Eastern Economy Edition

THIRD EDITION

E-Commerce

An Indian Perspective

PHI

P.T. Joseph, S.J.

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Preface

We are in the age of knowledge and consequently in the midst of an electronic revolution, the impact of which on the economy is much more profound than that caused by the Industrial revolution. This modern-day revolution, at the global level, has manifested itself in the form of many innovations and breakthroughs and giant leaps in internetworking technology. With these new opportunities, people can now transcend the barriers of time and distance with the Internet's speed.

With the inception of the Web, organizations and individuals are more and more making use of it to create new business ventures. The WWW is not only a definitive source of information, but an astounding business opportunity as well. People throughout the world are venturing out onto the Web for buying and selling goods and services. The Web has indeed proved to be a boon to business, drawing its power from the flow of easy and instantaneous transactions, worldwide. Online business is thriving and more and more corporate companies are joining the fray of electronic transactions. Thus ushered in, the era of 'E-commerce' has established a significant synergy between the use of digital information and computerized business.

E-commerce refers to aspects of online business involving exchanges among customers, business partners and vendors. E-commerce has increased the speed and ease with which business can be transacted today, resulting in intense competition between enterprises. Companies are at the crossroads, with just two vistas ahead of them—either go online or go out of business. Once the choice of online business is made, further roadblocks are encountered: which business model to adopt; which management strategies and tactics will make business successful? How to explore opportunities, understand limitations, and issues? The solution is to gain a deeper insight into the e-commerce strategies.

This is the aim of my substantially revised **third edition** of the book—to provide students with a thorough overview of e-commerce. In its course, students will learn everything about e-commerce—from developing online strategies for launching and organizing a site, to planning and overseeing the transaction systems. From a business strategy perspective, the book also describes the technologies that help businessmen in their e-commerce endeavours.

The book begins with the history of e-commerce, in particular, it focuses on e-transition challenges for Indian corporates. The recent as well as the projected statistics concerning the growth of the Internet are described. Some case studies emphasize the crucial issues that Indian corporates face while e-transforming themselves.

Chapter 2 is an analysis of different business transaction models based on transaction types and parties. Such an analysis is critical for creating the underlying e-business infrastructure. The business models of a few Indian corporates are described in case studies. The focus of Chapter 3 is on Web-enabled technologies and their growing relevance to e-business. The

terms related to networking, such as routers, protocols, servers, search engines, and methods of networking, and usage of networking languages have been thoroughly elucidated with sufficient examples, tables, and figures.

Chapter 4 defines and discusses the concepts and strategies of e-marketing. Real-world examples of popular websites, the techniques involved in Web-browsing and conducting business on the Internet are included to enhance the reader's interest in e-commerce.

An important issue of concern is Internet security. There is a definitive requirement to conduct secure and safe transactions over the Web. Chapters 5 and 6 throw light on e-security and e-payment respectively. Features related to e-security such as firewall protection and virus attacks, and those related to e-payment techniques including electronic tokens, digital currencies, and digital signature are all analyzed in great detail.

Chapters 7 and 8 are directed towards corporations. How to create customers and maintain a good relationship with them should be the prime concern of any enterprise conducting online business. Chapter 7 discusses the tactics for creating and maintaining customer relations. It focuses on the provisions required for maintaining the quality of service for customers. Customer satisfaction being the key to business success, requires innovative strategies for the establishment of personal relationships with customers.

It is important to keep online business alive by maintaining an easy and smooth flow of goods and information. Chapter 8 provides a deep insight into this aspect of e-business, i.e. e-supply chain management.

Chapter 9 is an overview of the e-strategies including knowledge management. This chapter highlights the importance of data warehousing and data mining in an organization. Procedures for implementing e-business and strengthening value chain have also been clearly discussed. A case study on knowledge management is included as well.

Chapter 10 is exclusively devoted to 'mobile-commerce', the upcoming e-commerce trend enabled by wireless communications. Mobile computing technologies and Web-based applications which enable mobile business, are clearly explained in this chapter.

Having gained a good knowledge about e-commerce, we reach the final step—the art of Web designing. Chapter 11 of the book describes the features of Web designing and offers useful tips on creating a good e-commerce site.

The realm of digital transmission not limited by geography, i.e. cyberspace, is posing significant challenges to the legal system. These issues are explored in the concluding Chapter 12 which deals with legal and ethical issues involving the use of the Internet.

This book is suitable for students of Management and Business Administration, Computer Applications, and Information Technology. It will also be useful to managers, corporate planners and technical professionals in their endeavours to set up online business processes.

I wish to thank various people at Prentice-Hall of India who devoted their precious time and energy and supervised the overall project and managed excellently to bring out this third edition on time.

P.T. JOSEPH, S.J.

CHAPTER 1

History of E-commerce and Indian Business Context

Electronic commerce (e-commerce) has become a buzzword for businesses over the past few years, with increased awareness about the use of computer and communications technologies to simplify business procedures and increase efficiency. Combining a range of processes, such as Electronic Data Interchange (EDI), electronic mail (e-mail), World Wide Web (WWW), and Internet applications, e-commerce provides ways to exchange information between individuals, companies, and countries, but most important of all, between computers. More simply put, e-commerce is the movement of business onto the World Wide Web. This movement has been broken up into two main sectors: **business-to-business (B2B)** and **business-to-consumer (B2C)**. E-commerce comprises core business processes of buying, selling goods, services, and information over the Internet. The e-commerce information available on the Internet is huge and still growing.

Unfortunately, the political structures of the world have not kept up with the Internet technology, and thus business internationally presents a number of challenges. Currency conversions, tariffs, import and export restrictions, local business customs, and the laws of each country in which a trading partner resides can make international electronic commerce difficult.

Many of the international issues that arise, relate to legal, tax, and privacy concerns. Each country has the right to pass laws and levy taxes on businesses that operate within its jurisdiction. European countries have strict laws that limit the collection and use of personal information that companies gather in the course of doing business with consumers. Even within the United States, the individual states and countries have the power to levy sales taxes on goods and services. In other countries, national sales and value-added taxes are imposed on an even broader list of business activities.

E-commerce is already very big and it is going to get much bigger. But the actual value of transactions currently concluded online is dwarfed by the extraordinary influence the Internet is exerting over purchases carried out in the offline world. That influence is becoming an integral part of e-commerce.

When the technology bubble burst in 2000, the crazy valuations for online companies vanished with it, and many businesses folded up. The survivors plugged on as best they could, encouraged by the growing number of Internet users. Now valuations are rising again and some of the dotcoms are making real profits, but the business world has become much more cautious about the Internet's potential. An astonishing thing is that the wild predictions made at the height of the boom, namely that vast chunks of the world economy would move into cyberspace, are in one way or the other coming true.

According to America's department of commerce, online retail sales in the US market in 2007 was about 130 billion[1]. But the commerce department's figures deal with only part of the retail industry. For instance, they exclude online travel services, financial services, ticket sales agencies, pornography (a $2 billion business in America in 2003), online dating and a host of other activities, from tracing ancestors to gambling (worth perhaps $6 billion worldwide). The commerce department's figures include the fees earned by internet auction sites, but not the value of goods that are sold an astonishing $7 billion worth of trade was done in 2006 on e-Bay, nor by definition, do they include the billions of dollars worth of goods bought and sold by businesses connecting to each other over the internet. Some of these B2B services are proprietary for example, Wal Mart tells its suppliers that they must use its own system if they want to be part of its annual turnover of $350 billion.

The internet is profoundly changing consumer behaviour. One in five customers walking into a Sears department store in America to buy an electrical appliance will have researched their purchase online—and most will know down to a dime what they intend to pay. More surprisingly, three out of four Americans start shopping for new cars online, even though most end up buying them from traditional dealers. The difference is that these customers come to the showroom armed with information about the car and the best available deals. Sometimes they even have computer printouts identifying the particular vehicle from the dealer's stock that they want to buy.

People seem to enjoy shopping on the internet, if high customer-satisfaction scores are any guide. Websites are doing ever more and cleverer things to serve and entertain their customers, and seem set to take a much bigger share of people's overall spending in the future. This has enormous implications for business. A company that neglects its website may be committing commercial suicide. A website is increasingly becoming the gateway to a company's brand, products and services—even if the firm does not sell online. A useless website suggests a useless company, and a rival is only a mouse-click away. But even the coolest website will be lost in cyberspace if people cannot find it, so companies have to ensure that they appear high up in internet search results.

The other way to get noticed online is to offer goods and services through one of the big sites that already get a lot of traffic. Ebay, Yahoo! and Amazon are becoming huge trading platforms for other companies. But to take part, a company's products have to stand up to intense price competition. People check online prices, compare them with those in their local high street and may well take a peek at what customers in other countries are paying. Even if websites are prevented from shipping their goods abroad, there are plenty of web-based entrepreneurs ready to oblige.

[1] www.census.gov/mrts

Early Business Information Interchange Efforts

The emergence of large business organizations in the late 1800s and early 1900s triggered the need to create and maintain formal records of business transactions. In the 1950s, companies began to use computers to store and process internal transaction records, but the information flows between businesses continued to be on paper. Purchase orders, invoices, bills of lading, cheques, remittance advices, and other standard forms were used to document transactions.

The process of using a person or a computer to generate a paper form, mailing that form, and then having another person enter the data into the trading partner's computer was slow, inefficient, expensive, redundant, and unreliable. By the 1960s, businesses that engaged in large volumes of transactions had begun exchanging transaction information on punched cards or magnetic tape. Advances in data communications technology eventually allowed trading partners to transfer data over telephone lines instead of shipping punched cards or magnetic tapes to each other.

Although these information transfer agreements between trading partners increased efficiency and reduced errors, they were not an ideal solution. Since the translation programs that one trading partner wrote usually would not work for other trading partners, each company participating in this information exchange had to make a substantial investment in computing infrastructure. Only large trading partners could afford this investment, and even those companies had to have a significant number of transactions to justify the cost. Smaller- or lower-volume trading partners could not afford to participate in the benefits of these paper-free exchanges.

In 1968, a number of freight and shipping companies joined together to form the Transportation Data Coordinating Committee (TDCC), which was charged with exploring ways to reduce the paperwork burden that shippers and carriers faced. The TDCC created a standardized information set that included all the data elements that shippers commonly included in bills of lading, freight invoices, shipping manifests, and other paper forms. Instead of printing a paper form, shippers could transform information about shipments into a computer file that conformed to the TDCC standard format. The shipper could electronically transmit that computer file to any freight company that had adopted the TDCC format. The freight company translated the TDCC format into data it could use in its own information systems. The savings from not printing and handling forms, not entering the data twice, and not having to worry about error-correction procedures were significant for most shippers and freight carriers.

After a decade of fragmented attempts at setting broader EDI standards, a number of industry groups and several large companies decided to make a major effort to create a set of cross-industry standards for electronic components, mechanical equipment, and other widely used items. The American National Standards Institute (ANSI) has been the coordinating body for standards in the United States since 1918. ANSI does not set standards, though it creates procedures and organizational standards for the development of national standards and accredites committees that follow those procedures.

In 1979, ANSI chartered a new committee to develop uniform EDI standards. This committee is called the *Accredited Standards Committee X12* (ASC X12). The committee meets three times a year to develop and maintain EDI standards. The committee and its subcommittees include information technology professionals from over 800 businesses and other organizations. Membership is open to organizations and individuals who have an interest in the standards. The ASC X12 standard has benefitted from the participation of members from a wide variety of industries. This standard currently includes specifications for several hundred transaction sets, which are the names of the formats for specific business data interchanges.

In 1987, the United Nations published its first standards under the title *EDI for Administration, Commerce, and Transport* (EDIFACT, or UN/EDIFACT). As the Internet gained prominence as a tool for conducting business, the trading partners who had been using EDI began to view the Internet as a potential replacement for the expensive leased lines and dial-up connections they had been using. Companies that were unable to afford EDI began to look at the Internet as an enabling technology that might get them back in the game of selling to a large number of customers who demanded EDI capabilities of their suppliers.

The major hurdles to conducting EDI over the Internet initially were general concerns about security and the Internet's general inability to provide audit logs and third-party verification of message transmission and delivery. The lack of third-party verification continues to be an issue, since the Internet has no built-in facility for that. Because EDI transactions are business contracts and often involve large amounts of money, the issue of non-repudiation causes significant concern.

Emergence of the Internet

The role of the Internet in the evolution of e-commerce has been so crucial that the history of e-commerce will remain incomplete without the inclusion of the history of the Internet.

Using the Internet, you can communicate with other people throughout the world by means of e-mail, read online versions of newspapers, magazines, academic journals, and books, join discussion groups on almost any conceivable topic, participate in games and simulations, and obtain free computer software. In recent years, the Internet has allowed commercial enterprises to connect with one another and with customers. Today, all kinds of businesses provide information about their products and services on the Internet. Many of these businesses use the Internet to market and sell their products and services. The part of the Internet known as the World Wide Web, or, more simply, the Web, is a subset of the computers on the Internet that are connected to each other in a specific way that makes those computers and their contents easily accessible to each other. The most important thing about the Web is that it includes an easy-to-use standard interface. This interface makes it possible for people who are not computer experts to use the World Wide Web to access a variety of Internet resources.

In the early 1960s, the US Department of Defense became very much concerned about the possible effects of a nuclear attack on its computing facilities. The Defense Department realized the need for powerful computers for coordination and control. The powerful computers

of that time were all large mainframe computers. So the Defense Department began examining ways to connect these computers to each other and also to weapon installations that were distributed all over the world. The Defense Department agency, charged with this task, hired many of the best communications technology researchers and funded research at leading universities and institutes to explore the task of creating a worldwide network that could remain operational even if parts of the network were destroyed by enemy military action or sabotage. These researchers worked to devise ways to build networks that could operate independently—that is, networks that would not require a central computer to control network operations.

The world's telephone companies were the early models for networked computers, because early networks of computers used leased telephone company lines for their connections. Telephone company systems of that time established a single connection between sender and receiver for each telephone call, and that connection carried all the data along a single path. When a company wanted to connect computers it owned at two different locations, it placed a telephone call to establish the connection and then connected one computer to each end of that single connection.

The Defense Department was concerned about the inherent risk of this single-channel method for connecting computers. So its researchers developed a different method of sending information through multiple channels. In this method, files and messages are broken into packets and labelled electronically with codes about their origin and destination. The 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. Each computer that an individual packet encounters on its trip through the network, determines the best way to move the packet forward to its destination.

