1 CHAPTER

ELECTRONIC COMMERCE— TECHNOLOGY AND PROSPECTS

1.1 INTRODUCTION

Commerce (the trading of goods) has been a major impetus for human survival since the beginning of recorded history and beyond. The mass adoption of the Internet has created a paradigm shift in the way businesses are conducted today. The past decade has seen the emergence of a new kind of commerce: e-commerce, the buying and selling of goods through human-computer interaction over the Internet. Traditional physical trading of goods and currency is becoming increasingly unpopular and more businesses are jumping on the e-commerce bandwagon. Today, the line between e-commerce and traditional commerce is becoming more blurred as more businesses start and continue to integrate the Internet and e-commerce technologies into their business processes.

1.2 DEFINITION OF E-COMMERCE

The e-commerce can be defined as a *modern business methodology that addresses the needs of organizations, merchants, and consumers to cut costs while improving the quality of goods and services and increasing the speed of service delivery, by using Internet.* It differs from the traditional electronic commerce (e-commerce) in the way that it enables the trading of goods, money and information electronically from computer to computer. Business is done electronically and there is no longer a need for physical currency or goods to conduct business.

1.3 EVOLUTION OF E-COMMERCE

Evolution of e-commerce can be attributed to a combination of regulatory reform and technological innovation. Though Internet (which played an important role in evolution) appeared in the late 1960s, e-commerce of today took off with the arrival of World Wide Web and browsers in early 1990s. The liberalization of the telecommunications sector and innovations such as optic fiber, DSL etc. (which has helped to expand the volume and capacity of communications) have helped in the process of that rapid growth. As a result the barriers to entry and engage in e-commerce have fallen rapidly. A brief timeline of evolution is as follows:

- 1969 Internet/APRAnet
- 1989 WWW HTML invented at CERN
- 1991 NSF lifts restrictions on commercial use of Internet
- 1993 Mosaic browser invented at University of Illinois, Urbana Champagne, is released to public
- 1994 Netscape releases Navigator browser
- 1995 Dell, Cisco, Amazon etc. began aggressively to use Internet for commercial transactions
- The growth of Internet has a special significance in the growth of e-commerce. It has the potential to involve general people into the process thereby increasing its reach far beyond large companies.

1.4 CONDUCTING BUSINESS ONLINE (E-COMMERCE)

Doing business online is electronic commerce, and there are four main areas in which companies conduct business online today:

1. Direct marketing, selling, and services.
2. Online banking and billing.
3. Secure distribution of information.
4. Value-chain trading and corporate purchasing.

1.4.1 Direct Marketing, Selling, and Services

Today, more websites focus on direct marketing, selling, and services than on any other type of electronic commerce. Direct selling was the earliest type of electronic commerce, and has proven to be a stepping-stone to more complex commerce operations for many companies. Successes such as Amazon.com, Barnes and Noble, Dell Computer, and the introduction of e-tickets by major airlines, have catalyzed the growth of this segment, proving the reach and customer acceptance of the Internet.

1.4.2 Financial and Information Services

A broad range of financial and information services are performed over the Internet today, and sites that offer them are enjoying rapid growth. These sites are popular because they help consumers, businesses of all sizes, and financial institutions distribute some of their most important information over the Internet with greater convenience and richness that is available using other channels. For example, you have:

- Online banking
- Online billing
- Secure information distribution

1.4.2.1 Online Banking

Consumers and small businesses can save time and money by doing their banking on the Internet. Paying bills, making transfers between accounts, and trading stocks, bonds, and mutual funds can all be performed electronically by using the Internet to connect consumers and small businesses with their financial institutions.

1.4.2.2 Online Billing

Companies whose bill can achieve significant cost savings and marketing benefits through the use of Internet-based bill-delivery and receiving systems. Today, consumers receive an average of 23 bills per month by mail from retailers, credit card companies, and utilities.

1.4.2.3 Secure Information Distribution

To many businesses, information is their most valuable asset. Although the Internet can enable businesses to reach huge new markets for that information, businesses must also safeguard that information to protect their assets. Digital Rights Management provides protection for intellectual and information property, and is a key technology to secure information distribution.

1.4.3 Maintenance, Repair, and Operations (MRO)

The Internet also offers tremendous time and cost savings for corporate purchasing of low-cost, high-volume goods for maintenance, repair, and operations (MRO) activities. Typical MRO goods include office supplies (such as pens and paper), office equipment and furniture, computers, and replacement parts. The Internet can transform corporate purchasing from a labor and paperwork-intensive process into a self-service application. Company employees can order equipment on websites, company officials can automatically enforce purchase approval and policies through automated business rules, and suppliers can keep their catalog information centralized and up-to-date. Purchase order applications can then use the Internet to transfer the order to suppliers. In response, suppliers can ship the requested goods and invoice the company over the Internet. In addition to reduced administrative costs, Internet-based corporate purchasing can improve order-tracking accuracy, better enforce purchasing policies, provide better customer and supplier service, reduce inventories, and give companies more power in negotiating exclusive or volume-discount contracts. In other words, the Internet and e-business have changed the way enterprises serve customers and compete with each other, and have heightened awareness for competing supply chains.

1.4.4 Value-Chain Integration

No other business model highlights the need for tight integration across suppliers, manufacturers, and distributors quite like the value chain. Delays in inventory tracking and management can ripple from the cash register all the way back to raw material production, creating inventory shortages at any stage of the value chain. The resulting out-of-stock events can mean lost business. The Internet promises to increase business efficiency by reducing reporting delays and increasing reporting accuracy. Speed is clearly the business imperative for the value chain.

