the web equivalent to using a digital library? There is no broad, balanced collection of information that meets particular selection criteria. Internet publications lack standardization and validation. Items have minimal cataloging or other bibliographic control. And, finally, effective retrieval of information is not guaranteed. According to Clifford Lynch:

*One sometimes hears the Internet characterized as the world’s library for the digital age. This description does not stand up under even casual examination. The Internet and particularly its collection of multimedia resources known as the www was not designed to support the organized publication and retrieval of information as libraries are. It has evolved into what might be thought of as a chaotic repository for*

*the collective output of the world's digital "printing presses"... ...in short, the Net is not a digital library.*

### ***The "just-in-time" library***

Imagine a perfect library situated somewhere out in cyberspace. The library is equipped with precise, replicable discovery tools and materials on every subject from all perspectives in a full range of formats. Users can connect to these library resources in many ways: from a catalog, index, abstract, or finding aid which link to full text, digital images, or other facsimile editions, or to metadata descriptions of textual or multimedia holdings from a local library whose resources can be delivered to users either onsite or by mail. Older titles are archived and preserved, available on demand. Help is offered in real time, 24 hours a day, seven days a week. In essence, this virtual digital library can be used anytime, anyplace, and by anyone.

What we have imagined is a "just in time" rather than a "just in case" library. We have migrated from a state of scarcity to a state of abundance, transcending our geographic, legal and political boundaries, with librarians serving as knowledge navigators and learning facilitators. Our dream is for the emergence of a shared cyber library in which each of our individual institutions maintains its separate, unique identity, but offers direct, unlimited access to a rich collection of resources that are no longer limited by location, format, cost, time of day, or onsite restrictions.

## **14.2 DEFINITION**

So what is a digital library? There is much confusion surrounding this phrase, stemming from three factors. First, the library community has used several different phrases over the years to denote this concept-electronic library, virtual library, library without walls-and it never was quite clear what each of these different phrases meant. "Digital library" is simply the most current and most widely accepted term and is now used almost exclusively at conferences, online, and in the literature.

Another factor adding to the confusion is that digital libraries are at the focal point of many different areas of research, and what constitutes a digital library differs depending upon the research community that is describing it. For example:

- from an information retrieval point of view, it is a large database
- for people who work on hypertext technology, it is one particular application of hypertext methods
- for those working in wide-area information delivery, it is an application of the Web
- and for library science, it is another step in the continuing automation of libraries that began over 25 years ago

In fact, a digital library is all of these things. These different research approaches will all add to the development of digital libraries.

Third, confusion arises from the fact that there are many things on the Internet that people are calling “digital libraries,” which-from a librarian’s point of view-are not. For example:

- for computer scientists and software developers, collections of computer algorithms or software programs are digital libraries.
- for database vendors or commercial document suppliers, their databases and electronic document delivery services are digital libraries.
- for large corporations, a digital library is the document management systems that control their business documents in electronic form.
- for a publisher, it may be an online version of a catalogue.
- and for at least one very large software company, a digital library is the collection of whatever it can buy the rights to, and then charge people for using.

A fairly spectacular example of what many people consider to be a digital library today is the World Wide Web. The Web is a gathering of thousands and thousands of documents. Many would call this huge collection a digital library because they can find information,

just as they can do banking in a “digital bank” or buy compact discs in a “digital record store.” Yet, is the Web a digital library?

Thus, in examining the various examples of what are called digital libraries, it appears that librarians have been confused about what a digital library is, that the word “library” has been appropriated by many different groups to describe either their areas of research or signify a simple collection of digital objects.

So what is a working definition of “digital library” that makes sense? As a starting point, we should assume that digital libraries are libraries with the same purposes, functions, and goals as traditional libraries-collection development and management, subject analysis, index creation, provision of access, reference work, and preservation. A narrow focus on digital formats alone hides the extensive behind-the-scenes work that libraries do to develop and organize collections and to help users find information.

The institutions involved in the American Digital Library Federation came up with a similar notion of “digital library.” It also emphasizes the traditional underpinnings of libraries-selection, access, and preservation-as well as the fact that digital libraries will necessarily be constructed to serve particular communities.

*Digital libraries are organizations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collections of digital works so that they are readily and economically available for use by a defined community or set of communities.*

- digital libraries will also include digital materials that exist outside the physical and administrative bounds of any one digital library
- digital libraries will include all the processes and services that are the backbone and nervous system of libraries. However, such traditional processes, though forming the basis digital library work, will have to be revised and enhanced to

accommodate the differences between new digital media and traditional fixed media.

- digital libraries ideally provide a coherent view of all of the information contained within a library, no matter its form or format
- digital libraries will serve particular communities or constituencies, as traditional libraries do now, though those communities may be widely dispersed throughout the network.
- digital libraries will require both the skills of librarians and well as those of computer scientists to be viable.

Many corporations are finding that the most effective way to manage their business information is through a corporate library that provides the architecture to model, map, integrate, condense, and transform scattered information housed in digital documents and legacy databases into meaningful business information.

Today, the term digital library is widely used as the generic term for diverse information structures that provide organizations and workers access to the vast amount of internal information encoded in multimedia formats. It creates a unified repository of consistent business data for information processing. Companies can perform more substantive, accurate, and consistent analyses using the digital library as a foundation for decision support systems.

The digital library is not a monolithic entity but a loose collection of distributed on-line information sources-databases and electronic documents organized in a meaningful way. The term library is apt in this context because the fundamental mission of any library is to provide storage and physical access to the published document.