In 1969, these Defense Department researchers used this network model to connect four computers—one each at the University of California at Los Angeles, SRI International, the University of California at Santa Barbara, and the University of Utah. During the subsequent years, many researchers in the academic community connected to this network and contributed to technological developments that increased the speed and efficiency with which the network operated. At the same time, researchers at other universities were creating their own networks using similar technologies.

The upshot was the Internet Protocol (IP), which enabled any number of computer networks to link up and act as one—and eventually it was given the name, the Internet. This meant that the communication network among the computers was not dependent on any single computer to operate, and so could not be shut down by destroying one or even several of the computers. Thus, the Defense Department got what it wanted. And a new, growing system of computer networks was spawned.

Although the goals of the Defense Department network were still to control weapons systems and transfer research files, other uses of this vast network began to appear in the early 1970s. In 1972, a researcher wrote a program that could send and receive messages over the network. Thus was born the e-mail which came to be widely used very quickly. The number of network users in the military and education research communities continued to grow. Many of these new participants used the networking technology to transfer files and access remote computers. The network software included two tools for performing these

tasks. File Transfer Protocol (FTP) enabled users to transfer files between computers, and Telnet let users log on to their computer accounts from remote sites. Both FTP and Telnet are still widely used on the Internet for file transfers and remote logins, even though more advanced techniques are now available that allow multimedia transmissions such as real-time audio and video clips.

The first e-mail mailing lists also appeared on these networks. In 1979, a group of students and programmers at the Duke University and the University of North Carolina started Usenet, an abbreviation for Users News Network. Usenet allows anyone who connects to the network to read and post articles on a variety of subjects. The Defense Department's networking software became more widely used as academic and research institutes realized the benefits of having a common communications network. The explosion of personal computer use during that time also helped more people become comfortable with computing. In the late 1980s, these independent academic and research networks merged into one infrastructure—the *Internet* that links today hundreds and thousands of networks to one another.

Commercial Use of the Internet

As personal computers became more powerful, affordable, and available during the 1980s, companies increasingly used them to construct their own internal networks. Although these networks included e-mail software that enabled the employees to send messages, businesses wanted their employees to be able to communicate with people outside their corporate networks for promoting business. The Defense Department network and most of the other academic networks that had teamed up with it were receiving funding from the National Science Foundation (NSF). The NSF prohibited commercial network traffic on its networks and so businesses turned to commercial e-mail service providers to handle their e-mail needs. Larger firms built their own networks that used leased telephone lines to connect field offices to corporate headquarters.

In 1989, the NSF permitted two commercial e-mail services, MCI Mail and CompuServe to establish limited connections to the Internet for the sole purpose of exchanging e-mail transmissions with users of the Internet. These connections allowed commercial enterprises to send e-mail directly to Internet addresses and allowed members of the research and education communities on the Internet to send e-mail directly to MCI Mail and CompuServe addresses. The NSF justified this limited commercial use of the Internet as a service that would primarily benefit the Internet's non-commercial users.

Growth of the Internet

In 1991, the NSF further eased its restrictions on Internet commercial activity and began implementing plans to privatize the Internet. The privatization of the Internet was substantially completed in 1995, when the NSF turned over the operation of the main Internet connections

to a group of privately owned companies. The new structure of the Internet was based on four Network Access Points (NAPs), each operated by a separate company. These companies, which are known as *network-access providers*, sell Internet access rights directly to larger customers and indirectly to smaller firms through other companies, called *Internet Service Providers* (ISPs).

The Internet was a phenomenon that truly sneaked into an unsuspecting world. The researchers who had been so involved in the creation and growth of the Internet just accepted it as a part of their working environment. People outside the research community were largely unaware of the potential offered by a large interconnected set of computer networks.

Within 30 years, the Internet became one of the most amazing technological and social accomplishments of the 20th century. Millions of people are using today this complex, interconnected network of computers. These computers run thousands of different software packages. The computers are located in almost every country of the world. Every year, billions of dollars change hands over the Internet in exchange for all kinds of products and services. All of this activity occurs with no central coordination point or control, which is especially interesting, given that the Internet began as a way for the military to maintain control while under attack.

The opening of the Internet to business activities helped increase the Internet's growth dramatically; however, there was another development that worked hand in hand with the commercialization of the Internet to spur its growth. That development was the World Wide Web (WWW).

Emergence of the World Wide Web

The web is more a way of thinking about and organizing information storage and retrieval than a technology. As such, its history goes back to many years. Two important innovations played key roles in making the Internet easier to use and more accessible to people who were not research scientists. These two innovations were *Hypertext* and *Graphical User Interfaces* (GUIs).

Origins of the Web

In 1945, Vannevar Bush, who was director of the US Office of Scientific Research and Development, wrote an Atlantic Monthly article about ways that scientists could apply the skills they learned during World War II to peacetime activities. The article included a number of visionary ideas about future uses of technology to organize and facilitate efficient access to information. Bush speculated that engineers would eventually build a machine that he called the *Memex* (a memory extension device), that would store all—a person's books, records, letters, and research results—on microfilm. Vannevar Bush described a system for associatively linking information in his July 1945 article in *The Atlantic Monthly*, 'As We May Think'.[2]

Hypertext, as implemented on the Web, however, has its origins in the start of the electronic computer age, when ideas about associative linking could be married with the

[2] http://www.isg.sfu.ca/~duchier/misc/vbush

possibilities of automated storage-and-retrieval systems. Douglas Engelbart, who also invented the computer mouse, created the first experimental hypertext system on one of the largest computers of the 1960s. In 1965, Ted Nelson coined the term *hypertext* to describe a text that is not constrained to be sequential. Hypertext, as described by Nelson, links documents to form a web of relationships that draws on the possibilities for extending and augmenting the meaning of a 'flat' piece of text with links to other texts. Hypertext therefore is more than just footnotes that serve as commentary or further information in a text. Instead, it extends the structure of ideas by making 'chunks' of ideas available for inclusion in many parts of multiple texts. Nelson also coined the term *hypermedia*, which is a hypertext not constrained to be text. It can include the combination of text, pictures, graphics, sound, and movies.

The ideas of Vannevar Bush, Ted Nelson and others, about information systems, showed up in another project in the late 1980s. In March 1989, Tim Berners-Lee, a researcher at the *Conseil Europeen pour la Recherche Nucleaire* (CERN), the European Laboratory for Particle Physics in Geneva, Switzerland, proposed a hypertext system to enable efficient information sharing for members of the high-energy physics community. This proposal, called *HyperText* and *CERN*, was circulated for comments. The important components of the proposal follow:

- A user interface that would be consistent with all platforms and that would allow users to access information from many different computers.
- A scheme for this interface to access a variety of document types and information protocols.
- A provision for universal access, which would allow any user on the network to access any information.

In October of 1991, a gateway from the Web to Wide Area Information Server (WAIS) software was completed. On 15 January 1991, the WWW interface became publicly available from CERN, and the CERN team demonstrated the Web to researchers internationally throughout the rest of the year.

By 1993, there were about 50 Web servers in existence, and the first graphical interfaces (called *clients* or *browsers*) for the X Window System and the Macintosh became available in Switzerland. Until 1993, most of the development of Web technologies came out of CERN. In early 1993, however, a young undergraduate, Marc Andreessen, at the University of Illinois at Urbana-Champaign shifted the stage to the United States. Working on a project for the National Center for Supercomputing Applications (NCSA), Andreessen led a team that developed an X Window System browser for the Web and called it *Mosaic*. Marc Andreessen and his colleagues then left NCSA in March 1994 to form a company that later came to be known as Netscape Communications Corporation. By May 1994, the interest in the Web was so intense that the first international conference on the WWW, held in Geneva, overflowed with attendees. By mid 1994, it was clear to the original developers at CERN that the stable development of the Web should fall under the guidance of an international organization. In July, the Massachusetts Institute of Technology (MIT) and CERN announced the World Wide Web Organization (which was later known as the World Wide Web Consortium, or W3C). Today, the W3C guides the technical development and standards for the evolution of the Web.

In 1995, the Web development was marked by rapid commercialization and technical change. Netscape Communication's browser, called *Netscape Navigator* (nicknamed *Mozilla*) continued to include more extensions of the Hypertext Markup Language (HTML), and at the same time the issues of security for commercial cash transactions garnered much attention. By May 1995, there were more than 15,000 known public Web servers—a ten-fold increase over the number that existed only a year before.

Hypertext Transfer Protocol (HTTP) is the Internet protocol responsible for transferring and displaying Web pages. HTTP runs in the application layer of the Transmission Control Protocol/Internet Protocol (TCP/IP) model. Like the other Internet protocols, HTTP employs the client-server model in which a user's Web browser opens an HTTP session and sends a request to the remote server for a Web page. In response, the server creates an HTTP response message that is sent back to the user's Web browser. The response contains the page displayed by the client's browser. After the client determines that the message it received is correct, the TCP/IP connection is closed and the HTTP session ends. The process is demonstrated in Figure 1.1.

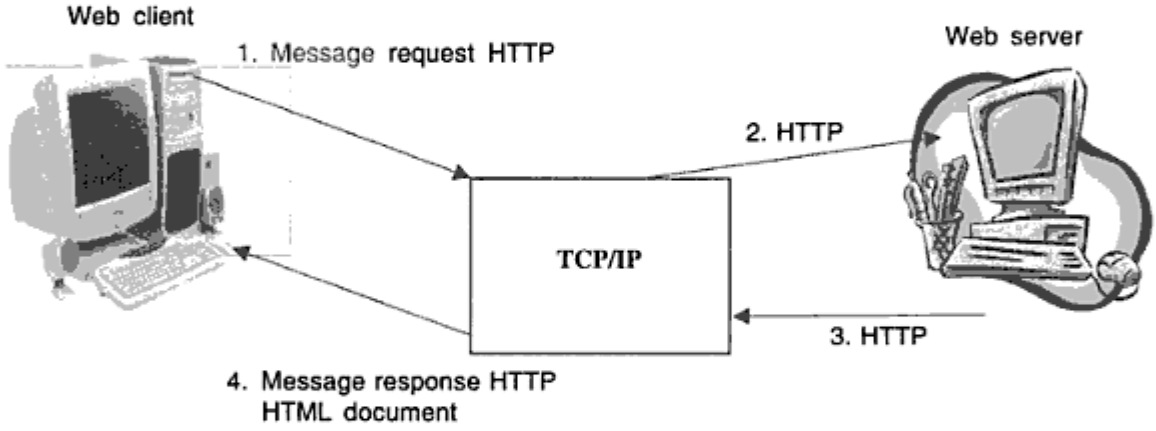

Fig. 1.1 Client-server architecture using HTTP.

The Milestones[3]

1988	—	The number of hosts on the net became over 60,000.
1989	—	Over 10,000 hosts on the net were registered.
1991	—	The World Wide Web (WWW) was created by CERN in Switzerland.
1992	—	One million hosts on the net were found.
1993	—	The InterNic is created to handle domain name registration.
1995	—	There were a total of 6.6 million hosts or computers on the Internet.
July 1996	—	An estimated 12.8 million hosts, 212,155 web sites and about 25 million users of the web. About 90% of the users of the web are in the United States.

[3] http://www.w3.org/History

July 1997 — 1.3 million domain names registered.
December 1997 — 22 million servers, 40 million users on the WWW.
2000 — 110 million users and 72 million Domains Names.
2003 — 802.2 million users 233 million hosts.
2004 — 817 million users.
2005 — 1018 million users.
2006 — 1093 million users.
2007 — 1350 million users.

The number of world wide web users continues to double in size about every 12 to 15 months. All of these have had an impact. Perhaps the most significant factor, though, is that the Internet offers a range of messaging techniques, all of which work rapidly. The standards used to make it work are not all ratified by international standards bodies, but they do work. The factor of not having to wait for standards to be agreed has surely accelerated the growth in the number of Internet users.

An equally significant factor is that, with the existing level of awareness of e-commerce practices, companies can easily identify the Internet as a means of exchanging business data. The Internet has some drawbacks with regard to security and data integrity.

The growth of web sites over the years[4] is shown in Table 1.1. The corresponding graph is found in Figure 1.2.

TABLE 1.1
GROWTH OF THE NUMBER OF HOSTS OVER THE YEARS

Year	*Number of hosts advertised in the DNS*
1993	1,313,000
1994	2,217,000
1995	4,852,000
1996	9,472,000
1997	16,146,000
1998	29,670,000
1999	43,230,000
2000	72,398,092
2001	109,574,429
2002	147,344,723
2003	171,638,297
2004	317,646,084
2005	353,284,187
2006	394,991,609
2007	433,193,199
2008	500,000,000

[4] http://www.isc.org

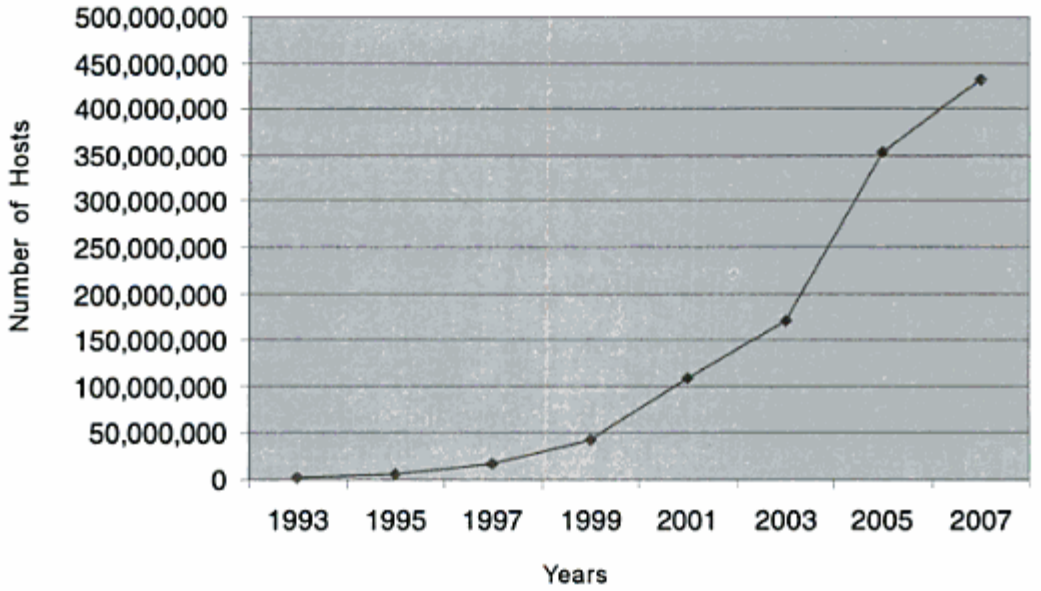

Fig. 1.2 Growth in the number of Internet hosts over the years.