1.5 ISSUES IN IMPLEMENTING ELECTRONIC COMMERCE

Although it is simple to describe their benefits, it is not nearly as easy to develop and deploy commerce systems. Companies can face significant implementation issues:

- Cost
- Value

- Security
- Leveraging existing systems
- Interoperability

1.5.1 Cost

Electronic commerce requires significant investments in new technologies that can touch many of a company's core business processes. As with all major business systems, electronic commerce systems require significant investments in hardware, software, staffing, and training. Businesses need comprehensive solutions with greater ease-of-use to help foster cost-effective deployment.

1.5.2 Value

Businesses want to know that their investments in electronic commerce systems will produce a return. Business objectives such as lead generation, business-process automation, and cost reduction must be met. Systems used to reach these goals need to be flexible enough to change when the business changes.

1.5.3 Security

The Internet provides universal access, but companies must protect their assets against accidental or malicious misuse. System security, however, must not create prohibitive complexity or reduce flexibility. Customer information also needs to be protected from internal and external misuse. Privacy systems should safeguard the personal information critical to building sites that satisfy customer and business needs.

1.5.4 Leveraging Existing Systems

Most companies already use information technology (IT) to conduct business in non-Internet environments, such as marketing, order management, billing, inventory, distribution, and customer service. The Internet represents an alternative and complementary way to do business, but it is imperative that electronic commerce systems integrate existing systems in a manner that avoids duplicating functionality and maintains usability, performance, and reliability.

1.5.5 Interoperability

When systems from two or more businesses are able to exchange documents without manual intervention, businesses achieve cost reduction, improved performance, and more dynamic value chains. Failing to address any of these issues can spell failure for a system's implementation effort. Therefore, your company's commerce strategy should be designed to address all these issues to help customers achieve the benefits of electronic commerce.

Your company's vision for electronic commerce should also be to help businesses establish stronger relationships with customers and industry partners. For example, a successful strategy for delivering this vision is described by three work-flow elements (platform, portal, and industry partners), each backed by comprehensive technology, product, and service offerings.

From self-service portals to transaction processing, a successful work-flow strategy can be the underlying engine delivering state-based, processed-focused control services for e-business applications. Human labor is expensive, and work-flow technology allows e-businesses to supplement, and in some cases eliminate, reliance on human supervision and intervention.

1.6 HOW DO YOU WORK WITH E-COMMERCE?

E-commerce is about setting your business on the Internet, allowing visitors to access your website, and go through a virtual catalog of your products/services online. When a visitor wants to buy something he/she likes, they merely "add" it to their virtual shopping basket. Items in the virtual shopping basket can be added or deleted, and when you're all set to checkout, you head to the virtual checkout counter, which has your complete total, and that will ask you for your name, address etc. and method of payment (usually via credit card). Once you have entered all this information (which by the way is being transmitted securely) you can then just wait for delivery.

1.7 COMPARISON BETWEEN TRADITIONAL COMMERCE AND E-COMMERCE

In many cases business processes use traditional commerce activities very effectively, and these processes cannot be improved upon through technology. Products that buyers prefer to touch, smell, or examine closely are difficult to sell using electronic commerce. For example, customers might be reluctant to buy high-fashion clothing and perishable food products, such as meat or produce, if they cannot examine the products closely before agreeing to purchase them. In the case of traditional commerce retail merchants have years of experience in creating store environments that help convince a customer to buy. This combination of store design, layout and product display knowledge is called *merchandising*. Sales people in course of time develop skills that allow them to identify customer needs and find products and services that meet those needs. The arts of merchandising and personal selling can be difficult to practice over an electronic link. Through e-commerce branded products such as *books* or *CDs* can be easily sold. As one copy of a new book is identical to other copies and because a customer would not be concerned about freshness he would willingly order a title without examining the specific copy they would receive. The advantage of electronic commerce, namely the ability of one site to offer a wider selection of titles than even the largest physical bookstore, can outweigh the advantage of a traditional bookstore, namely the facility to browse.

Some examples of business processes are listed in the following table that suit to the e-commerce and traditional commerce respectively.

Business processes well-suited to:

Electronic commerce	*Traditional commerce*
• Sale/purchase of books and CDs	• Sale/purchase of high-fashion clothing
• Online delivery of software	• Sale/purchase of perishable food products
• Advertising and promotion of travel services	• Small-denomination transactions
• Online tracking of shipments	• Sale of expensive jewelry and antiques

1.8 E-COMMERCE TECHNOLOGIES

What technologies are necessary for e-commerce? The short answer is that most information technologies and Internet technologies that we discuss throughout the book are involved in e-commerce systems, viz.–

- The Internet, intranets, and extranets are the network infrastructure or foundation of e-commerce.
- Customers must be provided with a range of secure information, marketing, transaction, processing, and payment services.
- Trading and business partners rely on Internet and extranets to exchange information and accomplish secure transactions; including electronic data interchange (EDI) and other supply chain and financial systems and databases.
- Company employees depend on a variety of Internet and intranet resources to communicate and collaborate in support of their EC work activities.
- Information system professionals and end users can use a variety of software tools to develop and manage the content and operations of the websites and other EC resources of a company.

1.9 ECONOMIC POTENTIAL OF E-COMMERCE

Consumers are pushing retailers to the wall, demanding lower process, better quality, a large selection of in-season goods. Retailers are scrambling to fill the order. They are slashing back-office costs, reducing profit margins, reducing cycle times, buying more wisely, and making huge investments in technology. They are revamping distribution channels to make sure that warehouse costs are down by reducing their average inventory levels and coordinating the consumer demand and supply patterns. In the push to reduce prices, more and more retailers are turning to overseas suppliers, in part because of cheaper labor costs. The effect of e-commerce can also be seen over the retail industry and marketing.