Digital libraries are of two types: electronic document-based digital libraries and structured data or database-oriented warehouses.

### ***Document Digital Libraries***

In the last four years, document processing and management has emerged from obscurity to challenge traditional notions of business data processing. We use the term document in the broadest sense, to denote all non data records, including books, reports, paper materials, electronic files, video, and audio.

The revolution of digital documents has been spurred by the availability of inexpensive networking technology and applications. It is also quite clear that new information generated outside of the relational database realm is done in digital document forms (word processing, spreadsheets, CD-ROMs, audio recordings, digital video, and others) and the rate of retrospective conversion (from paper to electronic form) is also growing.

From an electronic commerce perspective, a document digital library is simply a distributed network of interlinked information that is tailored for electronic publishing. It encompasses new types of information resources; new approaches to acquisition (especially with more sharing and subscription services); new methods of storage and preservation; new approaches to classification and cataloging; new modes of interaction with information; and shifts in organizational practices.

### ***Data Warehouses***

Data warehouses are designed as central information repositories for combining and storing vast amounts of historical and reference data from a number of different sources. These corporate data sources include mainframe databases, client-server relational databases, spreadsheets, text reports, flat files, and proprietary systems.

A data warehouse, simply stated, is a physical separation of an organization's operational data systems from its decision support systems. It includes a repository of information that is built using data from the far-flung and often departmentally isolated systems.

Building a data warehouse allows companies to optimize query times and enables managers to be consistent in their analysis.

Clearly, the approaches to developing and manipulating document libraries versus data warehouses are substantially different. The difference exists at the underlying content level and at the actual application level. Although the digital library promises to make it easy to conduct .electronic commerce, building the digital library itself is a challenging undertaking. That challenge can be broken down into three areas:

1. A need for a data model that provides an organization or schema
2. A strategy for populating that model with data
3. A way for users to get useful information out of the digital library

### **14.3 BENEFITS OF DIGITAL LIBRARIES**

The fundamental reason for building digital libraries is a belief that they will provide better delivery of information than was possible in the past. Traditional libraries are a fundamental part of society, but they are not perfect. Can we do better?

Enthusiasts for digital libraries point out that computers and networks have already changed the ways in which people communicate with each other. In some disciplines, they argue, a professional or scholar is better served by sitting at a personal computer connected to a communications network than by making a visit to a library. Information that was previously available only to the professional is now directly available to all. From a personal computer, the user is able to consult materials that are stored on computers around the world. Conversely, all but the most diehard enthusiasts recognize that printed documents are so much part of civilization that their dominant role cannot change except gradually. While some important uses of printing may be replaced by electronic information, not everybody considers a large-scale movement to electronic information desirable, even if it is technically, economically, and legally feasible.

Here are some of the potential benefits of digital libraries.

- **The digital library brings the library to the user**



To use a library requires access. Traditional methods require that the user goes to the library. In a university, the walk to a library takes a few minutes, but not many people are member of universities or have a nearby library. Many engineers or physicians carry out their work with depressingly poor access to the latest information.

A digital library brings the information to the user's desk, either at work or at home, making it easier to use and hence increasing its usage. With a digital library on the desk top, a user need never visit a library building. The library is wherever there is a personal computer and a network connection.

- **Computer power is used for searching and browsing**

Computing power can be used to find information. Paper documents are convenient to read, but finding information that is stored on paper can be difficult. Despite the myriad of secondary tools and the skill of reference librarians, using a large library can be a tough challenge. A claim that used to be made for traditional libraries is that they stimulate serendipity, because readers stumble across unexpected items of value. The truth is that libraries are full of useful materials that readers discover only by accident.

In most aspects, computer systems are already better than manual methods for finding information. They are not as good as everybody would like, but they are good and improving steadily. Computers are particularly useful for reference work that involves repeated leaps from one source of information to another.

- **Information can be shared**

Libraries and archives contain much information that is unique. Placing digital information on a network makes it available to everybody. Many digital libraries or electronic publications are maintained at a single central site, perhaps with a few duplicate copies strategically placed around the world. This is a vast improvement over expensive physical duplication of little used material, or the

inconvenience of unique material that is inaccessible without traveling to the location where it is stored.

- **Information is easier to keep current**

Much important information needs to be brought up to date continually. Printed materials are awkward to update, since the entire document must be reprinted; all copies of the old version must be tracked down and replaced. Keeping information current is much less of a problem when the definitive version is in digital format and stored on a central computer.

Many libraries provide online the text of reference works, such as directories or encyclopedias. Whenever revisions are received from the publisher, they are installed on the library's computer. The new versions are available immediately. The Library of Congress has an online collection, called Thomas, that contains the latest drafts of all legislation currently before the U.S. Congress; it changes continually.

- **The information is always available**

The doors of the digital library never close; a recent study at a British university found that about half the usage of a library's digital collections was at hours when the library buildings were closed. Materials are never checked out to other readers, miss-shelved or stolen; they are never in an off-campus warehouse. The scope of the collections expands beyond the walls of the library. Private papers in an office or the collections of a library on the other side of the world are as easy to use as materials in the local library.

Digital libraries are not perfect. Computer systems can fail and networks may be slow or unreliable, but, compared with a traditional library, information is much more likely to be available when and where the user wants it.

- **New forms of information become possible**

Most of what is stored in a conventional library is printed on paper, yet print is not always the best way to record and disseminate information. A database may be the best way to store census data, so that it can be analyzed by computer; satellite data can be rendered in many different ways; a mathematics library can store mathematical expressions, not as ink marks on paper but as computer symbols to be manipulated by programs such as Mathematica or Maple.