Advantages of E-commerce

Some of the key strengths of using the Internet for businesses include the following:

1. ***24 × 7 operation.*** Round-the-clock operation is an expensive proposition in the 'brick-and-mortar' world, while it is natural in the 'click-and-conquer' world.

2. ***Global reach.*** The net being inherently global, reaching global customers is relatively easy on the net compared to the world of bricks.

3. ***Cost of acquiring, serving and retaining customers.*** It is relatively cheaper to acquire new customers over the net; thanks to 24 × 7 operation and its global reach. Through innovative tools of 'push' technology, it is also possible to retain customers' loyalty with minimal investments.

4. ***An extended enterprise is easy to build.*** In today's world every enterprise is part of the 'connected economy'; as such, you need to extend your enterprise all the way to your suppliers and business partners like distributors, retailers and ultimately your end-customers. The Internet provides an effective (often less expensive) way to extend your enterprise beyond the narrow confines of your own organization. Tools like enterprise resource planning (ERP), supply chain management (SCM) and customer relationship management (CRM), can easily be deployed over the Internet, permitting amazing efficiency in time needed to market, customer loyalty, on-time delivery and eventually profitability.

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Contents

Preface

We are in the age of knowledge and consequently in the midst of an electronic revolution, the impact of which on the economy is much more profound than that caused by the Industrial revolution. This modern-day revolution, at the global level, has manifested itself in the form of many innovations and breakthroughs and giant leaps in internetworking technology. With these new opportunities, people can now transcend the barriers of time and distance with the Internet's speed.

With the inception of the Web, organizations and individuals are more and more making use of it to create new business ventures. The WWW is not only a definitive source of information, but an astounding business opportunity as well. People throughout the world are venturing out onto the Web for buying and selling goods and services. The Web has indeed proved to be a boon to business, drawing its power from the flow of easy and instantaneous transactions, worldwide. Online business is thriving and more and more corporate companies are joining the fray of electronic transactions. Thus ushered in, the era of 'E-commerce' has established a significant synergy between the use of digital information and computerized business.

E-commerce refers to aspects of online business involving exchanges among customers, business partners and vendors. E-commerce has increased the speed and ease with which business can be transacted today, resulting in intense competition between enterprises. Companies are at the crossroads, with just two vistas ahead of them—either go online or go out of business. Once the choice of online business is made, further roadblocks are encountered: which business model to adopt; which management strategies and tactics will make business successful? How to explore opportunities, understand limitations, and issues? The solution is to gain a deeper insight into the e-commerce strategies.

This is the aim of my substantially revised **third edition** of the book—to provide students with a thorough overview of e-commerce. In its course, students will learn everything about e-commerce—from developing online strategies for launching and organizing a site, to planning and overseeing the transaction systems. From a business strategy perspective, the book also describes the technologies that help businessmen in their e-commerce endeavours.

The book begins with the history of e-commerce, in particular, it focuses on e-transition challenges for Indian corporates. The recent as well as the projected statistics concerning the growth of the Internet are described. Some case studies emphasize the crucial issues that Indian corporates face while e-transforming themselves.

Chapter 2 is an analysis of different business transaction models based on transaction types and parties. Such an analysis is critical for creating the underlying e-business infrastructure. The business models of a few Indian corporates are described in case studies. The focus of Chapter 3 is on Web-enabled technologies and their growing relevance to e-business. The

terms related to networking, such as routers, protocols, servers, search engines, and methods of networking, and usage of networking languages have been thoroughly elucidated with sufficient examples, tables, and figures.

Chapter 4 defines and discusses the concepts and strategies of e-marketing. Real-world examples of popular websites, the techniques involved in Web-browsing and conducting business on the Internet are included to enhance the reader's interest in e-commerce.

An important issue of concern is Internet security. There is a definitive requirement to conduct secure and safe transactions over the Web. Chapters 5 and 6 throw light on e-security and e-payment respectively. Features related to e-security such as firewall protection and virus attacks, and those related to e-payment techniques including electronic tokens, digital currencies, and digital signature are all analyzed in great detail.

Chapters 7 and 8 are directed towards corporations. How to create customers and maintain a good relationship with them should be the prime concern of any enterprise conducting online business. Chapter 7 discusses the tactics for creating and maintaining customer relations. It focuses on the provisions required for maintaining the quality of service for customers. Customer satisfaction being the key to business success, requires innovative strategies for the establishment of personal relationships with customers.

It is important to keep online business alive by maintaining an easy and smooth flow of goods and information. Chapter 8 provides a deep insight into this aspect of e-business, i.e. e-supply chain management.

Chapter 9 is an overview of the e-strategies including knowledge management. This chapter highlights the importance of data warehousing and data mining in an organization. Procedures for implementing e-business and strengthening value chain have also been clearly discussed. A case study on knowledge management is included as well.

Chapter 10 is exclusively devoted to 'mobile-commerce', the upcoming e-commerce trend enabled by wireless communications. Mobile computing technologies and Web-based applications which enable mobile business, are clearly explained in this chapter.

Having gained a good knowledge about e-commerce, we reach the final step—the art of Web designing. Chapter 11 of the book describes the features of Web designing and offers useful tips on creating a good e-commerce site.

The realm of digital transmission not limited by geography, i.e. cyberspace, is posing significant challenges to the legal system. These issues are explored in the concluding Chapter 12 which deals with legal and ethical issues involving the use of the Internet.

This book is suitable for students of Management and Business Administration, Computer Applications, and Information Technology. It will also be useful to managers, corporate planners and technical professionals in their endeavours to set up online business processes.

I wish to thank various people at Prentice-Hall of India who devoted their precious time and energy and supervised the overall project and managed excellently to bring out this third edition on time.

P.T. JOSEPH, S.J.

CHAPTER 1

History of E-commerce and Indian Business Context

Electronic commerce (e-commerce) has become a buzzword for businesses over the past few years, with increased awareness about the use of computer and communications technologies to simplify business procedures and increase efficiency. Combining a range of processes, such as Electronic Data Interchange (EDI), electronic mail (e-mail), World Wide Web (WWW), and Internet applications, e-commerce provides ways to exchange information between individuals, companies, and countries, but most important of all, between computers. More simply put, e-commerce is the movement of business onto the World Wide Web. This movement has been broken up into two main sectors: **business-to-business (B2B)** and **business-to-consumer (B2C)**. E-commerce comprises core business processes of buying, selling goods, services, and information over the Internet. The e-commerce information available on the Internet is huge and still growing.

Unfortunately, the political structures of the world have not kept up with the Internet technology, and thus business internationally presents a number of challenges. Currency conversions, tariffs, import and export restrictions, local business customs, and the laws of each country in which a trading partner resides can make international electronic commerce difficult.

Many of the international issues that arise, relate to legal, tax, and privacy concerns. Each country has the right to pass laws and levy taxes on businesses that operate within its jurisdiction. European countries have strict laws that limit the collection and use of personal information that companies gather in the course of doing business with consumers. Even within the United States, the individual states and countries have the power to levy sales taxes on goods and services. In other countries, national sales and value-added taxes are imposed on an even broader list of business activities.

E-commerce is already very big and it is going to get much bigger. But the actual value of transactions currently concluded online is dwarfed by the extraordinary influence the Internet is exerting over purchases carried out in the offline world. That influence is becoming an integral part of e-commerce.

When the technology bubble burst in 2000, the crazy valuations for online companies vanished with it, and many businesses folded up. The survivors plugged on as best they could, encouraged by the growing number of Internet users. Now valuations are rising again and some of the dotcoms are making real profits, but the business world has become much more cautious about the Internet's potential. An astonishing thing is that the wild predictions made at the height of the boom, namely that vast chunks of the world economy would move into cyberspace, are in one way or the other coming true.

According to America's department of commerce, online retail sales in the US market in 2007 was about 130 billion[1]. But the commerce department's figures deal with only part of the retail industry. For instance, they exclude online travel services, financial services, ticket sales agencies, pornography (a $2 billion business in America in 2003), online dating and a host of other activities, from tracing ancestors to gambling (worth perhaps $6 billion worldwide). The commerce department's figures include the fees earned by internet auction sites, but not the value of goods that are sold an astonishing $7 billion worth of trade was done in 2006 on e-Bay, nor by definition, do they include the billions of dollars worth of goods bought and sold by businesses connecting to each other over the internet. Some of these B2B services are proprietary for example, Wal Mart tells its suppliers that they must use its own system if they want to be part of its annual turnover of $350 billion.

The internet is profoundly changing consumer behaviour. One in five customers walking into a Sears department store in America to buy an electrical appliance will have researched their purchase online—and most will know down to a dime what they intend to pay. More surprisingly, three out of four Americans start shopping for new cars online, even though most end up buying them from traditional dealers. The difference is that these customers come to the showroom armed with information about the car and the best available deals. Sometimes they even have computer printouts identifying the particular vehicle from the dealer's stock that they want to buy.

People seem to enjoy shopping on the internet, if high customer-satisfaction scores are any guide. Websites are doing ever more and cleverer things to serve and entertain their customers, and seem set to take a much bigger share of people's overall spending in the future. This has enormous implications for business. A company that neglects its website may be committing commercial suicide. A website is increasingly becoming the gateway to a company's brand, products and services—even if the firm does not sell online. A useless website suggests a useless company, and a rival is only a mouse-click away. But even the coolest website will be lost in cyberspace if people cannot find it, so companies have to ensure that they appear high up in internet search results.

The other way to get noticed online is to offer goods and services through one of the big sites that already get a lot of traffic. Ebay, Yahoo! and Amazon are becoming huge trading platforms for other companies. But to take part, a company's products have to stand up to intense price competition. People check online prices, compare them with those in their local high street and may well take a peek at what customers in other countries are paying. Even if websites are prevented from shipping their goods abroad, there are plenty of web-based entrepreneurs ready to oblige.

[1] www.census.gov/mrts

Early Business Information Interchange Efforts

The emergence of large business organizations in the late 1800s and early 1900s triggered the need to create and maintain formal records of business transactions. In the 1950s, companies began to use computers to store and process internal transaction records, but the information flows between businesses continued to be on paper. Purchase orders, invoices, bills of lading, cheques, remittance advices, and other standard forms were used to document transactions.

The process of using a person or a computer to generate a paper form, mailing that form, and then having another person enter the data into the trading partner's computer was slow, inefficient, expensive, redundant, and unreliable. By the 1960s, businesses that engaged in large volumes of transactions had begun exchanging transaction information on punched cards or magnetic tape. Advances in data communications technology eventually allowed trading partners to transfer data over telephone lines instead of shipping punched cards or magnetic tapes to each other.

Although these information transfer agreements between trading partners increased efficiency and reduced errors, they were not an ideal solution. Since the translation programs that one trading partner wrote usually would not work for other trading partners, each company participating in this information exchange had to make a substantial investment in computing infrastructure. Only large trading partners could afford this investment, and even those companies had to have a significant number of transactions to justify the cost. Smaller- or lower-volume trading partners could not afford to participate in the benefits of these paper-free exchanges.

In 1968, a number of freight and shipping companies joined together to form the Transportation Data Coordinating Committee (TDCC), which was charged with exploring ways to reduce the paperwork burden that shippers and carriers faced. The TDCC created a standardized information set that included all the data elements that shippers commonly included in bills of lading, freight invoices, shipping manifests, and other paper forms. Instead of printing a paper form, shippers could transform information about shipments into a computer file that conformed to the TDCC standard format. The shipper could electronically transmit that computer file to any freight company that had adopted the TDCC format. The freight company translated the TDCC format into data it could use in its own information systems. The savings from not printing and handling forms, not entering the data twice, and not having to worry about error-correction procedures were significant for most shippers and freight carriers.

After a decade of fragmented attempts at setting broader EDI standards, a number of industry groups and several large companies decided to make a major effort to create a set of cross-industry standards for electronic components, mechanical equipment, and other widely used items. The American National Standards Institute (ANSI) has been the coordinating body for standards in the United States since 1918. ANSI does not set standards, though it creates procedures and organizational standards for the development of national standards and accredites committees that follow those procedures.

In 1979, ANSI chartered a new committee to develop uniform EDI standards. This committee is called the *Accredited Standards Committee X12* (ASC X12). The committee meets three times a year to develop and maintain EDI standards. The committee and its subcommittees include information technology professionals from over 800 businesses and other organizations. Membership is open to organizations and individuals who have an interest in the standards. The ASC X12 standard has benefitted from the participation of members from a wide variety of industries. This standard currently includes specifications for several hundred transaction sets, which are the names of the formats for specific business data interchanges.

In 1987, the United Nations published its first standards under the title *EDI for Administration, Commerce, and Transport* (EDIFACT, or UN/EDIFACT). As the Internet gained prominence as a tool for conducting business, the trading partners who had been using EDI began to view the Internet as a potential replacement for the expensive leased lines and dial-up connections they had been using. Companies that were unable to afford EDI began to look at the Internet as an enabling technology that might get them back in the game of selling to a large number of customers who demanded EDI capabilities of their suppliers.

The major hurdles to conducting EDI over the Internet initially were general concerns about security and the Internet's general inability to provide audit logs and third-party verification of message transmission and delivery. The lack of third-party verification continues to be an issue, since the Internet has no built-in facility for that. Because EDI transactions are business contracts and often involve large amounts of money, the issue of non-repudiation causes significant concern.

Emergence of the Internet

The role of the Internet in the evolution of e-commerce has been so crucial that the history of e-commerce will remain incomplete without the inclusion of the history of the Internet.