1.9.1 E-commerce and Retail Industry

Retailers are in the immediate line of fire and are first to bear the brunt of cost cutting. They are putting that pressure on the manufacturing and supplier end of the pipeline. At the same time, the quest for efficiencies has led to turmoil and consolidation within the retail industry. The pressure experienced by retailers and suppliers can be seen in the disappearance of jobs, in mergers, and in the increase in business failures in the manufacturing sector.

The problems are indeed serious. Electronic markets could provide a partial solution by promising customers more convenience and merchants greater efficiency and interactivity with suppliers to revitalize the troubled retailing sector.

1.9.2 E-commerce and Marketing

Electronic commerce is forcing companies to rethink the existing ways of doing target marketing (isolating and focusing on a segment of the population), relationship marketing (building and sustaining a long-term relationship with existing and potential

customers), and even event marketing (setting up a virtual booth where interested people come and visit). Consider the case of conventional direct marketers, who devote some 25 percent of their revenues to such costs as printing and postages for catalogs. Interactive marketing could help cut such expenses and may even deliver better results.

Interactive marketing is accomplished in electronic markets via interactive multimedia catalogs that give the same look and feel as a shopping channel. Users find moving images more appealing than still images and listening more appealing than reading text on screen. Those are two powerful reasons why every text-based and still-picture-based interactive experimental-based service has ever generated anywhere near the volume of retail merchandise orders that televised shopping channels have achieved. Maximum public acceptance will require that interactive catalog services have a more entertaining visual appearance than traditional text-intensive catalogs have had. Ideally, an interactive shopping program should produce full-motion demonstrations of selected products, but such a practical and economical technology has yet to be developed.

1.10 INCENTIVES FOR ENGAGING IN E-COMMERCE

A basic fact of Internet retailing is that all retail websites are created equal as far as the "location, location, location" imperative of success in retailing is concerned. No site is any closer to its web customers and competitors offering similar goods and services may be only a mouse click away. This makes it vital that businesses find ways to build customer satisfaction, loyalty, and relationships, so customers keep coming back to their web stores. Thus, the key to e-commerce success is to optimize several key factors such as selection and value, performance and service efficiency, the look and feel of the site, advertising and incentives to purchase, personal attention, community relationships, and security and reliability. The incentives for engaging in e-commerce are listed as follows:

1. **Selection and Value.** Attractive product selections, competitive prices, satisfaction guarantees, and customer support after the sale.
2. **Performance and Service.** Fast, easy navigation, shopping, and purchasing, and prompt shipping and delivery.
3. **Look and Feel.** Attractive web storefront, website shopping areas, multimedia product catalog pages, and shopping features.
4. **Advertising and Incentives.** Targeted web-page advertising and e-mail promotions, discounts and special offers, including advertising at affiliate sites.
5. **Personal Attention.** Personal web pages, personalized product recommendations, web advertising, and e-mail notices, and interactive support for all customers.
6. **Community Relationships.** Virtual communities of customers, suppliers, company representatives, and others via newsgroups, chat rooms, and links to related sites.
7. **Security and Reliability.** Security of customer information and website transactions, trustworthy product information, and reliable order fulfillment.

1.11 DRIVING FORCES BEHIND E-COMMERCE

The various driving forces behind e-commerce can be listed as below:

1. **Global Customers.** Customers are people who may travel anywhere or companies with global operations. Global IT can help provide fast, convenient service.
2. **Global Products.** Products are the same throughout the world or are assembled by subsidiaries throughout the world. Global IT can help manage worldwide marketing and quality control.
3. **Global Operations.** Parts of a production or assembly process are assigned to subsidiaries based on changing economic or other conditions. Only global IT can support such geographic flexibilities.
4. **Global Resources.** The use and cost of common equipment, facilities, and people are shared by subsidiaries of a global company. Global IT can keep track of such shared resources.
5. **Global Collaborations.** The knowledge and expertise of colleagues in a global company can be quickly accessed, shared, and organized to support individual or group efforts. Only global IT can support such enterprise collaboration.

1.12 ADVANTAGES OF E-COMMERCE

With the astonishing growth of the Internet, many companies are finding new and exciting ways to expand upon their business opportunities. There are very few successful companies that do not use computers in their everyday business activities, which also mean there are few companies that do not use e-commerce. These are the advantages of Internet and e-commerce in general:

1. **Speed.** The Internet and World Wide Web give businesses opportunities to exchange messages or complete transactions almost instantaneously. Even with the slowest connections, doing business electronically is much faster than traditional modes. With increased speeds of communication, the delivery time is expedited and that makes the whole transaction from start to finish more efficient. Even more significant is the fact that information appearing on the Internet can be changed extremely rapidly. This gives business owners the ability to inform customers of any changes to the service that you are offering. This also allows for you to update marketing and promotional materials as often and as frequently as you would like.
2. **Cost Saving.** By using the Internet, marketing, distribution, personnel, phone, postage and printing costs, among many others, can be reduced. You can start doing business in cyberspace for as little as thousand of rupees. Most businesses will spend more than this but compared to the cost of opening a physical store, the savings are tremendous. These funds can then be diverted to marketing and advertising of your product or service.
3. **No Boundaries.** Cyberspace does not know any national boundary. That means you can do business all over the world as easily as you can in your own neighborhood. Since the Internet connects everyone in cyberspace, information is transmitted at the speed of sound or the speed of light, depending on your

connection. Either way, distance becomes meaningless, which makes you able to link to anyone on the globe and anyone on the globe can link to you. The ability to provide links makes doing business on the Internet attractive to customers in any part of the world.