Even when the formats are similar, materials that are created explicitly for the digital world are not the same as materials originally designed for paper or other media. Words that are spoken have a different impact from words that are written, and online textual materials are subtly different from either the spoken or printed word. Good authors use words differently when they write for different media and users find new ways to use the information. Materials created for the digital world can have a vitality that is lacking in material that has been mechanically converted to digital formats, just as a feature film never looks quite right when shown on television.

Each of the benefits described above can be seen in existing digital libraries. There is another group of potential benefits, which have not yet been demonstrated, but hold tantalizing prospects. The hope is that digital libraries will develop from static repositories of immutable objects to provide a wide range of services that allow collaboration and exchange of ideas. The technology of digital libraries is closely related to the technology used in fields such as electronic mail and teleconferencing, which have historically had little relationship to libraries. The potential for convergence between these fields is exciting.

#### **14.4 ISSUES AND CHALLENGES IN DIGITAL LIBRARIES**

The highest priority of a library, digital or any other is to serve the research needs of clientele. The development, maintenance and extension of its collection and its technologies must be supportive as well as subordinate to his primary objective. However, in digital library environment:

- Functions of authors, publishers, vendors, and users, etc. will vary. Both

information professional and user will do the work of collection, storage, dissemination and organizational work. The user's work is however called as personal file collection. Anyone who has access to computer in a network can easily become a publisher. An author merely by posting messages to an online discussion group, she/he becomes a publisher. In such environment, information appears in one day and can be altered or disappear in the next day. In this situation, how to give a citation? How to collect a copy of the required information? How to organize the information? These are the debatable questions?

- Only digital information is disseminated; some are produced locally~ and most information is obtained by remote access; most of these information are less permanent in nature. In these circumstances, it is very difficult for the professional to decide: What should be organized? Who should do it? What standards to be followed?
- Users only locate the information; information is not usually structured, no rules or codes are followed and no one to control the information that is made available.
- The data or information will be of different type. To organize these data or information, we require cataloguing practice and it calls for an appropriate data model for organizing data with standard format. The tools like Gopher, Mosaic, etc. help in cataloguing, searching and retrieval of information from these digital libraries.
- Specialized technologies are needed for compressing as well as for organization or information. Database management methods whether extended relational or object oriented, not only are needed to support direct use of data collection in digital library, but also will help to handle catalogues, royalty administration, security control and other services. Text analysis and information retrieval techniques are crucial for converting, indexing, representing, searching and presenting desired information.

The optimism and hype from the early 1990's has been replaced by a realization that building digital libraries will be a difficult, expensive, and long-term effort. Creating effective digital libraries poses serious challenges. The integration of digital media into traditional collections will not be straightforward, like previous new media (e.g., video and audio tapes), because of the unique nature of digital information--it is less fixed, easily copied, and remotely accessible by multiple users simultaneously. Some the more serious issues facing the development of digital libraries are outlined below.

### **Technical architecture**

The first issue is that of the technical architecture that underlies any digital library system. Libraries will need to enhance and upgrade current technical architectures to accommodate digital materials. The architecture will include components such as:

- high-speed local networks and fast connections to the Internet
- relational databases that support a variety of digital formats
- full text search engines to index and provide access to resources
- a variety of servers, such as Web servers and FTP servers
- electronic document management functions that will aid in the overall management of digital resources

One important thing to point out about technical architectures for digital libraries is that they won't be monolithic systems. Instead, there will be a collection of disparate systems and resources connected through a network, and integrated within one interface, most likely a Web interface or one of its descendants. For example, the resources supported by the architecture could include:

- bibliographic databases that point to both paper and digital materials
- indexes and finding tools
- collections of pointers to Internet resources
- directories
- primary materials in various digital formats

- photographs
- numerical data sets
- and electronic journals

Though these resources may reside on different systems and in different databases, they would *appear* as though there were one single system to the users of a particular community.

Within a coordinated digital library scheme, some common standards will be needed to allow digital libraries to interoperate and share resources. The problem, however, is that across multiple digital libraries, there is a wide diversity of different data structures, search engines, interfaces, controlled vocabularies, document formats, and so on. Because of this diversity, federating all digital libraries nationally or internationally would be an impossible effort. Thus, the first task would be to find sound reasons for federating particular digital libraries into one system. Narrowing the field in such a manner would reduce the technical and political hurdles required to establish common practices. Further, because of the often uncertain futures of both *de jure* and *de facto* standards over time, what those standards are is unclear.

### **Building digital collections**

One of the largest issues in creating digital libraries will be the building of digital collections. Obviously, for any digital library to be viable, it must eventually have a digital collection with the critical mass to make it truly useful. There are essentially three methods of building digital collections:

- **digitization**, converting paper and other media in existing collections to digital form (discussed in more detail below).
- **acquisition of original digital works** created by publishers and scholars. Example items would be electronic books, journals, and datasets.
- **access to external materials** not held in-house by providing pointers to Web sites, other library collections, or publishers' servers.

While the third method may not exactly constitute part of a local collection, it is still a method of increasing the materials available to local users. One of main issues here is the degree to which libraries will digitize existing materials and acquire original digital works, as opposed to simply pointing to them externally. This a reprise of the old access versus ownership issue--but in the digital realm--with many of the same concerns such as:

- local control of collections
- long-term access and preservation

What about digital collection building in a coordinated scheme? There are many reasons why building digital collections is a good candidate for coordinated activity. First, acquiring digital works and doing in-house digitization are expensive, especially to undertake alone. By working together, institutions with common goals can gain greater efficiencies and reduce the overall costs involved in these activities, as was the case with retrospective conversion of bibliographic records. Second, it also reduces the redundancy and waste of acquiring or converting materials more than once. Third, coordinated digital collection building enhances resource sharing and increases the richness of collections to which users have access.