Using the Internet, you can communicate with other people throughout the world by means of e-mail, read online versions of newspapers, magazines, academic journals, and books, join discussion groups on almost any conceivable topic, participate in games and simulations, and obtain free computer software. In recent years, the Internet has allowed commercial enterprises to connect with one another and with customers. Today, all kinds of businesses provide information about their products and services on the Internet. Many of these businesses use the Internet to market and sell their products and services. The part of the Internet known as the World Wide Web, or, more simply, the Web, is a subset of the computers on the Internet that are connected to each other in a specific way that makes those computers and their contents easily accessible to each other. The most important thing about the Web is that it includes an easy-to-use standard interface. This interface makes it possible for people who are not computer experts to use the World Wide Web to access a variety of Internet resources.

In the early 1960s, the US Department of Defense became very much concerned about the possible effects of a nuclear attack on its computing facilities. The Defense Department realized the need for powerful computers for coordination and control. The powerful computers

of that time were all large mainframe computers. So the Defense Department began examining ways to connect these computers to each other and also to weapon installations that were distributed all over the world. The Defense Department agency, charged with this task, hired many of the best communications technology researchers and funded research at leading universities and institutes to explore the task of creating a worldwide network that could remain operational even if parts of the network were destroyed by enemy military action or sabotage. These researchers worked to devise ways to build networks that could operate independently—that is, networks that would not require a central computer to control network operations.

The world's telephone companies were the early models for networked computers, because early networks of computers used leased telephone company lines for their connections. Telephone company systems of that time established a single connection between sender and receiver for each telephone call, and that connection carried all the data along a single path. When a company wanted to connect computers it owned at two different locations, it placed a telephone call to establish the connection and then connected one computer to each end of that single connection.

The Defense Department was concerned about the inherent risk of this single-channel method for connecting computers. So its researchers developed a different method of sending information through multiple channels. In this method, files and messages are broken into packets and labelled electronically with codes about their origin and destination. The 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. Each computer that an individual packet encounters on its trip through the network, determines the best way to move the packet forward to its destination.

In 1969, these Defense Department researchers used this network model to connect four computers—one each at the University of California at Los Angeles, SRI International, the University of California at Santa Barbara, and the University of Utah. During the subsequent years, many researchers in the academic community connected to this network and contributed to technological developments that increased the speed and efficiency with which the network operated. At the same time, researchers at other universities were creating their own networks using similar technologies.

The upshot was the Internet Protocol (IP), which enabled any number of computer networks to link up and act as one—and eventually it was given the name, the Internet. This meant that the communication network among the computers was not dependent on any single computer to operate, and so could not be shut down by destroying one or even several of the computers. Thus, the Defense Department got what it wanted. And a new, growing system of computer networks was spawned.

Although the goals of the Defense Department network were still to control weapons systems and transfer research files, other uses of this vast network began to appear in the early 1970s. In 1972, a researcher wrote a program that could send and receive messages over the network. Thus was born the e-mail which came to be widely used very quickly. The number of network users in the military and education research communities continued to grow. Many of these new participants used the networking technology to transfer files and access remote computers. The network software included two tools for performing these

tasks. File Transfer Protocol (FTP) enabled users to transfer files between computers, and Telnet let users log on to their computer accounts from remote sites. Both FTP and Telnet are still widely used on the Internet for file transfers and remote logins, even though more advanced techniques are now available that allow multimedia transmissions such as real-time audio and video clips.

The first e-mail mailing lists also appeared on these networks. In 1979, a group of students and programmers at the Duke University and the University of North Carolina started Usenet, an abbreviation for Users News Network. Usenet allows anyone who connects to the network to read and post articles on a variety of subjects. The Defense Department's networking software became more widely used as academic and research institutes realized the benefits of having a common communications network. The explosion of personal computer use during that time also helped more people become comfortable with computing. In the late 1980s, these independent academic and research networks merged into one infrastructure—the *Internet* that links today hundreds and thousands of networks to one another.

Commercial Use of the Internet

As personal computers became more powerful, affordable, and available during the 1980s, companies increasingly used them to construct their own internal networks. Although these networks included e-mail software that enabled the employees to send messages, businesses wanted their employees to be able to communicate with people outside their corporate networks for promoting business. The Defense Department network and most of the other academic networks that had teamed up with it were receiving funding from the National Science Foundation (NSF). The NSF prohibited commercial network traffic on its networks and so businesses turned to commercial e-mail service providers to handle their e-mail needs. Larger firms built their own networks that used leased telephone lines to connect field offices to corporate headquarters.

In 1989, the NSF permitted two commercial e-mail services, MCI Mail and CompuServe to establish limited connections to the Internet for the sole purpose of exchanging e-mail transmissions with users of the Internet. These connections allowed commercial enterprises to send e-mail directly to Internet addresses and allowed members of the research and education communities on the Internet to send e-mail directly to MCI Mail and CompuServe addresses. The NSF justified this limited commercial use of the Internet as a service that would primarily benefit the Internet's non-commercial users.

Growth of the Internet

In 1991, the NSF further eased its restrictions on Internet commercial activity and began implementing plans to privatize the Internet. The privatization of the Internet was substantially completed in 1995, when the NSF turned over the operation of the main Internet connections

to a group of privately owned companies. The new structure of the Internet was based on four Network Access Points (NAPs), each operated by a separate company. These companies, which are known as *network-access providers*, sell Internet access rights directly to larger customers and indirectly to smaller firms through other companies, called *Internet Service Providers* (ISPs).

The Internet was a phenomenon that truly sneaked into an unsuspecting world. The researchers who had been so involved in the creation and growth of the Internet just accepted it as a part of their working environment. People outside the research community were largely unaware of the potential offered by a large interconnected set of computer networks.

Within 30 years, the Internet became one of the most amazing technological and social accomplishments of the 20th century. Millions of people are using today this complex, interconnected network of computers. These computers run thousands of different software packages. The computers are located in almost every country of the world. Every year, billions of dollars change hands over the Internet in exchange for all kinds of products and services. All of this activity occurs with no central coordination point or control, which is especially interesting, given that the Internet began as a way for the military to maintain control while under attack.

The opening of the Internet to business activities helped increase the Internet's growth dramatically; however, there was another development that worked hand in hand with the commercialization of the Internet to spur its growth. That development was the World Wide Web (WWW).

Emergence of the World Wide Web

The web is more a way of thinking about and organizing information storage and retrieval than a technology. As such, its history goes back to many years. Two important innovations played key roles in making the Internet easier to use and more accessible to people who were not research scientists. These two innovations were *Hypertext* and *Graphical User Interfaces* (GUIs).

Origins of the Web

In 1945, Vannevar Bush, who was director of the US Office of Scientific Research and Development, wrote an Atlantic Monthly article about ways that scientists could apply the skills they learned during World War II to peacetime activities. The article included a number of visionary ideas about future uses of technology to organize and facilitate efficient access to information. Bush speculated that engineers would eventually build a machine that he called the *Memex* (a memory extension device), that would store all—a person's books, records, letters, and research results—on microfilm. Vannevar Bush described a system for associatively linking information in his July 1945 article in *The Atlantic Monthly*, 'As We May Think'.[2]

Hypertext, as implemented on the Web, however, has its origins in the start of the electronic computer age, when ideas about associative linking could be married with the

[2] http://www.isg.sfu.ca/~duchier/misc/vbush

possibilities of automated storage-and-retrieval systems. Douglas Engelbart, who also invented the computer mouse, created the first experimental hypertext system on one of the largest computers of the 1960s. In 1965, Ted Nelson coined the term *hypertext* to describe a text that is not constrained to be sequential. Hypertext, as described by Nelson, links documents to form a web of relationships that draws on the possibilities for extending and augmenting the meaning of a 'flat' piece of text with links to other texts. Hypertext therefore is more than just footnotes that serve as commentary or further information in a text. Instead, it extends the structure of ideas by making 'chunks' of ideas available for inclusion in many parts of multiple texts. Nelson also coined the term *hypermedia*, which is a hypertext not constrained to be text. It can include the combination of text, pictures, graphics, sound, and movies.

The ideas of Vannevar Bush, Ted Nelson and others, about information systems, showed up in another project in the late 1980s. In March 1989, Tim Berners-Lee, a researcher at the *Conseil Europeen pour la Recherche Nucleaire* (CERN), the European Laboratory for Particle Physics in Geneva, Switzerland, proposed a hypertext system to enable efficient information sharing for members of the high-energy physics community. This proposal, called *HyperText* and *CERN*, was circulated for comments. The important components of the proposal follow:

- A user interface that would be consistent with all platforms and that would allow users to access information from many different computers.
- A scheme for this interface to access a variety of document types and information protocols.
- A provision for universal access, which would allow any user on the network to access any information.

In October of 1991, a gateway from the Web to Wide Area Information Server (WAIS) software was completed. On 15 January 1991, the WWW interface became publicly available from CERN, and the CERN team demonstrated the Web to researchers internationally throughout the rest of the year.

By 1993, there were about 50 Web servers in existence, and the first graphical interfaces (called *clients* or *browsers*) for the X Window System and the Macintosh became available in Switzerland. Until 1993, most of the development of Web technologies came out of CERN. In early 1993, however, a young undergraduate, Marc Andreessen, at the University of Illinois at Urbana-Champaign shifted the stage to the United States. Working on a project for the National Center for Supercomputing Applications (NCSA), Andreessen led a team that developed an X Window System browser for the Web and called it *Mosaic*. Marc Andreessen and his colleagues then left NCSA in March 1994 to form a company that later came to be known as Netscape Communications Corporation. By May 1994, the interest in the Web was so intense that the first international conference on the WWW, held in Geneva, overflowed with attendees. By mid 1994, it was clear to the original developers at CERN that the stable development of the Web should fall under the guidance of an international organization. In July, the Massachusetts Institute of Technology (MIT) and CERN announced the World Wide Web Organization (which was later known as the World Wide Web Consortium, or W3C). Today, the W3C guides the technical development and standards for the evolution of the Web.

In 1995, the Web development was marked by rapid commercialization and technical change. Netscape Communication's browser, called *Netscape Navigator* (nicknamed *Mozilla*) continued to include more extensions of the Hypertext Markup Language (HTML), and at the same time the issues of security for commercial cash transactions garnered much attention. By May 1995, there were more than 15,000 known public Web servers—a ten-fold increase over the number that existed only a year before.

Hypertext Transfer Protocol (HTTP) is the Internet protocol responsible for transferring and displaying Web pages. HTTP runs in the application layer of the Transmission Control Protocol/Internet Protocol (TCP/IP) model. Like the other Internet protocols, HTTP employs the client-server model in which a user's Web browser opens an HTTP session and sends a request to the remote server for a Web page. In response, the server creates an HTTP response message that is sent back to the user's Web browser. The response contains the page displayed by the client's browser. After the client determines that the message it received is correct, the TCP/IP connection is closed and the HTTP session ends. The process is demonstrated in Figure 1.1.

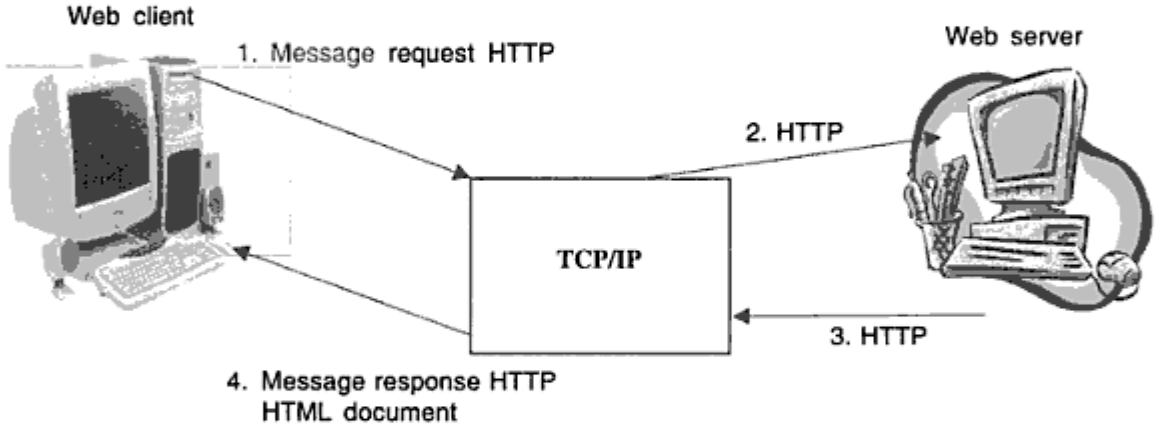

Fig. 1.1 Client-server architecture using HTTP.

The Milestones[3]

1988	—	The number of hosts on the net became over 60,000.
1989	—	Over 10,000 hosts on the net were registered.
1991	—	The World Wide Web (WWW) was created by CERN in Switzerland.
1992	—	One million hosts on the net were found.
1993	—	The InterNic is created to handle domain name registration.
1995	—	There were a total of 6.6 million hosts or computers on the Internet.
July 1996	—	An estimated 12.8 million hosts, 212,155 web sites and about 25 million users of the web. About 90% of the users of the web are in the United States.

[3] http://www.w3.org/History

July 1997 — 1.3 million domain names registered.
December 1997 — 22 million servers, 40 million users on the WWW.
2000 — 110 million users and 72 million Domains Names.
2003 — 802.2 million users 233 million hosts.
2004 — 817 million users.
2005 — 1018 million users.
2006 — 1093 million users.
2007 — 1350 million users.

The number of world wide web users continues to double in size about every 12 to 15 months. All of these have had an impact. Perhaps the most significant factor, though, is that the Internet offers a range of messaging techniques, all of which work rapidly. The standards used to make it work are not all ratified by international standards bodies, but they do work. The factor of not having to wait for standards to be agreed has surely accelerated the growth in the number of Internet users.

An equally significant factor is that, with the existing level of awareness of e-commerce practices, companies can easily identify the Internet as a means of exchanging business data. The Internet has some drawbacks with regard to security and data integrity.

The growth of web sites over the years[4] is shown in Table 1.1. The corresponding graph is found in Figure 1.2.