4. **Ease of Networking.** One advantage of the Internet is that is allows people to easily meet, gather data/information and stay in touch with others at a very low cost. Now almost everyone can automatically expose his/her business to the international market. The web will enable firms to build on the assets that they already possess, like brand name recognition, operational infrastructure, information, and customer relationships in order to develop new markets and distribution channels. Meeting with new network locally and from other countries can be done anytime and anywhere now.

1.12.1 Advantages to Customers

1. **Reduced Prices—**Costs of products are reduced since stages along the value chain are decreased. For instance, intermediaries can be eliminated by the company directly selling to the consumer instead of distributing through a retail store.
2. **Global Marketplace—**Consumers can shop anywhere in the world. Currently, according to the World Trade Organization (WTO) there are no custom duties put on products bought and traded globally electronically. This also provides wide selection of products and services to consumers.
3. **24-Hour Access—**Online businesses never sleep as opposed to brick and mortar businesses. E-commerce allows people to carry out businesses without the barriers of time or distance. One can log on to the Internet at any point of time, be it day or night and purchase or sell anything one desires at a single click of the mouse.
4. **More Choices—**Provides consumers with more choices. For example, before making any purchase, customer can study about all the major brands and features of any item. It also provides consumers with less expensive products and services by allowing them to shop in many places and conduct quick comparisons.
5. **Quicker Delivery—**Allows quick delivery of products and services (in some cases) especially with digitized products.
6. Consumers can receive relevant and detailed information in seconds, rather than in days or weeks.
7. Makes it possible to participate in virtual auctions.
8. Allows consumers to interact with other consumers and electronic communities and exchange ideas as well as compare experiences.

1.12.2 Advantages to Businesses

1. **Increased Potential Market Share—**The Internet enables businesses to have access to international markets thereby increasing their market share. Companies can also achieve greater economies of scale.

2. **Low-cost Advertising—**Advertising on the Internet costs less than advertising on print or television depending on the intricacies and extent of the advertisement. A company can still spend a lot on advertising on the Internet if the company hires an external party to create their advertisements but advertising on the Internet itself is less costly since there is less cost associated with it in terms of printing and limited television spots.
3. **Low Barriers to Entries—**Anyone can start up a company on the Internet. Start-up costs are a lot lower for companies since there is less need for money for capital.
4. **Strategic Benefit—**The strategic benefit of making a business 'e-commerce enabled' is that it helps reduce the delivery time, labour cost and the cost incurred in the following areas:
    - Document preparation
    - Error detection and correction
    - Reconciliation
    - Mail preparation
    - Telephone calling
    - Data entry
    - Overtime
    - Supervision expenses

1.12.3 Advantages to Society

1. Enables people in Third world countries and rural areas to enjoy products and services which otherwise are not available to them.
2. Facilitates delivery of public services at a reduced cost, increases effectiveness, and/or improves quality.
3. 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.
4. Allows some merchandise to be sold at lower prices since organization may not need a physical place and full inventory.

1.12.4 Advantages to Women

People in general think that women unlike men are reluctant to purchase online. On the contrary, NPD research found that women tend to shop online more than men in most product categories. The study asserts that women were more likely to shop toys, clothing, games and make up online more than men.

In short all the major advantages of e-commerce can be summarized as follows:

1. Cost reduction due to competitiveness in the procurement of products. Many suppliers of the product compete for customer patronage in open electronic markets. This competition brings down the product price.

2. Cost reduction due to reducing the paper work. The cost effective electronic documents will be delivered almost instantly and safely. This enables both parties to take quick decisions.
3. Information dissemination at a wider level is possible. Information about the product, cost, size, specification etc. may be made available to the customer located at widely distant geographical boundaries.
4. Improved customer relationship may be achieved by fast dissipation of the information to the potential customers.
5. Because all orders and inquiries are processed online, the product is directly supplied to the customer. This eliminates the need for wholesalers and retailers and brings down the product prices.
6. Total time reduction in the order processing, as e-commerce minimizes the time taken from order to delivery.
7. Provides better, fast and effective linkage with the clients. Since all information has to be processed in the electronic medium, that is online, it is possible to identify the customers' requirements that lead to quick product design.
8. Opens new vistas for the organization and generates better business avenues because of easy and cheap reach to the potential customer base.
9. Enhances the organization's product and market analysis as the organization gets faster feedback from the customer. These feedbacks may be processed online.

1.13 E-COMMERCE DISADVANTAGES

Although the list of e-commerce advantages is long, yet the e-commerce environment is far from perfection. In fact, some of the e-commerce disadvantages cause both consumers and businesses to suffer considerable misfortune. Although cost savings are usually mentioned, there are hidden costs that can quickly turn a credit into a debit. In addition, the technology is not perfect, for example, the network unreliability is a continuing concern. Moreover, some other concerns involve security, the loss of privacy, low and remote service levels, and complex legal issues. Let us discuss these disadvantages one by one.

1.13.1 Hidden Costs

Although buying on-line is convenient, the cost of this convenience is not always clear at the front end. For example, on-line purchases are often accompanied by high shipping and re-stocking fees, a lack of warranty coverage, and unacceptable delivery times. The online purchases must be shipped and the shipping charges may be considerable. In fact, too many e-commerce companies have developed a reputation of overcharging for shipping and handling.

1.13.2 Network Unreliability

With a user population of well over 100 million in North America alone, the Internet is a very busy information highway. Although the Internet is designed to overcome the single point of failure problem, there have been several well-publicized incidents of

network failures during the past few years. An e-commerce website that cannot serve its customers loses sales, credibility, and even customers. In effect, a network failure can be compared to having a location at an exclusive mall that is in middle of nowhere and has no access roads that lead to it. Network reliability problems may be generated by such factors as:

- Equipment failure in the network connection provider or ISP.
- Long response time due to increased network traffic or inadequate bandwidth.
- Accidental problems caused by nature—such as lightning, floods, earthquakes that affect communication lines—or by human error—such as a road construction worker severing a network line by accident.