How can specific materials to be processed by a given institution be identified? Who collects and/or digitizes what materials could be based on factors such as:

- **collection strengths.** A particular library with a strong collection focus could be responsible for digitizing selected portions of it and adding new digital works to it.
- **unique collections.** If a library has the only copies of something, they are obviously the ones to digitize it
- **the priorities of user communities.** Such priorities will justify holding the materials locally, for example, because of the demands of a curriculum

- **manageable portions of collections.** When there is no other overriding criteria, then material can be divided up among institutions simply according to what is reasonable for any one institution to collect or digitize
- **technical architecture.** The state of a library's technical architecture will also be factor in selecting who digitizes what. A library must have a technical architecture up to the task of support a particular digital collection.
- **skills of staff.** Institutions whose staff don't have the necessary skills can't become a major node in a national scheme.

Yet, no matter how a collection is built--of materials digitized in-house, of original digital works, or of providing access to materials by pointing to other external resources--libraries in a collective must ensure it is preserved and made available in perpetuity. For example, if the only copies of digital works reside on a particular publisher's server, then what happens if the publisher goes bankrupt? Or if the market value of a particular work approaches zero? What if all of part of a digital collection of a library were lost, such as through some catastrophic event?

## **Digitization**

Recall that one of the primary methods of digital collection building is digitization. What does this term mean exactly? Simply put, it is the conversion of any fixed or analogue media--such as books, journal articles, photos, paintings, microforms--into electronic form through scanning, sampling, or in fact even re-keying. An obvious obstacle to digitization is that it is very expensive. One estimate from the University of Michigan at Ann Arbor, the organization responsible for the JSTOR project, puts the cost of digitizing a single page at \$2 to \$6 dollars US.

How do you go about deciding what parts of a collection to digitize? There are several approaches available, at least theoretically:

- **retrospective conversion of collections**--essentially, starting at A and ending up a Z. However ideal such complete conversion would be, it is impractical or



impossible technically, legally, and economically. This approach can arguably be dispensed with as a pipe dream.

- **digitization of a particular special collection or a portion of one.** A small collection of manageable size, and which is highly valued, is a prime candidate.
- **highlight a diverse collection** by digitizing particularly good examples of some collection strength
- **high-use materials**, making those materials that are in most demand more accessible.
- **ad hoc approach**, where one digitizes and stores materials as they are requested. This is, however, a haphazard method of digital collection building.

These approaches can be used alone or in combination depending upon a particular institution's goals for digitization. Nested within these approaches are several criteria for selecting individual items. These include:

- their potential for long-term use
- their intellectual or cultural value
- whether they provide greater access than possible with original materials (e.g., fragile, rare materials)
- and whether copyright restrictions or licensing will permit conversion.

## **Metadata**

Metadata is another issue central to the development of digital libraries. Metadata is the data that describes the content and attributes of any particular item in a digital library. It is a concept familiar to librarians because it is one of the primary things that librarians do--they create cataloguing records that describe documents. Metadata is important in digital libraries because it is the key to resource discovery and use of any document. Anyone who has used Alta Vista, Excite, or any of the other search engines on the Internet knows that simple full-text searches don't scale in a large network. One can get thousands of hits, but most of them will be irrelevant. While there are formal library standards for metadata, namely AACR, such records are very time-consuming to create

and require specially trained personnel. Human cataloguing, though superior, is just too labour extensive for the already large and rapidly expanding information environment. Thus, simpler schemes for metadata are being proposed as solutions.

The lack of common metadata standards-ideally, defined for use in some specified context-is yet another a barrier to information access and use in a digital library, or in a coordinated digital library scheme.

### **Naming, identifiers, and persistence**

The fifth issue is related to metadata. It is the problem of *naming* in a digital library. Names are strings that uniquely identify digital objects and are part of any document's metadata. Names are as important in a digital library as an ISBN number is in a traditional library. They are needed to uniquely identify digital objects for purposes such as:

- citations
- information retrieval
- to make links among objects
- and for the purposes of managing copyright

Any system of naming that is developed must be permanent, lasting indefinitely. This means, among other things, that the name can't be bound up with a specific location. The unique name and its location must be separate. This is very much unlike URLs, the current method for identifying objects on the Internet. URL's confound in one string several items that should be separate. They include the method by which a document is accessed (e.g., HTTP), a machine name and document path (its location), and a document file name which may or may not be unique (e.g., how many index.html files do you have on your Web site?). URLs are very bad names because whenever a file is moved, the document is often lost entirely.

A global scheme of unique identifiers is required; one that has persistence beyond the life of the originating organization and that is not tied to specific locations or processes.

These names must remain valid whenever documents are moved from one location to another, or are migrated from one storage medium to another.

The issue of persistent naming raises its head in a coordinated scheme, as well. Persistent name is an organizational problem, rather than an engineering problem. Technically, a system to handle name is possible, however, unique identifiers will only persist if some institution takes responsibility for their management and migration from a current technology to succeeding generations of technologies. Thus, one goal of a coordinated digital library scheme would be to identify an institution or institutions that would take charge of issuing, resolving, and migrating a system of unique names.