TABLE 1.1
GROWTH OF THE NUMBER OF HOSTS OVER THE YEARS

Year	*Number of hosts advertised in the DNS*
1993	1,313,000
1994	2,217,000
1995	4,852,000
1996	9,472,000
1997	16,146,000
1998	29,670,000
1999	43,230,000
2000	72,398,092
2001	109,574,429
2002	147,344,723
2003	171,638,297
2004	317,646,084
2005	353,284,187
2006	394,991,609
2007	433,193,199
2008	500,000,000

[4] http://www.isc.org

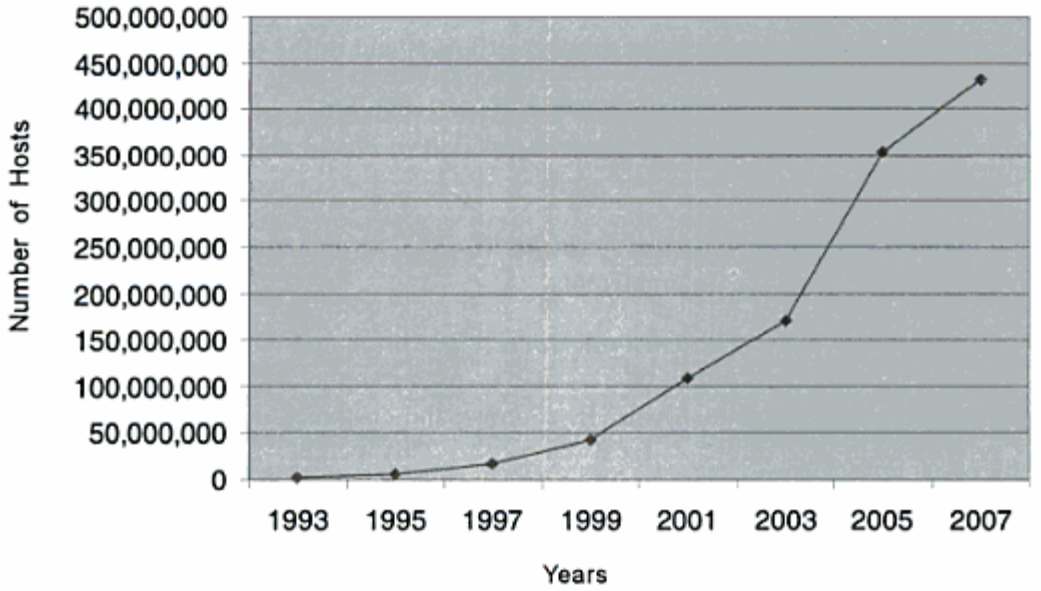

Fig. 1.2 Growth in the number of Internet hosts over the years.

Advantages of E-commerce

Some of the key strengths of using the Internet for businesses include the following:

1. ***24 × 7 operation.*** Round-the-clock operation is an expensive proposition in the 'brick-and-mortar' world, while it is natural in the 'click-and-conquer' world.

2. ***Global reach.*** The net being inherently global, reaching global customers is relatively easy on the net compared to the world of bricks.

3. ***Cost of acquiring, serving and retaining customers.*** It is relatively cheaper to acquire new customers over the net; thanks to 24 × 7 operation and its global reach. Through innovative tools of 'push' technology, it is also possible to retain customers' loyalty with minimal investments.

4. ***An extended enterprise is easy to build.*** In today's world every enterprise is part of the 'connected economy'; as such, you need to extend your enterprise all the way to your suppliers and business partners like distributors, retailers and ultimately your end-customers. The Internet provides an effective (often less expensive) way to extend your enterprise beyond the narrow confines of your own organization. Tools like enterprise resource planning (ERP), supply chain management (SCM) and customer relationship management (CRM), can easily be deployed over the Internet, permitting amazing efficiency in time needed to market, customer loyalty, on-time delivery and eventually profitability.

5. ***Disintermediation.*** Using the Internet, one can directly approach the customers and suppliers, cutting down on the number of levels and in the process, cutting down the costs.

6. ***Improved customer service to your clients.*** It results in higher satisfaction and more sales.

7. ***Power to provide the 'best of both the worlds'.*** It benefits the traditional business side-by-side with the Internet tools.

8. ***A technology-based customer interface.*** In a brick-and-mortar business, customers conduct transactions either face-to-face or over the phone with store clerks, account managers, or other individuals. In contrast, the customer interface in the electronic environment is a 'screen-to-face' interaction. This includes PC-based monitors, ATM machines, PDAs, or other electronic devices such as the DoCopMo iMode in Japan and the Nokia 7100 in Europe. Operationally, these types of interfaces place an enormous responsibility on the organization to capture and represent the customer experience because there is often no opportunity for direct human intervention during the encounter. If the interface is designed correctly, the customer will have no need for a simultaneous or follow-up phone conversation. Thus, the 'screen-to-customer' interface has the potential to both increase sales and decrease costs. In fact, a number of innovators are entering the e-commerce markets with solutions that reintroduce humans into the process, such as the service representatives available on demand for Web users at www.liveperson.com. When the interface does not work, not only is the revenue lost but the organization also incurs the technology costs. Thus, a poorly designed customer interface has both negative revenue and cost implications.

9. ***The customer controls the interaction.*** At most websites, the customer is in control during screen-to-face interaction, in that the Web largely employs a 'self service' model for managing commerce or community-based interaction. The customer controls the search process, the time spent on various sites, the degree of price/product comparison, the people with whom he or she comes in contact, and the decision to buy. In a face-to-face interchange, the control can rest with either the buyer/seller or the community member. At a minimum, the seller attempts to influence the buying process by directing the potential buyer to different products or locations in the store, overcoming price objections and reacting in real item to competitive offering. The virtual store can attempt to shape the customer experience with uniquely targeted promotions, reconfiguration of storefronts to reflect past search behaviour, recommendations based on previous behaviour of other similar users, and access to proprietary information. However, the seller has much less power in the online environment due to the control and information flows that the online world puts in customer's hands.

10. ***Knowledge of customer behaviour.*** While the customer controls the interaction, the firm has unprecedented access to observe and track individual consumer behaviour. Companies, through a third-party measurement firm such as Vividence and Accrue,

can track a host of behaviours on websites visited, length of stays on a site, page views on a site, contents of wish lists and shopping carts, purchases, dollar amounts of purchases, repeat purchases behaviour, conversion rates of visitors who have completed transactions and other metrics. This level of customer behaviour tracking, in contrast with tracking consumer attitudes, knowledge or behavioural intentions, is not possible in the brick-and-mortar world. Armed with this information, companies can provide one-to-one customization of their offerings. In addition, companies can dynamically publish their storefronts on the Web to configure offerings to individual customers. In a tactical embellishment, electronic retailers can welcome a user back by name. In more strategic terms, an online business can actually position offers and merchandise in ways that uniquely appeal to specific customers.

11. ***Network economics.*** In information intensive industries, a key competitive battleground centres on the emergence of industry-standard products, services, components, and or architecture. Network effects, as described by Metcalfe's law, can best be expressed as the situation where the value of a product or service rises as a function of the number of other users who are using the product. A classic example is the fax machine of other people who adopt the technology. A key characteristic of network's economic is positive feedback, that is, as the installed base grows, more and more users are likely to adopt the technology because of the installed base. Many commercial wares in the digital economy revolve around setting a standard, growing the installed base and attempting to 'lock-in' customers to the standard because of rising switching costs. This applies to both hardware (e.g. cable modems versus DSL lines) and software (e.g. MP3 versus streaming audio). A key result of network effects and positive feedback is 'increasing return' economies as compared to the traditional decreasing-returns model often associated with the brick-and-mortar world. It also means that the traditional realities of marketing such as the importance of word-of-mouth (WOM) among potential customers, become greatly magnified in this new environment. It is this turbocharged WOM phenomenon that makes viral marketing a reality for consumer-oriented e-commerce business such as ICQ in instant messaging system.

Disadvantages of E-commerce

Some business processes may never lend themselves to electronic commerce. For example, perishable foods, and high-cost items (such as jewellery, antiques, and the like), may be difficult to inspect from a remote location, regardless of any technologies that might be devised in the future. Most of the disadvantages of electronic commerce today, however, stem from the newness and rapidly developing pace of the underlying technologies. These disadvantages will disappear as e-commerce matures and becomes more and more available to and gets accepted by the general population. Many products and services require a critical mass of potential buyers who are well-equipped and willing to buy through the Internet.

Businesses often calculate the return-on-investment before committing to any new technology. This has been difficult to do with e-commerce, since the costs and benefits

have been hard to quantify. Costs, which are a function of technology, can change dramatically even during short-lived e-commerce implementation projects, because the underlying technologies are changing rapidly. Many firms have had trouble in recruiting and retaining employees with technological, design, and business process skills needed to create an effective e-commerce atmosphere. Another problem facing firms that want to do business on the Internet is the difficulty of integrating existing databases and transaction-processing software designed for traditional commerce into a software that enables e-commerce.

In addition to technology and software issues, many businesses face cultural and legal obstacles in conducting e-commerce. Some consumers are still somewhat fearful of sending their credit card numbers over the Internet. Other consumers are simply resistant to change and are uncomfortable viewing merchandise on a computer screen rather than in person. The legal environment in which e-commerce is conducted is full of unclear and conflicting laws. In many cases, government regulators have not kept up with the trends in technologies.

Online Extension of a BAM Model

Since most conventional brick-and-mortar (BAM) organizations have established processes, people, structures and supply chains, they can become strong competitors to the *dot-coms* (that have no offline presence) by e-enabling their supply chains. Most BAM organizations will gain competitive advantage by creating more value for the customers at the same cost or delivering the same goods at a lower cost by using the Internet. For example, an automobile manufacturer can pass on the cost savings achieved by e-procurement, a bank can reduce the need for physical branches by making use of e-banking. So leveraging the supply chain by making use of information, relationships, and commerce and squeezing out more value out of it, would enable BAM organizations to have a level of efficiency, unparalleled by pure dotcoms. Besides, dot coms without any offline presence would have to set up their supply chains from scratch. In this respect, they are greatly disadvantaged in comparison to their offline counterparts.

Transition to E-commerce in India

The potential for e-commerce is enormous in India, owing to the rapid growth of the number of Internet users. The enormous savings in time and money achieved by both buyers and sellers is the principal advantage.

Indian Readiness for E-commerce

A pertinent question arises here about the readiness of Indian buyers for e-commerce. The proliferation of the Net at a rapid pace and the granting of private ISP (Internet Service

Provider) licences has put the market *en route* to a new phase. Even small and medium enterprises (SMEs) have been increasingly realizing the potential of the net.

The technological advancements happening in all spheres of life in India will be the driving factors for the spread of e-commerce in this country, as has happened elsewhere in the world. NASSCOM (National Association of Software and Service Companies), has recently released the findings of its survey to evaluate the e-commerce scenario in India. E-commerce is dependent to a great extent, on the number of internet users in India. The following tables give the rate of growth of internet users in India.[5]

TABLE 1.2
GROWTH OF INTERNET IN INDIA

(in thousands)

Year	*Internet subscribers*	*Internet users*
1997	25	45
1998	150	200
1999	359	1000
2000	650	2000
2001	1130	6668
2002	1763	10684
2003	3661	29000
2004	4403	31723
2005	6000	35000
2006	25000	37000

The Internet and India

The Internet has undergone a steady evolution from being a source of instant communication in the early 90s to a rich source of infotainment and education. This evolution has been driven by the growing customer expectations with the content of Internet. Thus newer segments of Internet usage have emerged and there lie potential user segments that are still unexplored and may emerge in the future.[6]

Five years ago there was limited Internet access but only in a few major cities, all in the hands of the government. VSNL, the agency responsible for Internet activities, and the DOT (Department of Telecommunications) provided an agonizingly erratic connectivity, with miserly bandwidth and far too few phone lines. Connection rates ran as low as 5% and users were frequently cut off. And the rates for this pathetic level of service were among the highest in the world. By the end of 1998, after three years of government monopoly, there were barely 150,000 Internet connections in India.[7]

[5] www.nasscom.org
[6] www.ciol.com
[7] www.indax.com

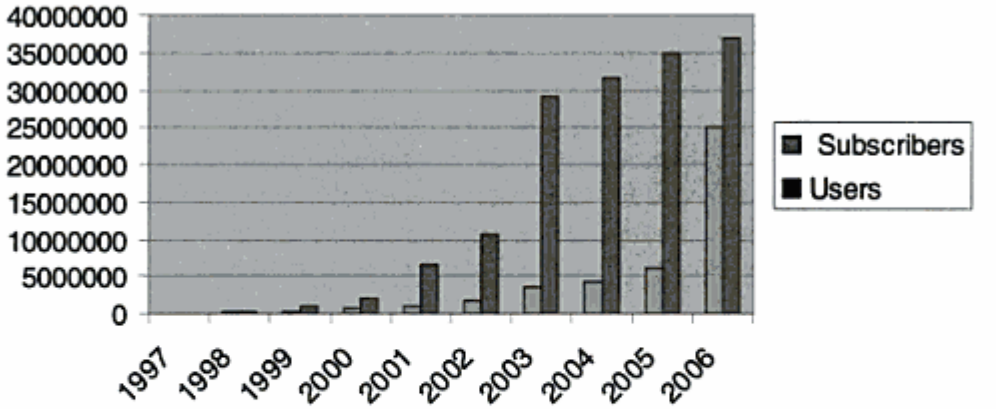

Fig. 1.3 Internet usage in India.

Presently, the government monopoly is largely over. Dozens of small to large Internet Service Providers have set up shop, triggering a price war and an improvement of service. Users are now estimated at over 37 million, with a growth predicted to reach more than 50 million in the next three years.

According to the Nasscom survey, the total volume of e-commerce transactions in India was about Rs 450 crores in 1999–2000. Out of this volume, about Rs 50 crores were contributed by retail internet or Business-to-Consumer transactions (B2C), and about Rs 400 crores by Business-to-Business transactions (B2B). To some, Rs 450 crores of e-commerce transactions may seem to be negligible. However, given the situation in India, this amount seems impressive in the background of an almost non-existing regulatory framework to support e-commerce. Thus, if e-commerce-based businesses can emerge as viable propositions working within the confines of the existing not-so-conducive framework, imagine the potential that would be unleashed once we have a suitable, catalysing framework in place! With the passing of the I.T. Bill in both Houses of Parliament, a legal regulatory structure exists and what is now required is effective enforcement.