1.13.3 The Cost of Staying in Business

We included operational cost savings and lower barriers of entry in the list of e-commerce advantages. That is, getting into business is relatively easier in an e-commerce environment. Unfortunately, the flip side of the coin is that staying in business may be more difficult. Remember that the easy access means increased competition, thus causing businesses to operate with very thin profit margins. To be profitable, e-businesses must maintain high sales volumes, which in turn means developing and maintaining a big and loyal customer base. Attracting customers and transforming them into repeat buyers is the key to profitability. To survive and remain competitive, businesses must invest heavily in often-costly technology. The introduction of computer technology within a business not only automates the business process but it also changes the way the company does business internally and externally. Such synergy between technology and business operations makes the company more dependent on technology, therefore making it more vulnerable to the pace and network failures.

1.13.4 Lack of Security

One of the main roadblocks to the wide acceptance of e-commerce by businesses and consumers alike is the perceived lack of adequate security for on-line transactions. For example, consumers are growing increasingly weary about providing credit card information over the Internet. During the past few years, the press has been filled with reports about hackers breaking into e-business websites and stealing credit card information. In many cases, the break-ins passed inadvertently for several months before either the seller or the buyer discovered the problem.

Securing on-line transaction data during its generation and then safeguarding it after it has been stored in the database are critical issues to be faced. For example, in June of 2001, a small computer retailer exposed credit card information through its website. The problem, caused by a coding error in a web page, allowed unauthorized access to stored order and credit card information for thousand of customers, dating as far back as one year.

1.13.5 Lack of Privacy

Ensuring the security of the data is of paramount importance to customers and to the credibility of the business. Customers also worry about the privacy implications of

data gathered by organizations of all types and sizes. The incredible data collection process is a mixed blessing to customers. Even at the simplest data level, sales information is stored in databases connected to web servers, thus exposing the information to cyber criminals. Because data gathering on the web is so easy, databases routinely contain information about customer purchasing habits, demographic data, credit information, and so on.

In many cases, companies sell customer database information to marketing companies. In turn, the marketing companies engage in massive e-mail campaigns to attract new customers. It doesn't take long for the customer's e-mail box to be filled with unwanted and unsolicited e-mail (also known as "spam"). The growing sales of personal firewalls and the large number of "hits" on websites that deal with privacy issues are testimony to the fact that customers are growing increasingly worried about their online privacy, and that they are seeking ways to protect themselves from cyber attackers.

1.13.6 Low Service Levels

Another common complaint about doing business online is the low level of customer service that online companies tend to provide. Although technology has automated business transactions to a large extent, there remains a real need for the human touch. Therefore, customer service has become a major differentiating factor. Because the web buying experience is much more impersonal than the traditional one, providing good customer service is critical to the survival of any e-business. Therefore, e-commerce websites must provide

- a pleasant and problem-free pre-ordering and ordering experience. The website design is an important interface.
- readily available easily used feedback options. Major customer complaints include the lack of contact information on websites and the difficulty of contacting a customer service representative.
- quick and courteous complaint resolution.
- timely and low-cost shipping and prompt delivery of merchandise to customers.

1.13.7 Legal Issues

Legal problems encountered in the e-commerce environment include

- Software and copyright infringements. The amount of illegal content flowing freely on the Internet is illustrated by the so-called Napster case. Napster, a popular music website, was sued by the Recording Industry Association because it hosted millions of illegal digital copies of copyrighted songs that were freely downloaded by millions of users worldwide. After court action, Napster was forced to change its business model and to eliminate all illegal material from its website.
- Credit card fraud and stolen identities. The lack of security we mentioned earlier has put credit card fraud on the proverbial front burner. In addition, lack of security makes it relatively easy to assume another person's identity in order to make fraudulent transactions. Loss of confidence in the security of on-line transactions is a brake on the e-business train.

- Business fraud. Online fraud also takes the form of companies that fail to deliver products and/or services to the customers who paid for them.

1.14 REASONS FOR THE E-COMMERCE NOT BEING VERY SUCCESSFUL

Although vast amounts of money have been invested into making e-commerce work, and although it causes vast amounts of money and large numbers of goods to change hands every day, it has so far failed to deliver the goods for a broad audience. The answer to why e-commerce has not been an overwhelming success for the masses can roughly be answered as follows:

1. Not everybody has access to a computer.
2. Buying goods over the internet is not 'natural':
   - One cannot feel or see the products in real life
   - The interaction is unnatural, there is no salesperson present.
3. People are concerned that it is unsafe to buy over the internet.

1. Limited Access to Computers

The computer is very essential to access e-commerce sites on Internet. Using a computer screen, people have visual access to a large amount of information, i.e., large number of goods to choose from. They can browse, select, get in-depth information, get overviews and so on, all at the click of a mouse button. But still in India or abroad, a large number of people do not have access on computers and therefore they are not able to take the advantage of the era of e-commerce.

2. Lack of Natural Quality

There are two issues to be addressed with respect to lack of natural quality in e-commerce.

The first pertains to the fact that people are not able to touch and feel products with their own hands before buying something. Buying something from just the picture is essentially different from buying it in a shop. People probably only tend to buy things over the internet from which they already know what they look/feel/sound like from real life, and which have little between-product variation (examples are books, CDs and videotapes) or products that they can assess from behind their computer (an example is software). This seems to be a problem for e-commerce, which can be labeled as the 'Seeing is believing' problem.