### **Copyright / rights management**

Copyright has been called the “single most vexing barrier to digital library development”. The current paper-based concept of copyright breaks down in the digital environment because the control of copies is lost. Digital objects are less fixed, easily copied, and remotely accessible by multiple users simultaneously. The problem for libraries is that, unlike private businesses or publishers that own their information, libraries are, for the most part, simply caretakers of information--they don't own the copyright of the material they hold. It is unlikely that libraries will ever be able to freely digitize and provide access to the copyrighted materials in their collections. Instead, they will have to develop mechanisms for managing copyright, mechanisms that allow them to provide information without violating copyright, called rights management.

Some rights management functions could include, for example:

- usage tracking
- identifying and authenticating users
- providing the copyright status of each digital object, and the restrictions on its use or the fees associated with it
- handling transactions with users by allowing only so many copies to be accessed, or by charging them for a copy, or by passing the request on to a publisher

## Preservation

Another important issue is preservation-keeping digital information available in perpetuity. In the preservation of digital materials, the real issue is technical obsolescence. Technical obsolescence in the digital age is like the deterioration of paper in the paper age. Libraries in the pre-digital era had to worry about climate control and the de-acidification of books, but the preservation of digital information will mean constantly coming up with new technical solutions.

When considering digital materials, there are three types of “preservation” one can refer to:

- **the preservation of the storage medium.** Tapes, hard drives, and floppy discs have a very short life span when considered in terms of obsolescence. The data on them can be refreshed, keeping the bits valid, but refreshing is only effective as long as the media are still current. The media used to store digital materials become obsolete in anywhere from two to five years before they are replaced by better technology. Over the long term, materials stored on older media could be lost because there will no longer have the hardware or software to read them. Thus, libraries will have to keep moving digital information from storage medium to storage medium.
- **the preservation of access to content.** This form of preservation involves preserving access to the *content* of documents, regardless of their format. While files can be moved from one physical storage medium to another, what happens when the formats (e.g., Adobe Acrobat PDF) containing the information become obsolete? This is a problem perhaps bigger than that of obsolete storage technologies. One solution is to do data migration--that is, translate data from one format to another preserving the ability of users to retrieve and display the information content. However, there are difficulties here too--data migration is costly, there are as yet no standards for data migration, and distortion or information loss is inevitably introduced every time data is migrated from format to format.

- The bottom line is that no one really knows how yet how to best migrate digital information. Even if there were adequate technology available today, information will have to be migrated from format to format over many generations, passing a huge and costly responsibility to those who come after.
- **the preservation of fixed-media materials through digital technology.** This slant on the issue involves the use of digital technology as a replacement for current preservation media, such as microforms. Again, there are, as yet, no common standards for the use of digital media as a preservation medium and it is unclear whether digital media are as yet up to the task of long-term preservation. Digital preservation standards will be required to consistently store and share materials preserved digitally.

What can libraries jointly do in a coordinated scheme? They can:

- create policies for long-term preservation
- ensure that redundant permanent copies are stored at designated institutions
- help establish preservation standards to consistently store and share materials preserved digitally

#### **14.5 REQUIREMENTS OF DIGITAL LIBRARIES**

Digital library requires well-tested and proven information technologies including the multimedia kit. Much of the work in digital libraries is achieved through e-mail service, by participating in usernet(s), by accessing the databases or servers through networks, like Internet. Locally developed databases will contribute a lot to develop digital libraries. In other words, the components of digital libraries are;

- Local library system, with adequate PCs having LAN, local databases in machine readable form, CD-ROMs etc, provision to provide e-mail service, access to servers, and to remote databases etc.
- Networks, including the network of networks.
- A variety of system functions to coordinate, manage the entry and to retrieve data.
- Well-trained man power.

## **14.6 COST OF DIGITAL LIBRARY**

The final potential benefit of digital libraries is cost. This is a topic about which there has been a notable lack of hard data, but some of the underlying facts are clear.

Conventional libraries are expensive. They occupy expensive buildings on prime sites. Big libraries employ hundreds of people - well-educated, though poorly paid. Libraries never have enough money to acquire and process all the materials they desire. Publishing is also expensive. Converting to electronic publishing adds new expenses. In order to recover the costs of developing new products, publishers sometimes even charge more for a digital version than the printed equivalent.

Today's digital libraries are also expensive, initially more expensive. However, digital libraries are made from components that are declining rapidly in price. As the cost of the underlying technology continues to fall, digital libraries become steadily less expensive. In particular, the costs of distribution and storage of digital information declines. The reduction in cost will not be uniform. Some things are already cheaper by computer than by traditional methods. Other costs will not decline at the same rate or may even increase. Overall, however, there is a great opportunity to lower the costs of publishing and libraries.

Lower long-term costs are not necessarily good news for existing libraries and publishers. In the short term, the pressure to support traditional media alongside new digital collections is a heavy burden on budgets. Because people and organizations appreciate the benefits of online access and online publishing, they are prepared to spend an increasing amount of their money on computing, networks, and digital information. Most of this money, however, is going not to traditional libraries, but to new areas: computers and networks, Web sites and Webmasters.

Publishers face difficulties because the normal pricing model of selling individual items does not fit the cost structure of electronic publishing. Much of the cost of conventional publishing is in the production and distribution of individual copies of books,

photographs, video tapes, or other artifacts. Digital information is different. The fixed cost of creating the information and mounting it on a computer may be substantial, but the cost of using it is almost zero. Because the marginal cost is negligible, much of the information on the networks has been made openly available, with no access restrictions. Not everything on the world's networks is freely available, but a great deal is open to everybody, undermining revenue for the publishers.