TABLE 1.3
TOTAL E-COMMERCE TRANSACTIONS IN INDIA[8]

(*Rs in crores*)

Year	*Total e-commerce transactions*
1998–1999	131
1999–2000	450
2000–2002	1400
2006	2300
2007	7000

[8] www.nasscom.org

According to the NASSCOM survey, considering the interest the Government is taking in the growth of the market, e-commerce in India will witness a significant jump over the next three years. Based on these preliminary findings, experts have concluded that the penetration of the Internet and e-commerce transactions in India will increase by leaps and bounds. The survey findings also point to the fact that India's active Internet population would spend close to 3.2 per cent of its total regular household spending through Internet purchase.

Revenue streams will increasingly be aligned with the emerging global model, it is being anticipated. This would mean that the major part of the revenues would come from transactions, while a smaller amount would be realized from advertising. It is expected that by 2003, more than 75 per cent of the revenues of Internet business-to-consumer businesses would come from transactions. The advertisement revenues would amount to about 8 per cent of the total ad spent by the companies. Analysts also believe that one of every four Non Resident Indians would make some form of purchase from India-based sites.

E-commerce Opportunities[9] for Industries

Following are some of the areas where e-commerce is witnessing rapid growth in the global markets. Indian software and services companies need to tap into some of these vertical segments to gain the maximum advantage in the e-commerce solution sector.

1. ***Financial services.*** A large number of users use the Internet for some form of financial guidance.

2. ***Stock trading.*** Online stock trading is nowadays one of the most demanding e-commerce utilities. The ability to offer market access at a competitive price is a key advantage of online stock broking companies and this is slowly happening in India too.

3. ***Banking.*** Internet banking is now growing. Many banks like ICICI and HDFC are making inroads into this area.

4. ***Legal and professional services.*** Opportunities also exist for Indian companies in legal and other professional services. There are significant legal and regulatory implications of implementing an Internet business or of migrating from a traditional off-line business. In terms of opportunities for Indian legal service providers, the requirement for professional, legal and regulatory advice is expected to increase as the number of e-commerce users increases.

5. ***Tour and travel.*** The travel industry has readily adapted to e-commerce. There has been a growing emphasis on the search for alternative distribution channels within the sector, particularly with the railways and the airlines, as they seek to reduce costs. These sectors have adapted well because of their online reservation systems.

[9] *NASSCOM Strategic Review*, 2001, p. 144.

6. ***Healthcare.*** Healthcare represents one of the biggest expenditures of governments worldwide. The Internet has the potential to enhance communications, streamline processes and create new business opportunities, by providing high-quality administrative services and integrating information systems.

TELCO—Managing Supply Chain on the Internet

India's largest commercial vehicle manufacturer, Tata Engineering and Locomotive Company (TELCO) started connecting, in 1999, its existing 130-strong dealer network online with the company's Internet-based system. It also has plans to bring all its dealers for commercial vehicles and passenger cars on the company's network. Group Company Tata Technologies Limited is developing interfaces with its back-end ERP systems. The Internet-based system currently covers the company's major manufacturing locations in Pune, Jamshedpur and Lucknow and its headquarters in Mumbai. It is also negotiating with a few banks to establish payment gateways between the value chain at the company-end and the banks. The effort, which has taken Rs 3 crores worth of investment in infrastructure and eight man-years of system development and implementation, is expected to help Tata Engineering cut down conventional delays in transactions. TELCO is also expecting to cut down the existing transaction time at the dealer-end by 50 per cent. The initiative will also result in more accurate and secured information and eliminate chaos and confusion. The dealers will be able to book according to their requirements and receive supplies much faster. The initiative will help both the company and the dealers to keep inventories under control. The company will also be in a better position to customize products according to specific dealer requirements at a short notice.

Hindustan Lever—Getting the E-advantage

As a part of the Internet initiative, Hindustan Lever has put in place a network, connecting all its suppliers and has launched a pilot project to wire up its 7500 distributors. In the second phase, it will attempt the mammoth task of connecting its top retailers. Finally, it also wants to use the Internet for transactions. Lever sees the e-tailing opportunity not only for its own product categories but also for a larger universe of products. With its formidable distribution system, which covers nearly two million retail outlets, Lever already has in place the back-end infrastructure that other e-tailers could kill for and is uniquely positioned to create India's most widespread, robust and efficient clicks-and-bricks company. Lever's e-gameplan is to build a number of market-leading B2B and B2C businesses in high-potential areas. And in doing this, it will leverage its strong consumer and supplier relationships and its cache of human talent.

Asian Paints—E-transforming the Organization

Asian Paints, India's largest paint company, is reaping the benefits of its investments in Internet-enabling its organization. Information Technology has been made use of efficient data collection, demand forecasting, reduction in working capital and online information about material flows across factories and other locations. Given the complexity of the demand chain and the logistics and the seasonal nature of the demand, the use of the Internet in connecting the 15,000 dealers and the 55 branch offices has improved the efficiency of the supply chain. It has also increased the service levels and has cut down the working capital in the chain. The company is also planning to do bulk transactions for its products through its website by making it a one-stop virtual storefront. The use of a comprehensive database of customers for e-relationship management is also being mulled.

CRISIL—Cost-effective Distribution Channels

CRISIL, the largest credit-rating agency in India, has already made its presence felt in the new economy sector for online dissemination of its research products. CRISIL has built up a large database on Indian corporates and research products over the years and is currently using the Web to enhance its reach as well as establish a cost-effective distribution channel for its products. It plans to use its website for quick delivery of quality research products for its customers as well as develop interactive tools based on what-if scenarios.

ICICI Bank—Comprehensive Transactions

ICICI Bank is using the Internet to acquire more customers by offering them a host of services. Its idea is to become a one-stop site where the account holders can do all their money transactions. On other sites one can trade online but all other transactions still have to be done physically. ICICI offers the entire chain, from the Demat account in which a customer's shares are credited to the savings account from which the money is debited to settle the transaction for access.

The bank has also launched an electronic bill payment service through its Internet banking service. The new payment system will do away with any paperwork since the biller will be presenting his bills to customers through the bank's website, while the customer will pay through the Internet. For this, the customers will have to register for an Internet banking account with the bank. Thus the bank will be able to target both the B2B and B2C markets.

E-transition Challenges for Indian Corporates

Some issues that Indian corporates face while e-transforming themselves are worth delving into, in the following manner:

Internal Resisting Issues

Bureaucratic wrangles. With organizations e-transforming themselves, the old ways of doing things are being replaced by new ways which destabilize the existing power equations. The fear of this among the staff is a significant barrier to the organizational transformation.

Cultural changes. The e-biz team spearheading the e-com initiatives in an organization, mostly consists of young, externally recruited, tech savvy populace who maintain a 'skunkwork' like culture. This open culture may be in direct conflict with the already established culture in the organization and may force the old-timers to oppose any change.

Not many are prepared. A survey by the GIIC found out that only 20 per cent of the organizations covered under the CIO segment are trying to use e-commerce at least to some extent. Eighty per cent of the industry is in the process of gearing up for the show, such as banks and sectors like IT, courier, travel and transport.

Lack of skill and training. Lack of skill and training within a company (28 per cent) and lack of funds (24 per cent) are other factors impeding the implementation of IT in companies. Most of these companies are from traditional businesses like manufacturing, travel, transport and education.

External Driving Factors

Sheer necessity. No one will dispute the argument that any business will benefit if it cuts down the processing time for a transaction. E-commerce does exactly this—it increases process efficiency by reducing transaction time and this can have a significant impact on cash flows and the bottom line.

Big business, the driving factor. Business entities will themselves be the key drivers. The big bosses of the industries will be the guiding and forcing factor for SMEs to adopt the Internet. A good example is that of Cisco which has mandated that it will deal with its suppliers, dealers and partners only if they are Web-enabled. The partners, whether they like it or not, have been forced to make the change. If the same happens in India and companies like HLL, Maruti, TELCO, Reliance Industries and other major players in their respective segments make it mandatory to have their dealers, suppliers and others linked to their supply chain on the Internet, one can imagine the stampede that will ensue. Sooner or later, these companies must have their supply chain e-driven, if they are to compete in the global market, and this again will lead to growth in the B2B segment.

Global market. If you are looking at 'the world as your market', e-commerce will fit in neatly with your plans. Globalization is forcing organizations to achieve new competitive levels in order to enter the world market. So if we are late to react, we shall lose the early-entrant advantage and a whole lot of market share. It is imperative that we get on to the e-commerce bandwagon for the sheer efficiencies that it can generate.

Value for money. Purely from the customer's perspective, e-commerce will be one of the key factors in propelling B2C growth in the Indian market. The driving factors for the B2C segment will be convenience, low cost to end-consumers and a wider choice. If you take a look at the products available on *rediff.com*, this point will be clear. Most products are available at discounts of 20–50 per cent over the price in the physical world. Besides, the opportunity of comparing prices on two different sites is just a click away and you will then avail the best option available.

No-entry barriers. The good thing about the Internet is that one does not need deep pockets to be successful. The Internet is an upstart's paradise. Even if you have a flourishing business in the physical world, it will not take much resource or time for a new entrant to compete with you. Remember how the innovative *amazon.com* grew from nothing to become the largest bookseller 'in the universe'. All this while, Barnes & Noble, the dominant player with huge financial resources, watched its market share being eroded by the upstart, forcing it finally to get on the e-commerce bandwagon. If this can happen with Barnes & Noble, it can happen with your business too. Alternatively, if *amazon.com* can give Barnes & Noble a run for its money, so can you to your established competitor.

Other factors. With the private ISPs becoming aggressive and also looking at the huge cable market to provide Internet connections, it is only a matter of time before subscriber numbers start looking up.

Now, we shall discuss some of the factors that could hinder the success of e-commerce.

Doubts and Difficulties

Households are shaky about buying over the Internet. A very high proportion among PC owners and PC non-owners opine that they would not like to buy through the Internet. The reasons are they are not sure of the quality and the delivery of the products. They need to feel the products and bargain before they buy them. Many do not understand the new method of buying and selling in a digital environment. This reluctance among households prevents e-commerce from achieving the critical mass, and forces the corporates to adopt a 'wait and watch' policy.

Computers are not bought for browsing the Internet. Browsing the Internet and purchasing through the Internet are among the least important perceived benefits of owning a computer. Business, learning (self) and education for children are so far given as the main reasons for purchasing a computer.

Lack of proper commercial and legal system. Security, lack of proper and secure payment structures, legal issues: a clear fix on contracts and liabilities in the digital economy, and trust and assurance are the main concerns.

The Information Technology Act, 2000

The Parliament of India passed its first **Cyberlaw** on the 17th of October 2000, the **Information Technology (IT) Act, 2000** which provides the legal infrastructure for e-commerce in India. The purpose of the IT Act, 2000, as mentioned in the language of the Act is:

> *to provide legal recognition for transactions carried out by means of electronic data interchange and other means of electronic communication, commonly referred to as "electronic commerce", which involve the use of alternatives to paper-based methods of communication and storage of information, to facilitate electronic filing of documents with the Government agencies and further to amend the Indian Penal Code, the Indian Evidence Act, 1872, the Banker's Book Evidence Act, 1891 and the Reserve Bank of India Act, 1934, and for matters connected therewith or incidental thereto.*

The General Assembly of the United Nations, by its resolution A/RES/51/162 dated 30th January 1997, adopted the Model Law on Electronic Commerce adopted by the United Nations Commission on International Trade Law. The same resolution recommends *inter alia* that all States give favourable consideration to this Model Law when they enact or revise their laws, keeping in mind the need for uniformity of law pertaining to alternatives to paper-based methods of communication and storage of information. The Indian Information Technology Act, 2000, accordingly draws upon the Model Law.

The implementation of this Act has kick started a new era of e-governance and will have a lot of impact on the way people do business in India and will also open up new opportunities for e-business, as people would be less apprehensive about the legal hassles and issues not under the jurisdiction of law, e.g. authenticity of digital documents, hacking, digital signatures, and so on.

Therefore, it is essential for us to understand what the IT Act, 2000 offers and what its various perspectives are.

Highlights of the IT Act, 2000

For a basic understanding of the IT Act by the layman, the salient features of the Act and its relevant portions on e-business are enumerated below:

- Electronic contracts are legally valid—EDI accorded legal recognition.
- Legal recognition accorded to digital signatures.
- Digital signature to be effected by use of asymmetric crypto system and hash function.
- Security procedure for electronic records and digital signature.

- Appointment of Certifying Authorities (CAs) and the Controller of Certifying Authorities (CCA) including recognition of foreign Certifying Authorities.
- Controller to be appointed, who will act as repository of all digital signature certificates.
- Certifying Authorities require to get licence to issue digital signature certificates.
- Various types of computer crimes defined and stringent penalties provided under the Act.
- Appointment of Adjudicating Officer for holding inquiries under the Act.
- Establishment of Cyber Appellate Tribunal under the Act.
- Appeal from order of Adjudicating Officer to Cyber Appellate Tribunal and not to any Civil Court.
- Appeal from order of Cyber Appellate Tribunal to High Court.
- Act to apply for offences or contraventions committed outside India.
- Network Service providers not to be liable in certain cases.
- Power to Police officers and other officers to enter into any public place and search and arrest without warrant.
- Constitution of Cyber Regulations Advisory Committee to advise the Central Government and Controller.
- Amendments effected in:
  (a) Indian Penal Code
  (b) Indian Evidence Act
  (c) Banker's Books Evidence Act
  (d) Reserve Bank of India Act

Important Concepts Introduced in the IT Act, 2000

Some of the important concepts introduced in the IT Act, 2000 are:

- Electronic record
- Secure electronic record
- Digital signature
- Secure digital signature
- Certifying authority
- Digital signature certificate

The concept of electronic record, as envisaged by the Act has already been described. A secure electronic record has been defined in the Act as follows:

> *Where any security procedure has been applied to an electronic record at a specific point of time, then such record shall be deemed to be a secure electronic record from such point of time to the time of verification.*

The security procedures envisaged are not prescribed by the Act. The Act specifies that the central government shall prescribe the security procedures. Thus insofar as the Act is concerned, the secure electronic record is a purely legal concept and not a technological one. The application of the prescribed procedure will create a presumption, in the eyes of the law,

relating to the authenticity and integrity of the record. Therefore, not only must the security of the procedure be such that it indeed offers adequate security, but it must also be demonstrated that the correct procedure has in fact been applied.

The IT Act, 2000 prescribes that electronic records are to be authenticated by means of affixing a digital signature. This digital signature must be effected by the use of an asymmetric crypto system and hash function. In contrast, the European Electronic Signature Standardisation Initiative (EESSI) is technology neutral in its prescription of how an electronic signature may be effected.