The second natural quality problem has to do with natural interaction during a purchase. People are used to talking to a salesperson when they purchase something. Asking questions like: "Is this product really waterproof?" or "Do I get a money back guarantee on this item?" and thousands of questions like these seem to sooth people in their purchase. It guarantees them that they get what they want. This kind of question-asking is of course not available in e-commerce, aside may be from some FAQ section (FAQ = Frequently Asked Questions).

3. Unsafe Buying

A third problem of e-commerce is that of unsafe connections to the vendor. When sending credit card information over the internet, hackers could seize this information and use it for illegal transactions.

1.15 TYPES OF E-COMMERCE/E-COMMERCE MARKET MODELS

E-commerce conducted between businesses differs from that carried out between a business and its consumers. There are five generally accepted types of e-commerce:

- Business to Business (B2B)
- Business to Consumer (B2C)
- Consumer to Business (C2B)
- Consumer to Consumer (C2C)
- Business to Government (B2G)

1.15.1 Business to Business (B2B)

Business to Business or B2B refers to e-commerce activities between businesses. An e-commerce company can be dealing with suppliers or distributors or agents. These transactions are usually carried out through Electronic Data Interchange or EDI. EDI is an automated format of exchanging information between businesses over private networks. This allows more transparency among business involved; therefore business can run more efficiently, for instance, a supplier can respond faster to diminishing stock of a particular product. EDI is composed of standards that enable businesses' computers to conduct transactions with each other without human intervention. In general, B2Bs require higher security needs than B2Cs. For example, manufacturers and wholesalers are B2B companies.

With the help of B2B e-commerce, companies are able to improve the efficiency of several common business functions, including supplier management, inventory management and payment management.

Using e-commerce enabled business applications, companies are able to better control their supplier costs by reducing PO (purchase order) processing costs and cycle times. This has the added benefit of being able to process more POs at a lesser cost in the same amount of time. E-commerce technology can also serve to shorten the order-ship-bill cycle of inventory management by linking business partners together with the company to provide faster data access. Businesses can improve their inventory auditing capabilities by tracking order shipments electronically, which results in reduced inventory levels and improves upon the ability of the company to provide "just-in-time" service.

This e-commerce technology is also being used to improve the efficiency of managing payments between a business and its partners and distributors. By processing payments electronically, companies are able to lower the number of clerical errors and increase the speed of processing invoices, which results in lowered transaction fees.

1.15.2 Business to Customer (B2C)

Business to Customer or B2C refers to e-commerce activities that are focused on consumers rather than on businesses. For instance, a book retailer would be a B2C company such as Amazon.com and other companies that follow a merchant model or brokerage business models. Other examples could also be purchasing services from an insurance company, conducting online banking and employing travel services.

1.15.3 Customer to Business (C2B)

Customer to Business or C2B refers to e-commerce activities, which use reverse pricing models where the customer determines the prices of the product or services. In this case, the focus shifts from selling to buying. There is an increased emphasis on customer empowerment.

In this type of e-commerce, consumers get a choice of a wide variety of commodities and services, along with the opportunity to specify the range of prices they can afford or are willing to pay for a particular item, service or commodity. As a result, it reduces the bargaining time, increases the flexibility and creates ease at the point of sale for both the merchant and the consumer.

1.15.4 Customer to Customer (C2C)

Customer to Customer or C2C refers to e-commerce activities, which use an auction style model. This model consists of a person-to-person transaction that completely excludes businesses from the equation. Customers are also a par of the business and C2C enables customers to directly deal with each other. An example of this is **peer auction giant, Ebay**.

1.15.5 Business to Government (B2G)

It is a new trend in e-commerce. This type of e-commerce is used by the government departments to directly reach to the citizens by setting-up the websites. These websites have government policies, rules and regulations related to the respective departments. Any citizen may interact with these websites to know the various details. This helps the people to know the facts without going to the respective departments. This also saves time of the employees as well as the citizens. The concept of Smart City has been evolved from B2G e-commerce.

1.16 DIFFERENCES BETWEEN B2C AND B2B E-COMMERCE

From all the e-commerce models described above, the two most widely used models are B2C and B2B e-commerce. The major difference between these two models is with the customer. In B2B (business-to-business) model, the customers are other companies while in B2C (business to consumer), the customers are individuals. Overall, B2B transactions are more complex and have higher security needs. Beyond that, there are two big distinctions:

- **Negotiation.** Selling goods to another business involves bargaining over prices, delivery and product specifications. Not so with most consumer sales. That makes it easier for retailers to put a catalog online, and this is why the first

B2B applications were for buying finished goods or commodities that are simple to describe and price.

- **Integration.** Retailers don't have to integrate with their customers' systems. Companies selling to other businesses, however, need to make sure they can communicate without human intervention.

1.17 ARCHITECTURAL FRAMEWORK FOR E-COMMERCE

Architectural framework of e-commerce means the synthesizing of various existing resources like DBMS, data repository, computer languages, software agent-based transactions, monitors or communication protocols to facilitate the integration of data and software for better applications.

The architectural framework for e-commerce consists of six layers of functionality or services as follows:

1. Application services.
2. Brokerage services, data or transaction management.
3. Interface and support layers.
4. Secure messaging, security and electronic document interchange.
5. Middleware and structured document interchange, and
6. Network infrastructure and the basic communication services.

1. **Applications:** In the application layer services of e-commerce, it is decided that what type of e-commerce application is going to be implemented. There are three types of distinguished e-commerce applications i.e., consumer to business application, business-to-business application and intra-organizational application.
2. **Information Brokerage and Management Layer:** This layer is rapidly becoming necessary in dealing with the voluminous amounts of information on the networks. This layer works as an intermediary who provides service integration between customers and information providers, given some constraint such as low price, fast services or profit maximization for a client. For example, a person wants to go to USA from India. The person checks the sites of various airlines for the low-price ticket with the best available service. For this he must know the URLs of all the sites. Secondly, to search the services and the best prices, he also has to feed the details of the journey again and again on different sites. If there is a site that can work as information broker and can arrange the ticket as per the need of the person, it will save the lot of time and efforts of the person. This is just one example of how information brokerages can add value.