## **14.7 TYPES OF DIGITAL DOCUMENTS**

The emerging spectrum of documents types range from the inflexible (imaging formats) to the most flexible or customizable (virtual documents).

In the first part of the document continuum, content is treated as a monolithic whole. Not until the second part does the structure of content become more important. In the third part, content is not assumed to be in one place but distributed on the network. And finally, as documents become more flexible they need to become smarter. They have to provide a framework for managing all the different pieces-data and applications-that are present. These smart documents are known generically as active documents or document-oriented computing.

### ***Document Imaging***

Document imaging emulates microfiche and microfilm. An imaging system passes a paper document through a scanner that renders it digital and then stores the digital data as a bit-mapped image of the document. Keywords for each document that help in indexing and retrieval are entered during scanning. The problem with the imaging approach is that the output contains only images, not encoded text. Consequently, searching the text of a document's image is possible only using the keywords that categorize that document. And without a specific, well-designed list of keywords, a large library of imaged documents would be created but not used effectively.

This class of documents is characterized by little or no formal "internal" structure and provides limited freedom to use documents in a non sequential manner. But imaging

systems have their place. Insurance companies and other large firms often use imaging systems for processing high volumes of routine yet critical documents such as claims forms and supplier invoices. The benefit of being able to retrieve paperwork instantly instead of in days is obvious-time is money.

The following imaging standards are prominently used:

1. TIFF (tag image file format). Format for interchange of bit-mapped images. It was developed through an industry effort initiated by Aldus Corporation and has achieved de facto standard status.
2. ITU- TSS (International Telecommunication Union-telecommunications standardization sector) Group IV T.6 Facsimile. This standard is used for compression and exchange of bit-mapped files.

### ***Structured Documents***

A significant breakthrough in document management occurred when people realized that the document structure provides a clear description of document content. This important advance in electronic document manipulation goes by the name of structured documents. Structured documents apply data- base structuring capabilities to individual documents and document collections to allow tools to manipulate document content just like fields within database tables.

Structured documents provide the following capabilities:

1. Document formatting and rendering suits different information delivery vehicles or media. For example, companies are beginning to give their customers CDs containing electronic manuals in addition to providing hardcopy materials for those who prefer the more traditional. The reasons for this trend include reduced printing and packaging costs and faster updates of critical information.



Document rendering and presentation affects how users interact with onscreen help, educational materials, and documentation. For example, the audio rendering of documents opens up a new world for the visually handicapped.

2. The ability to create easily modifiable structures allows more dynamic documents and user interaction and manipulation, such as the ability to create bookmarks, highlight text, and write notes.

In other words, documents are no longer stagnant, but can be edited, cross-referenced, and linked to other items, such as graphics, video, photo, or voice scripts. These features bring the document to a multi-user, networked platform with the ability to collaborate with other users on the document.

3. Given the right structure and interface, electronic documents can be easier to search and query than its hardcopy counterpart or image counterpart. Multiple-word (Boolean) and string searches are often used to locate and retrieve the information, either as parts of the document or the entire document itself.

A large array of standards and products are available to help create and manage structured documents, depending on the goal and task at hand. If document interchange between platforms and fidelity to document format is the main concern, a compound document architecture (ODA, RTF, or CDA) may suffice. If document structure and manipulation are paramount, then the overwhelming choice is SGML.

- SGML (standard generalized markup language)-an ISO standard for interchange and multi formatting description of text documents in terms of their logical structure. SGML's biggest and most powerful supporter, the Department of Defense, has mandated SGML as the standard for electronic publishing in the Computer-Aided Acquisition and Logistics Support (CALs) program.
- ODA (office document architecture)-an ANSI and ISO standard for interchange of compound office documents. In contrast to SGML, which describes document

structure, ODA' specifies both content and format, Despite all the work that went into the standard, ODA is not considered to be a major player in the future of electronic publishing.

- CDA (compound document architecture)-Digital Equipment Corp. CDA defines a set of ground rules-content and format-and services for the interchange of compound documents between applications. CDA compliant applications can revise each other's documents even if the applications are written in different languages, run under different operating systems, and are located on the far corners of a distributed network. The most prominent use of CDA can be found in Lotus Notes, the popular groupware software.
- RTF (rich-text format)- initially developed by Microsoft for interchange of text between Microsoft desktop products, RTF has become widely used by other text-processing applications.

The table given below compares the advantages and disadvantages of these standards, of all these, the SGML standard seems to have the most momentum. SGML can "make text into a database," rendering it useful in the same way traditional databases are useful. It can provide editing, interchange, and search and retrieval capabilities. SGML provides these capabilities through the concept of descriptive or generalized markup.

<b>Technology</b>	<b>Advantages</b>	<b>Disadvantages</b>
Document interchange formats (ODA, CDA, or RTF)	Generate platform and application-independent information; keep format and styling; some even support audio graphics, and full-motion video.	Complex standards that require expertise to use; formats make users dependent on applications that can recognize the encoding used.
Document structure languages (SGML)	Allows the creation of document-type definitions that are like software programs specifically for document manipulation.	SGML does not support non text elements. Extensions such as HyTime provide this capability.

Table : Comparing Structured Document Formats

### ***Hypertext Documents***

The value of information increases when it moves to areas where some entity-individual or software program-can make use of it. Hypertext is a way of making document-based information more mobile. Mobility of information is necessary for the following reasons:

- Information in enterprises is seldom located on one node or server but is distributed throughout the organization.
- Accessing and retrieving large monolithic documents is time consuming. A good management strategy is to split them into smaller pieces to reduce user waiting and network utilization time. For users who spend time referencing very long documents, searching for information, and looking for interrelated documents, the simple viewing/browsing, such as scrolling up and down pages, is certainly out of the question. Support for hypertext functionality, enabling cross-referencing and conditional branching to related parts of an electronic document, is an essential requirement.
- Reuse of document fragments for composing new documents is more effective when information stored on individual systems and servers across an enterprise can be accessed from remote locations.