This point needs a little elaboration. Until fairly recently (about 1997) it was believed that the use of asymmetric crypto systems would be the foundation for all electronic authentication. However, there is an increasing awareness that other technologies, such as *biometrics*, also offer the promise of electronic authentication. Consequently, there is greater interest in technology-neutral legislation. This type of technology-neutral specification tends to be called *electronic signature* as opposed to *digital signature*, which is just one type of electronic signature.

The concept of a secure digital signature, as the Act puts it, is:

> *If, by application of a security procedure agreed to by the parties concerned, it can be verified that a digital signature, at the time it was affixed, was*
>
> *(a) unique to the subscriber affixing it;*
>
> *(b) capable of identifying such a subscriber;*
>
> *(c) created in a manner or using a means under the exclusive control of the subscriber and is linked to the electronic record to which it relates in such a manner that if the electronic record was altered the digital signature would be invalidated, then such digital signature shall be deemed to be a secure digital signature.*

It can be seen that the concept of secure digital signature is a purely legal concept rather than a technical one. The parties concerned must agree on a security procedure, and once it is demonstrated that the security procedure was indeed applied, then the digital signature will be deemed secure, and all the legal presumptions that stem from this consideration, will then be applicable.

The technical requirements for effecting digital signatures by the use of an asymmetric crypto system with hash function are a private key to effect a digital signature and a public key to verify such a signature. The private key must be kept secret, as its name implies. The public key must be made available to any individual who needs to verify a signature created with the private key. The Act stipulates that the association between a subscriber's name and his public key should be made available by a duly licensed certifying authority in the form of a *digital signature certificate*.

The Act provides for a Controller of Certifying Authorities to be appointed by the central government. The functions of the Controller include licensing and regulation of operations of organizations that may act as certifying authorities.

A certifying authority provides a subscriber for a fee, with a digital signature certificate and a private key. The private key is known only to the subscriber. The certifying authority is obliged to:

1. Make use of hardware, software, and procedures that are secure from intrusion and misuse.
2. Provide a reasonable level of reliability in its services which are best suited to the performance of intended functions.
3. Adhere to security procedures to ensure that the secrecy and privacy of the digital signatures are assured.
4. Observe such other standards as may be specified by regulations.

The digital signature certificate of any subscriber is used by anyone who wishes to verify a digital signature purported to be affixed by that subscriber. Thus the basic role of a certifying authority is to establish trust in the name—public key association that is contained in the digital signature certificate.

Positive Aspects for Corporate Sector

From the perspective of the corporate sector, the IT Act, 2000 and its provisions contain the following positive aspects:

1. The implications of these provisions for the corporate sector would be that e-mail will now be a valid and legal form of communication in our country, which can be duly produced and approved in a court of law. The corporates today thrive on e-mail, not only as the form of communication with entities outside the company but also as an indispensable tool for intra-company communication. Till now it has been seen that the corporates in their intra-company communications on e-mail have not been very careful in using the language in such e-mails. Corporates will have to understand that they need be more careful while writing e-mails, whether outside the company or within, as the same with whatever language could be proved in the court of law, sometimes much to the detriment of the company. Even intra-company notes and memos, till now used only for official purposes, will also fall within the ambit of the IT Act and be admissible as evidence in a court of law. A possible consequence of the same for a typical wired company would be that any employee unhappy with a particular e-mail communication, whether received in an official or a personal form, may make the said e-mail as the foundation for launching a litigation in a court of law. Further, when a company executive sends an e-mail to another executive in the company with some defamatory or other related material and copies the same to others, there are possibilities that he may land in a litigation in a court of law.
2. Companies shall now be able to carry out electronic commerce using the legal infrastructure provided by the Act. Till now, the growth of e-commerce was impeded in our country basically because there was no legal infrastructure to regulate commercial transactions online.
3. Corporates will now be able to use digital signatures to carry out their transactions online. These digital signatures have been given legal validity and sanction in the Act.
4. The Act also throws open the doors for the entry of corporates in the business of being certifying authorities for issuing digital signature certificates. The Act does not

make any distinction between any legal entity for being appointed as a certifying authority so long as the norms stipulated by the government have been followed.

5. The Act also enables the companies to file any form, application or any other document with any office, authority, body or agency owned or controlled by the appropriate government in the electronic form as may be prescribed by the appropriate government. India is rapidly moving ahead in the field of electronic governance and it will not be long before governments start their interactions with the public by taking applications or issuing licence, permit, sanction or approvals, online. This provision can act as a great leveler as it will enable all kinds of companies to do a lot of their interaction with different government departments online, thereby saving costs, time and wastage of precious manpower.
6. Corporates are mandated by different laws of the country to keep and retain valuable and corporate information. The IT Act enables companies legally to retain the said information in the electronic form, if the
   (a) information contained therein remains accessible so as to be usable for further reference,
   (b) electronic record is retained in the format in which it was originally generated, sent or received or in a format which can be demonstrated to represent accurately the information originally generated, sent or received,
   (c) details which will facilitate the identification of the origin, destination, date and time of dispatch or receipt of such electronic record are available in the electronic record.
7. The IT Act also addresses the important issues of security which are critical to the success of electronic transactions. The Act has also given a legal definition to the concept of secure digital signatures which would be required to have been passed through a system of a security procedure, to be stipulated by the government at a later date. In the times to come, secure digital signatures shall play a big role in the *new economy* particularly from the perspective of the corporate sector as it will enable a more secure transaction online.
8. IT Act has defined various cyber crimes and has declared them penal offences punishable with imprisonment and fine. These include hacking and damage to computer source code. Often corporates face hacking into their systems and information. Till date, the corporates were in a helpless condition as there was no legal redress to such issues. But the IT Act changes the scene altogether.

However, despite the overwhelming positive features of the IT Act, 2000 for the corporate sector, some more legislations need to be enacted by the government in related areas.

Unresolved Issues in IT Act, 2000

The IT Act, 2000 does not cover the following legal issues:

- Taxation Issues that arise out of e-commerce, Internet and m-commerce, transactions.

- Intellectual Property Rights such as Digital Copyright Issues, Trade Marks, Patents.
- Domain Name Registration Policy, Domain Name Disputes, Cybersquatting.
- Privacy and Data Protection Issues.
- Rights to e-consumers, i.e. no provision for cover under COPRA.

The last-mentioned issue is of much relevance to the present discussion. The boom in the Internet business across the country made the government enact the Information and Technology Act, but experts feel that it offers little or no protection to millions of e-commerce consumers. Will these new consumers be protected under the Consumer Protection Act, 1986, is the question weighing on the minds of cyber experts. The IT Act does not have any clause ensuring security and protection to the online consumer while it is clear that consumers shall play possibly one of the most important roles in the success of e-commerce. The question that evades a definitive answer is how the online consumers and their rights will be protected where the consumers on the Internet have been touted as an integral part of this whole pyramid. What is needed is a new holistic approach which combines real world experience and online exigencies to keep the confidence of consumers for the development of e-commerce. 'Service' on Net has not been defined. It is not clear whether online trading and business amounts to providing service as defined under CPA and would it include service promised online and delivered offline.

IT (Amendment) Bill, 2006

The IT (Amendment) Bill, 2006, was introduced in the Lok Sabha (Lower House of the Parliament) on December 15, 2006 by Union Minister of State for Communication. According to 'Statement of Objects and Reasons' of the Bill the purpose of the legislation is (1) harmonization of electronic communication and services with the Information Technology Act (2) protection of Critical Information Infrastructure (3) to suggest penal provisions in the IT Act, Indian Penal Code, Indian Evidence Act, and the Code of Criminal Procedure to prevent the publication of sexually explicit material, video voyeurism, breach of confidentiality and leakage of data by intermediaries, e-commerce fraud like personation (phishing), identity theft, and transmission of offensive materials through communication services. The bill also seeks to enable the government to authorize service providers to collect service charges from customers as specified by the government.

The Government of India proposes to make substantial change to the *IT Act, 2000* with regard to the power to order interception and monitoring. As per the present law the power to order interception or monitoring is with the Controller appointed by the government. However, the Section 69(1) of the *IT (Amendment) Bill, 2006*, has taken away the power of the controller and empowers the government to direct any of its agency to 'intercept or monitor or decrypt or cause to be intercepted or monitored or decrypted any information transmitted through any computer resource'. According to the bill, the government should take such a decision only 'in the interest or integrity of India, defense of India, security of State, friendly relations with foreign States or public order or for preventing incitement to the commission of any offence'.

Clause 3 of the same section directs the subscriber, intermediary or any person in charge of the computer resource to extend all facilities to the investigating agencies. They must provide access to the computer resource containing such information, intercept or monitor or decrypt the information and also provide information contained in the computer resource. Any subscriber or intermediary who fails to assist the agency will be liable for imprisonment up to seven years.

The bill also allows the government to notify or declare any computer resource which directly or indirectly affects the facility of Critical Information System to be a protected system. The Critical Information Infrastructure means 'the computer resource, the incapacitation or destruction of which, shall have debilitating impact on national security, economy, public health or safety'. It is up to the government to prescribe the information security practices and procedures for such a protected system. The Indian Computer Emergency Response Team (CERT-In) will be set up to serve as the national nodal agency in respect of the Critical Information Infrastructure for coordinating all actions relating to information security practices, procedures, guidelines, incident prevention, response and report. The director of the CERT-In has been given the power to call for information pertaining to cyber security from service providers, intermediaries or any other person. Anyone who does not cooperate with the CERT-In will be liable for imprisonment up to one year, for a fine up to Rs. 100000, or both.

Computer-related Crimes

Section 43 of the principal Act (*IT Act, 2000*) deals with computer-related crimes including unlawful access to computer resources, sending computer virus, damage computer systems or disrupting communication systems, denial of authorized access to computer resources to someone, manipulation of electronic money transfer. Section 66 deals with hacking while Section 67 deals with publication of obscene materials in electronic form. According to the new bill both Section 66 and Section 67 of the principal Act will be totally substituted by new ones. Section 66 of the proposed legislation deals with computer-related crimes and according to it 'If any person, dishonestly or fraudently, does any act referred to Section 43, he shall be punishable with imprisonment for a term which may extend to two years, or with fine which may extend to five lakh rupees, or with both'. Section 66A, makes sending offensive messages punishable which reads 'any person who sends, by means of a computer resource or communicative device that is

> (a) grossly offensive or has menacing character; or (b) any content which he knows to be false, but for the purpose of causing annoyance, inconvenience, danger, obstruction, insult, injury, criminal intimidation, enmity hatred or ill-will shall be punishable with imprisonment for a term which may extend to two years and with fine.

In order to prevent computer-related crimes and protect sensitive data The IT Bill, 2006 proposes to insert a new Section (43A) to make IT companies and service providers make it mandatory to put in place reasonable 'security practices and procedures' protection of sensitive personal data. Section (43A) says,

> Where a body corporate, possessing, dealing or handling any sensitive personal data or information in a computer resource which it owns, controls or operates, is negligent in implementing and maintaining reasonable security practices and procedures and thereby causes wrongful loss or wrongful gain to any person, such body corporate shall be liable to pay damages by way of compensation, not exceeding five crore rupees to the person so affected.

Section (43A (ii)) also suggests the government discuss with various stake holders how to define 'reasonable security practices and procedures' as reads,

> 'security practices and procedures designed to protect such information from unauthorized access, damage, use, modification, disclosure or impairment, as may be specified in an agreement between the parties or as may be specified in any law for the time being in force and in the absence of such agreement or any law, such reasonable security practices and procedures, as may be prescribed by the Central Government in consultation with such professional bodies or associations as it may deem fit.

As per the new bill the punishment for computer-related crimes will be reduced to two years imprisonment which was three years in the principal Act. However, fine has been increased from Rs 2 lakhs to Rs 5 lakhs.

Even though the new bill has widened the scope for the punishment for computer-related crimes, it does not address issues such as spam whereas the US has passed a separate anti-spam legislation.

Identity Theft & Personation

The proposed legislation seeks to amend the Indian Penal Code to prevent identity theft and cheating by impersonation by using information and communication technologies. The amendment (Section 417A) targets 'whoever, cheats by using the electronic signature, password or any other unique identification feature of any other person, shall be punished with imprisonment of either description for a term which may extend to five years and shall also be liable to fine'. According to Section 419A, anyone cheats by personation by using any computer resource or communication device will be liable for imprisonment up to five years and he/she shall also be liable to fine.

Publication of Obscene Material & Sexually Explicit Act

Publication or transmission of obscene material will continue to be punishable under (Section 67) but the punishment has been diluted. In the principal Act anyone who commits offence under Section 67 was liable for imprisonment up to five years but in the new bill it has been reduced to two years. The guilty will also be liable for a fine up to Rs 500000 upon first conviction. In the event of second or subsequent conviction the punishment can be up to five years imprisonment and also with a fine which may extend to Rs 1000000. In the principal Act anyone convicted in the second time is liable for 10 years of imprisonment.

In the new Bill a new Section 67 has been included to deal with publication or transmission of sexually explicit acts in electronic form which covers child pornography. According to this section,

Whoever publishes or transmits or causes to be published or transmitted in the electronic form any material which contains sexually explicit act or conduct shall be punished on first conviction with imprisonment of either description for a term which may extend to five years and with fine which may extend to ten lakhs rupees and in the event of second or subsequent conviction with imprisonment of either description for a term which may extend to seven years and also with fine which may extend to ten lakhs rupees.

Book, pamphlet, paper, writing, drawing, painting is exempted from liability if the publication of which is 'proved to be justified as being for the public good'. Publication or transmission of materials which is in the interest of science, literature, art or learning are other objects of general concern or which is kept or used bona fide for religious purpose are deemed to be of public good.

Intellectual Property Rights

The IT Act, 2006 has been subordinated by inserting a new clause in Section 81 of the principal Act which says, 'Provided nothing that contain in this Act shall restrict any person from exercising any right conferred under the Copyright Act, 1957 or the Patents Act, 1970. This means any complaint with regard to violation of Intellectual Property Right will be dealt according to the provisions of the Copyright Act or Patent Act.