   Another aspect of the brokerage function is the support for data management and traditional transaction services. Brokerages may provide tools to accomplish more sophisticated, time-delayed updates or future-compensating transactions.
3. **Interface and Support Services:** The third layer of the architectural framework is interface layer. This layer provides interface for e-commerce applications. Interactive catalogs and directory support services are the examples of this layer.

Interactive catalogs are the customized interface to customer applications such as home shopping. Interactive catalogs are very similar to the paper-based catalog. The only difference between the interactive catalog and paper-based catalog is that the first one has the additional features such as use of graphics and video to make the advertising more attractive.

Directory services have the functions necessary for information search and access. The directories attempt to organize the enormous amount of information and transactions generated to facilitate e-commerce.

The main difference between the interactive catalogs and directory services is that the interactive catalogs deal with people while directory support services interact directly with software applications.

4. **Secure Messaging Layer:** In any business, electronic messaging is an important issue. The commonly used messaging systems like phone, fax and courier services have certain problems like in the case of phone if the phone line is dead or somehow the number is wrong, you are not able to deliver the urgent messages. In the case of courier service, if you want to deliver the messages instantly, it is not possible as it will take some time depending on the distance between the source and destination places. The solution for such type of problems is electronic messaging services like e-mail, enhanced fax and EDI.

   The electronic messaging has changed the way the business operates. The major advantage of the electronic messaging is the ability to access the right information at the right time across diverse work groups.

   The main constraints of the electronic messaging are security, privacy, and confidentiality through data encryption and authentication techniques.

5. **Middleware services:** The enormous growth of networks, client server technology and all other forms of communicating between/among unlike platforms is the reason for the invention of middleware services. The middleware services are used to integrate the diversified software programs and make them talk to one another.

6. **Network Infrastructure:** We know that the effective and efficient linkage between the customer and the supplier is a precondition for e-commerce. For this a network infrastructure is required. The early models for networked computers were the local and long distance telephone companies. The telephone company lines were used for the connection among the computers. As soon as the computer connection was established, the data traveled along that single path. Telephone company switching equipment (both mechanical and computerized) selected specific telephone lines, or circuits, that were connected to create the single path between the caller and the receiver. This centrally-controlled, single-connection model is known as **circuit switching.**

However, circuit switching does not act well for sending data across a large network. In order to implement circuit switching, point-to-point connections for each pair of senders/ receivers has to be established which is both expensive and difficult to manage. There is one more technique that is used by the Internet. It is called a *packet switching*

network. In a packet switching network, files and messages are broken down into packets that are labeled electronically with codes that indicate both their origin and destination. Packets travel from computer to computer along the network until they reach their destination. The destination computer collects the packets and reassembles the original data from the pieces in each packet. In packet switching, as the packet passes through various computers on its line the computers determine the best way to move the packet forward to its destination.

1.18 TCP/IP INTERNET PROTOCOL FOR NETWORK INFRASTRUCTURE

A protocol is a collection of rules for formatting, ordering, and error-checking data sent across a network. Protocols determine how the sending device indicates that it has finished sending a message and how the receiving device will indicate that it has received (or not received) the message.

The set of protocols that underlie the basic operation of the Internet are Transmission Control Protocols (TCP) and the Internet Protocol (IP). The TCP/IP is a two-layered program that computers use to make and break communication in a network. TCP controls assembly of the message into smaller packets before it is transmitted over the Internet. It also controls the reassembly of packets at the destination sites. The IP protocol consists of rules for routing individual data packets from their source to their destination. IP ensures that each data packet is labeled with the correct destination address.

1.19 IMPACT OF E-COMMERCE ON BUSINESS

E-commerce will change the way the businesses are being carried on. It will lead to the emergence of new businesses as well as business practices and also a new role for intermediaries. Indeed, all the functional areas of business will undergo change as follows:

- The new technology will transform business processes, the way products and services are created and marketed, dynamics of competitions, the organization structure of the enterprise and the nature of the enterprise itself. This will include marketing, supply management, customer and sales management, product development etc.
- Local proximity may no longer be a significant factor in retaining customer. Local markets will be replaced by global markets. Indeed it may bring to reality the goal of making the whole world as one family.
- Transparency and openness continue and will continue, to be effective business strategy. Already many businesses have started recognizing key customers, employees and suppliers more like a partner in the business. E-commerce will lead to better customer service, more personalized products, reduced costs, supply chain efficiency and faster time to market. The most significant aspect of e-commerce is new market development. The e-commerce links and the infrastructure, initially set up, can be successfully used in other sectors.
- The change in the business functions will lead to new business models and create new set of facts and circumstances that can materially change the incidence of taxation.

- The Internet will emerge as a new platform for marketing of products and services that will displace and rebuild existing economy. It will affect organizational structure; require different skills for negotiation, new regulatory and legal framework, electronic money, taxation and many other things. The evolution of e-commerce will have profound impact on competition, mobility of enterprises, effect on consumer behavior, changes in the way the work is defined and managed. The net will enable businesses to save time on product design, design according to the individual customer specification, order and delivery of components, tracking sales and getting feedback from customers.
- The businesses can have virtual project team, virtual learning space so that the employees who are dispersed over various countries can work together as if they are together in one physical room. Business can be connected to the retail points in order to ascertain market trends, demand of the products and with the suppliers upstream to order the desired requirements. Better demand forecasting and stock replenishment can lead to significant reduction in the cost.