Relationships between documents can be represented through hypermedia links (hyperlinks) that allow the production of complex, richly connected and cross-referenced bodies of knowledge. This structuring and navigation mechanism has been used effectively to deal with the presentation of large amounts of loosely structured information, such as on-line documentation or computer-aided learning.

### ***Active Documents***

Active documents (or compound documents) represent what is known as document-oriented computing. Active documents provide an interactive interface where all

documents, applications, and data related to a particular task are assembled, arranged, and interlinked such a manner that the user can focus on the task at hand and be shielded from non task-related issues like access, storage, data formats, location, computing, or delivery mechanisms.

Active documents share the common goal of making the user's computing experience as easy and productive as possible, a goal that has remained an elusive but tantalizing prospect. As people use PCs for more and more complex tasks, often involving multiple programs and even a variety of media, they need to have better integration of various documents created by the diverse applications. This trend is evident in the shift taking place in the software development community from stand-alone, application-based computing toward integrated document-based computing.

#### **14.8 CORPORATE DATA WAREHOUSE**

Companies are focusing on developing data warehouses to leverage existing businesses and generate new growth opportunities. Today virtually every transaction and minute business detail in the corporate environment is recorded in databases in the hope that it will enable more effective decision making throughout the organization. Unfortunately, most of the corporate emphasis has been on storing data, while tools for accessing and transforming data into meaningful information have been somewhat ignored. As a result, business managers are forced to spend more time navigating the myriad sources of enterprise data than analyzing the information.

Take, for example, financial systems. In many companies, financial consolidation is done manually, with sales information from each outlet keyed into individual computer systems every night. The information is then sent to the corporate office, where it is posted to the mainframe accounting system, which has no analysis capabilities. Any analysis has to be completed via a second system by downloading the data, thus proving the process to be labor intensive and slow. Clearly there is a need for a central data warehouse that is populated with data automatically and provides effective retrieval and use of information.

The organizations buying into data warehousing for decision support exhibit the following characteristics:

- An information-based approach to decision making
- Involvement in highly competitive, rapidly changing markets with a large, diverse customer base for a variety of products
- Data stored in many systems and represented differently
- Data stored in complex, technical, difficult-to-decipher formats, making conversion for analysis difficult

Data warehouses are necessary as enterprise wide data increase in both volume and complexity, making it important to establish an information systems architecture that transforms scattered legacy data into useful information. The data warehouse performs the following functions:

- Allows existing transaction and legacy systems to continue in operation
- Consolidates data from the various transaction systems into a coherent set
- Allows analysis of vital information about current operations for decision support

Once the data are stored in the warehouse, companies can slice it several different ways, performing detailed, multidimensional “what-if” scenarios on various aspects of the companies’ operations. This capability enables users to gain insights into corporate performance and customer behavior that are not possible using disconnected operational computing systems.

### **Types of Data Warehouses**

The term data warehouse is currently being used to describe a number of different facilities each with diverse characteristics. Some companies use all of the following components of data warehousing in combination, others just one:

- *Physical data warehouse.* This is an actual, physical database into which all the corporate data for the data warehouse are gathered, along with the schemas (information about data) and the processing logic used to organize, package, and preprocess the data for end user access.
- *Logical data warehouse:* This contains all the metadata, business rules, and processing logic required to scrub, organize, package, and preprocess the data. In addition, it contains the information required to find and access the actual data, wherever it actually resides.
- *Data library:* This is a subset of the enterprise wide data warehouse. Typically, it performs the role of a departmental, regional, or functional data warehouse. As part of the data warehouse process, the organization builds a series of data libraries overtime and eventually links them via an enterprise wide logical data warehouse.
- *Decision support systems (DSSs):* These systems are not data warehouses but applications that make use of the data warehouse. They are also called executive information systems (EIS).

### **Advantages of Data Warehouses**

There are several advantages of the data warehouses. Few of them have been listed here:

#### ***Immediate information delivery***

Data warehouses shrink the length of time between when common business events occur and when management is alerted to those events. For example, in many organizations, sales reports are printed once a month normally within a week after the end of each month. Thus, the June sales reports are delivered no later than the first week in July. Although useful, this forces management into making decisions on a historical basis; recent history to be sure, but history nonetheless. With a data warehouse, those same reports can be made available on a daily basis. Given this data delivery time compression, business decision makers can exploit opportunities that they would otherwise miss.

### ***Data integration from across and even outside the organization***

To provide a complete picture, data warehouses typically combine data from multiple sources, such as a company's order entry, payables, materials planning, sales, and warranty systems. Thus, with a data warehouse, it becomes possible to track all facets of the interactions a company has with each customer—from that customer's first inquiry, through the terms of their purchase, all the way through any warranty or service interactions. This makes it possible for managers to have answers to questions such as, Is there a correlation between where a customer buys our product and the amount typically spent in supporting that customer.

### ***Future vision from historical trends***

Effective business analysis frequently includes trend and seasonality analysis. To support this, warehouses typically contain multiple years of data. In the following chapters, we will explore many techniques for analyzing and drawing conclusions from the vast store of historical data contained within the data warehouse.

### ***Tools for looking at data in new ways***

Beyond the long-standing paper report, a data warehouse provides its users with tools for looking at and manipulating data in many different ways. Oftentimes, a color-coded map speaks volumes over a simple paper report. An interactive table that allows the user to drill down into detail data with the click of a mouse can answer questions that might otherwise take months to answer using a more traditional approach.

### ***Freedom from is department resource limitations***

One of the problems with information systems is that they usually require computer experts to use them. When a report is needed, the requesting manager calls the IS department. IS then assigns a programmer to write a program to produce the report. The report can be created in a few days or, in extreme cases, it may take over a year. With the advent of the data warehouse, end users create most of their queries and report themselves. Thus, if a manager needs a special (ad hoc) report for a meeting in half an

hour, the manager can easily create that report without the help of the IS department or the departmental computer guru.

#### **14.9 THE INDIAN SCENARIO**

India has to be in the Information Highway as a sea of information is knocking at its doors. India has the expertise to meet the challenge and to set up digital libraries in the country. We are at the threshold of breaking into Cyberspace and navigate through, Internet and World Wide Web. Through Internet it has now become possible to a part of “Global Village” and exchange information instantly. World Wide Web (WWW) is the most advanced browsing and searching system deployed on Internet based on hypertext paradigm. WWW allows one to explore a seemingly unlimited world wide digital “WEB” of human knowledge. With all these facilities it is possible to access hundreds of databases and make the information available to the user community in the country. Availability of CD-ROM databases accessible through LAN and WAN is an added advantage.

The tools are there and the technology is there, so there is no excuse for us in India, not to start planning for digital libraries. A number of biomedical institutions in the country have already made a start and notable among these are National Informatics Centre, All India Institute of Medical Sciences in New Delhi; National Institute of Mental Health and Neurosciences in Bangalore and MGR University in Madras.

**National Informatics Centre (NIC):** NIC through NICNET (NIC satellite based communication network) has 500 odd V SAT at state and district offices. NIC has digital capabilities to support any kind of computer-communication facilities.

- On-line access to MEDLINE and AIDS databases
- Full text of selected journal articles
- .Information from databases accessible via internet .Information from other NLM databases
- Interactive access to CD-ROM databases



- On-line search of catalogue of biomedical databases
- Union catalogue of journals available in various biomedical journals
- Assistance in setting up MEDLARS search facilities
- User awareness programmes
- End-users training
- Assistance to many specialist institutions for developing databases in various specialty organization.

The NIC has been providing biomedical information services to the medical community in the country since 1987/88 starting from the MEDLARS (Medical Literature Analysis and Retrieval Systems) of National Library of Medicine, USA it has now reached a point where a number of databases are being accessed through Internet and WWW. Information from over 40 databases of MEDLARS is being provided to hundreds of doctors/clinicians, postgraduate students and the paramedical staff. Medical institutions and libraries in India can access MEDLINE data from almost any part of the country.

Special information packages on specific drugs and diseases are prepared for medical and health professionals during epidemics for patient care needs. This information can be transferred instantly over NICNET to the remotest parts of the country. Other major institutions like AIIMS and NIMHANS have procured a number of databases on CD-ROMs and are providing information services to their faculty. The DBT Centres are subscribing to gene, DNA and other protein sequence databases on CDs and are also accessing these databases through Internet.

NIC also understands to train the end users, largely including medical and health professionals in the information retrieval techniques. This enables them to shed all inhibitions and feel comfortable in accessing information in digitized format. With the existing scenario in India, it will not be a difficult task to start a network of digital libraries. This would enable a faster and reliable information access and satisfy the information seeker.

## 14.10 SUMMARY

Libraries around the world have been working on this daunting set of challenges for several years now. They have created many digital library initiatives and projects, and have formed various national schemes for jointly exploring key issues. With several years accumulated experience, the initial enthusiasm surrounding the development of the digital library has been replaced by sober second thought. Librarians have discovered that, with a few exceptions, making a business case for digitization and investments in digital technology is more difficult than first envisioned, especially given the technical and legal constraints that must first be overcome. As with most other technical developments in libraries over the years, we will have to move forward in small, manageable, evolutionary steps, rather than in an rapid revolutionary manner.

## 14.11 KEYWORDS

**PDF:** Portable Data File

**TIFF:** Tag Image File Format, format for interchange of bit-mapped images.

**ITU-TSS:** International Telecommunication Union-telecommunications standardization sector, the standard is used for compression and exchange of bit-mapped files.

**ODA:** Office Document Architecture)-an ANSI and ISO standard for interchange of compound office documents.

**RTF:** RTF (rich-text format)- initially developed by Microsoft for interchange of text between Microsoft desktop products.

**CDA:** CDA (compound document architecture)-Digital Equipment Corp. CDA defines a set of ground rules-content and format-and services for the interchange of compound documents between applications.

**SGML:** Standard Generalized Markup Language)-an ISO standard for interchange and multi formatting description of text documents in terms of their logical structure

**CALS:** Computer-Aided Acquisition and Logistics Support

**LOTUS NOTES:** A famous groupware software

**DSS:** Decision Support System

## 14.12 SELF-TEST QUESTIONS

1. What is a digital library? How it is different from traditional library?
2. Discuss the role of digital library in current scenario of LPG regime.
3. Discuss various issues involved in digital library.
4. What are major benefits of digital libraries?
5. List some major requirements of digital library.
6. What makes a digital library?
7. Discuss various types of documents available in digital library?
8. What is a data warehouse? Discuss major features of a data warehouse.

#### **14.13 SUGGESTED READINGS**

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