1.20 APPLICATIONS OF E-COMMERCE

Following are some of the widely used e-commerce applications.

Internet Bookshops

It is one of the first applications of e-commerce on Internet. Books as an item of merchandize have the following significant advantages for the online retailers:

- Books can be described well on the Internet. Moreover, it is not an item, which is required to be checked physically.
- Normally, the books have nominal prices and not too much risk is involved in the online payments.
- Books are small items and can be delivered in the customer's letterbox. The customer does not need to be at home.

Amazon.com is an example of Internet bookshops. The large online bookstores need a sophisticated website, both to attract and retain the attention of their customers. The facilities of the online bookshop may include:

- A large database of books. The details available for display include a picture of the cover, description of the book including page numbers, price of the book and reviews of other customers also if possible.
- The book can be searched with the help of search engines. The search can be made on the author's name, title of the book or the subject etc.
- There may be software on the site, that may record the interest of the particular customer and can inform the customer on the new arrivals on that subject.

Some large online bookshop sites are:

- www.amazon.com
- www.barnsandnoble.com
- www.bol.com
- www.bookshop.blackwell.co.uk

Grocery Supplies

One who goes to purchase items from the supermarket must be aware of some of the similar problems as described below.

- The customer has to plan to go to the supermarket at the scheduled time of opening of the supermarket.
- The car park may be overcrowded.
- The supermarket may also have a big crowd.
- You have to pick the items and wait for your turn for billing.
- You have to unload the items on the checkout, reload into bags, load again into the car, take to the home and unload again from the car.

All these problems may be resolved with the help of online supermarket. The online supermarket is set up to meet the needs of those who cannot get to the supermarket or those who do not want to go.

The online supermarket is similar to any other online shop. The customer has to log-on on the site and select the groceries that are required. The staff pick the goods, pack and dispatch them.

Some of the noteworthy sites for grocery supplies are as follows:

- www.peapod.com
- www.homestore.com
- www.sainsbury.co.uk
- www.tesco.net

Electronic Newspapers

One of the hot areas on the Internet is the electronic newspaper. Electronic newspaper has advantages over both, the printed newspapers and the broadcast news on radio and televisions. In comparison to printed newspaper, the e-newspaper can give up-to-date news similar to broadcast news. Further, the browser could be set to select the news of interest of the reader and to leave out the rest. This is not possible with the broadcast news.

Despite the said advantages, the electronic newspapers are not being very popular due to the following reasons:

- Radio and television news are often consumed while people are doing other things like eating their foods or driving a car.
- Printed newspapers may be read on the train or in the park and then may be shared with someone else.
- The printed newspapers give the reader the chance to be selective (the selection depends on the moods and time of the reader).

There are a number of online newspapers and most of them are web versions of existing newspapers. For example:

- www.timesofindia.com
- www.dainikjagran.com

Internet Banking

Sometimes the bank, customers want to make an urgent payment but to visit the bank is not convenient. Similarly, to go to the bank to just know the balance is also not justified. Internet banking (or telephone banking) can solve these problems. To solve the problems on phone or Internet is also profitable for banks as it reduces their overheads.

With the help of online banking a customer can check his or her balance at any time of the day or night. The customer can also pay various bills like telephone, electricity etc. without going to the bank or billing centers. The typical services offered by the online banking are as follows:

- The customers can check their account balances at any time.
- The customer can obtain statements regarding any specific debit or credit that has gone through.
- Credit transfers so that bill can be paid online.
- Maintenance of standing orders and direct debits.
- The major service that is not provided is cash in and cash out. To get the money, the customer has to go to the bank or ATMs.

Some sites related to Internet banking are as follows:

- www.rbs.co.uk
- www.smile.co.uk

You cannot use the services provided by the online banks till you are not the customer.

Electronic Auctions

Auctions have been a well-established market mechanism for trading items at a market negotiated price, based upon demand and supply. The Internet has added a new dimension by creating an online mechanism for implementing the auction process. Traditional auctions had limited participation of people who turned up at the place of auction. Today, the same auction mechanisms can be implemented using e-commerce technologies, allowing people connected through the Internet to bid. Electronic auctions potentially encourage greater participation as Internet users can connect to a webhosting an auction and bid for an item. www.wbay.com <http://www.wbay.com> and www.auctionindia.com <http://www.auctionindia.com> are the examples of such sites.

QUESTIONS

1. Define e-commerce. Name the areas in which companies conduct business online and explain each of them.
2. Discuss the significant issues that are required to implement e-commerce in organization.
3. How do you purchase or sell items or products on Internet?
4. Differentiate between the traditional commerce and e-commerce.
5. What technologies are required for e-commerce?

6. Discuss the economic potential of e-commerce. How does it effect marketing and retail industry?
7. List and explain about the incentives for engaging in e-commerce.
8. What are the various driving forces behind e-commerce.
10. Discuss the advantages of e-commerce in reference to the following:
    (*i*) Customers
    (*ii*) Business
    (*iii*) Society
    (*iv*) Women
11. Write a short note on disadvantages of e-commerce.
12. Why is the network reliability very important for e-commerce? What factors cause problems for network reliability?
13. What is the effect of cost factors on e-commerce?
14. Discuss the reasons for e-commerce not being very successful.
15. What are the various types of e-commerce? Explain each in short.
16. Write down the differences between B2C and B2B e-commerce.
17. What do you understand by architectural framework for e-commerce? Explain the various services that form the e-commerce architectural framework.
18. Write short notes on the following:
    (*a*) TCP/IP protocol for network structure
    (*b*) Impact of e-commerce on business
    (*c*) Applications of e-commerce