ITC's eChoupal[10]

The eChoupal is a multilingual, web-based e-procurement solution providing comprehensive information targeted at the farmer. It is a pioneering techno-business initiative of ITC Ltd and is part of **ITC's rural development initiatives**[11]. A pet project of the ITC Chairman, Mr. Y.C. Deveshwar, the ITC's eChoupal initiative was conceived by a team from ITC IBD (ITC International Business Division) headed by the ITC IBD CEO, S. Siva Kumar. IBD is the agricultural commodities export division of ITC. IBD was under pressure from ITC to boost its contribution to ITC's net turnover in a market with intense competition and narrow margins. Taking up the challenge head-on, the IBD's top managers carefully studied the existing procurement process for commodities from Indian farmers and concluded that something drastic was required for this supply chain to be streamlined.[12]

The existing supply chain was typically "Village->Mandi->ITC Factory/Warehouse". Some of the irregularities in this scheme were:

- Farmers had only one option to sell their produce—The Mandi. The Mandi was disorganized and run by middlemen, who often cheated the farmers in terms of weight and in terms of price.

[10] Case prepared by A.Vijayshankar, PM&IR student of XLRI
[11] http://www.itcportal.com/ruraldevp_philosophy/transforming.htm
[12] http://www.itcportal.com/newsroom/press_jan18_04.htm

- Farmers were usually in the dark about the meteorological information that is so crucial during the sowing time. The available information was usually too generic in nature.
- Farmers were unaware of the latest techniques in farming, soil analysis, fertilizer application, etc. As a result, crop yields were much lower than in other developed countries.

Most importantly, they were unaware of the actual prices at which middlemen sold their produce. As a result, they had to accept whatever prices were offered to them. In May 1999, the eChoupal plan took concrete shape. The Choupal is a common place in a village where farmers and villagers gather after a day's work to discuss their activities and share knowledge. ITC decided to launch a revolution at the grass roots level, based on this age-old knowledge sharing concept of the Choupal.

Soya bean and soya-related products formed the basis of the IBD's business in 1999. Madhya Pradesh was the state producing the largest quantities of soya bean. The eChoupal was rolled out, as part of the initiative called *www.soyachoupal.com*.

As per this concept, each village was provided with a computer kiosk containing the following:

- A PC
- Connection lines—telephone-based modems, or VSAT terminals
- A UPS powered by solar energy
- A printer

Technology and Logistics[13]

Challenges. The challenges posed are:

- Low availability of electric power and lots of fluctuations in supply
- Transportation issues—reaching equipment and technicians into remote areas
- Telecom infrastructure—very poor quality. Designed only for voice, not data
- An alien customer base—almost 100% computer illiterate consumer base

System specification. A four-layered IT infrastructure model was conceived. It consisted of:

- Organizational—training, support, planning, people, and processes
- Information—data gathered and managed
- Application—application, goals, resources occupied, performance metrics
- Technical—servers, clients, network, system software

ITC set up a special telecom infrastructure using tweaked C-DOT RNS kits to get a data throughput of 40 kbps and used a modem. In places where the telephone connectivity was absent, VSATs were used for data communication. Spike suppressors and isolation transformers were used along with the UPS to provide smooth, uninterrupted power.

[13] www.digitaldividend.org/pdf/eChoupal_case.pdf

The software consisted of a multilingual word processor called *Ankur* to provide a vernacular graphical interface for farmers. The PC also had video clips on soil testing.

To overcome logistical issues, mobile vans were used to demonstrate and popularize the system through road shows. They also carried technicians to install and support the system.

System Software Development

The system was developed by ITC Infotech India Ltd., a 100 per cent subsidiary of ITC, using Microsoft technologies—primarily ASP and VB components on an IIS server. HTML is used for presentation and an RDBMS is used at the backend.

The system is linked to ITC IBD's ERP so that transactions can be updated into the system on a real-time basis.

Of the Farmer, by the Farmer, for the Farmer

A literate member of the farming community is chosen as the **Sanchalak**, or coordinator, on behalf of the village. The Sanchalak accesses the site on behalf of the farmers and explains the features of the site and provides them with the relevant information that they want.

Each such Sanchalak is given a user name and password to access the system. Besides serving as an authentication, the user name-location mapping ensures that information is location-specific, making the process more relevant and specific.

ITC pays for the installation cost, the equipment, support and equipment maintenance, while the Sanchalak pays for the day-to-day charges such as electricity and internet. Sanchalaks make a commission of 0.5 per cent per ton of processed product that they get the farmers to sell to ITC.[14]

Before the eChoupal came up, there were commission agents who used to pick up grains from the farmer at the mandis on behalf of ITC. They were given the new role of **Samyojaks**, or facilitators. The Samyojaks help establish eChoupal kiosks in villages falling within their geographical area. They help in selecting and training Sanchalaks in the villages. They also organize activities at the ITC hubs and warehouses and sell ITC products directly to the farmers when they come to sell their produce. Samyojaks get a commission for this from ITC. In this way, ITC has appeased their older commission agents as well. Sanchalaks and Samyojaks in particular regions are called for meetings/workshops on a regular basis.

The eChoupal concept is **a big hit with the farmers** for the following reasons:

- ITC puts up its offer prices on the site. Farmers can obtain information about other offers and make an independent decision about where they want to sell their produce.

[14] http://poverty.worldbank.org/files/14647_E-choupal-web.pdf

- In the traditional system, the farmer is obliged to go to the Mandi whenever the sales/auctions take place. The eChoupal system gave the farmer an option to sell his produce to ITC anytime he wanted.
- The transparency in the system was there for farmers to see. There was no word-of-mouth communication of prices. The prices were on the site in writing.
- The system is multilingual, so the farmers can actually read what is presented on the screen. Hence the system is used rather comfortably by farmers.
- The entire system is used by the villagers with the sanchalak himself being another villager, so the degree of ownership is very high.

ITC has thus provided the farmer an option which he never had before. By directly interacting with the farmer, ITC now has the opportunity to obtain the quality produce that it desires. ITC set up a well-connected network of warehouses and hubs to receive and store the produce and paid the farmer on the spot for his produce. A **very effective e-procurement model** as depicted in Figure 1.4 was thus created.

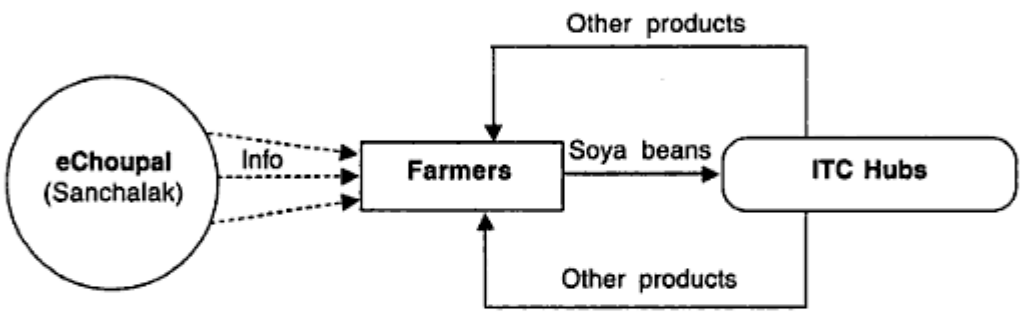

Fig. 1.4 An e-procurement model.

A Wealth of Information

The eChoupal gives farmers a lot of relevant information. This includes the following[15]:

- Weather information
- Best farming practices
- Market information
- Crop information
- Questions and answers and answers to frequently asked questions (FAQ)
- Soil testing
- Feedback
- Farmer information
- Information on state and central government schemes
- News

[15] http://www.eChoupal.com/home/Sitemap.asp

Extending the Internet

After the success of www.soyachoupal.com, ITC decided to venture into pruning the supply chain of other commodity exports. As a result, www.aquachoupal.com for aquaculture and www.plantersnet.com for coffee were started. Similar initiatives have been considered for optimizing the procurement of wheat[16] and horticultural products.

Marketing Goes Rural

In addition to acting as an e-Procurement model, ITC has started leveraging this eChoupal infrastructure to broaden its distribution network into the rural heartland as well.

ITC is in a position to sell products allied with agriculture such as fertilizers, agrichemicals and seeds. ITC's subsidiary, Megatop, sells insurance to the farmers. Credit schemes for farmers are also on the anvil for those who feel exploited by banks.

In addition, ITC has started using the eChoupal as a network for marketing their range of goods in the Food and FMCG sector, such as edible oils (from soya), salt, biscuits, confectionary, etc.

It is also in a position to auction its infrastructure to other companies that desire to penetrate the rural markets. For example, BPCL has started using the eChoupal to sell LPG cylinders in Madhya Pradesh and Uttar Pradesh.[17]

Future Plans

'e-Choupal' is already benefiting over 2.4 million farmers with over 4100 e-Choupal installations covering 21,000 villages in 6 states—Madhya Pradesh, Uttar Pradesh, Rajasthan, Karnataka, Maharashtra and Andhra Pradesh. Over the next decade, the e-Choupal network will cover over 100,000 villages, representing 1/6th of rural India, and create more than 10 million e-farmers.[18]

ITC intends to help create an active and dynamic community of farmers. Initially started with a Click & Mortar/Aggregator model, the e-Choupal is maturing into the role of an online service provider by opening its infrastructure for use by other companies. There are plans to lend the system a B2C perspective through which the farming community can actually use the system to trade online.

Case Discussion

The following need to be discussed:

1. Discuss the impact ITC can make for the rural sections of the country through eChoupal.
2. What is innovative about eChoupal?
3. Identify the difficulties that eChoupal may face.
4. What are the other areas where the eChoupal concept may be applied in rural India?

[16] http://www.itcportal.com/newsroom/press_jan16.htm
[17] http://www.eChoupal.com/NewsRoom/Press/news2.htm
[18] http://www.echoupal.com/NewsRoom/Awards/news3.htm

S. Kumars: skumars.com[19]

S. Kumars Online Ltd. (SKOL) is the infotech thrust of S. Kumars Group. Its primary mission is to provide technology to the common man. By setting up a nation-wide network to facilitate e-commerce, even the smallest villages in India will have access to the urban centres, and the world. *skumars.com* network will overcome the constraints of inadequate cable infrastructure, shortage of personal computers and validation of transactions critical for e-commerce to flourish. *skumars.com* network is supposed to create new opportunities for the business and trading community and prove beneficial to all concerned—the consumer, the trader, the manufacturer and to the shareholders of the company.

This business model involves setting up a network of VSAT enabled franchisees, spread all over India. A VSAT (Very Small Aperture Terminal) is a dish that allows the computer to directly connect to the central SKCL site through a satellite. This network is expected to be extremely customer friendly, allowing even the smallest consumer, service provider and trader to buy economically or provide services to a larger market, thereby providing everyone with the twin advantages of convenience and economy. The salient feature of the business is that virtually everyone can be a customer of the network. In a country where credit cards are used by less than 0.5 per cent of the population, SKCL will enable every Indian to transact, pay in the most accepted mode of payment—cash—and reap the benefits of e-commerce. The trading community has an integral role to play in enabling this vision. It is the franchisee network, which will provide the means to every customer to transact, irrespective of whether the consumer has a credit card or access to a personal computer.

Consumers, traders and suppliers will come to the franchisee outlets and use the network for accessing information, buying, selling, and communicating. Millions of individuals are expected to have access to the latest technology and e-commerce.

Their model is one of its kinds, to be executed all over India through franchisees. They have over 1200 franchisees spread over the country, connected through the Internet. These franchisees are also known as business partners who sell through kiosks. The customer goes to the franchisee, browses, places an order, and the franchisee delivers the goods.

The company has been through some major problems: low hits, poor availability of the medium itself (the Internet), the payment mechanism, customer awareness, decreasing franchisees, etc. The most unique part about the site is that it is an integration of the online and offline concepts, and the fact that they sell purely Indian products (anything that you can think of...right from 'rakhees' to 'ganga jal') and are very well integrated and spread across the country to ensure customer satisfaction!

[19] http://www.skumars.com

What Do They Offer?

- *A nationwide trading system.* Now you can buy and sell anything from anywhere in India.
- *The power of information.* All the information you need is available at the click of a button.
- *The convenience of education.* Top-of-the-line education in over 1000 cities and towns.
- *Employability options.* A nationwide network to access, identify, and train individuals.

The single largest benefit of the skumars.com Ltd. (SKCL) network is that it has been designed to offer almost everything that its users would want from it. For example, if there is a customer who wants to sell a product, all that he has to do is to place a small (extremely low cost) advertisement at the outlet. He can specify the product, the location and the price.

If another consumer wants to buy something (anything actually), all that he has to do is to go to his nearest SKCL franchisee, browse the SKCL network, select the items from the various locations on the basis of his budget and place the order, all sitting at the franchisee outlet.

One can also enroll and participate in the best of educational courses sitting in one's neighbourhood. Transaction of shares, job market opportunities, astrological forecasts, and real estate information is also available on the network.

The various services offered to the consumer under B2C are as follows:

1. ***Hospitality.*** The network will give information and choice to aid decision-making. Rent rooms/conference halls/villas and lots more, across 2000 towns and cities.
2. ***Travel & tourism.*** Worry-free holidaying made possible at competitive prices. The network will offer tours to match budgets. Mapping information (road as well as city) on how to reach various destinations will also be available.
3. ***Education.*** School and college education, computer-based education like C programming, Java, RDBMS and networking, professional courses for CA/IIT/MBA/medical entrance exams, secretarial courses and preparatory courses for banking and insurance exams. A variety of tests for evaluating various skills will also be offered.
4. ***Financial products.*** Retailing of equity and debt instruments, banking products, mutual funds, insurance products, loan syndication for consumers and other individual loans.
5. ***Gifts and e-greetings.*** Sending gifts to friends and relatives anywhere in India or receiving them from anyone overseas. If spending on a gift is expensive, one can simply send an e-greeting. It may actually cost next to nothing.
6. ***Online shopping.*** Consumer electronics, jewellery, handicrafts, white goods, apparel, accessories, specialty foods, packaged foods, and lots more.

7. ***Alternative medicine.*** Information on ayurveda, the vedic manner of healing the body with incantations and herbs. Advise on naturopathy and other alternative systems of healing.
8. ***Real estate.*** Access to information about real estate options throughout the country.
9. ***Entertainment.*** Downloading the latest music videos/audios, cinema updates and reviews. Booking tickets to the movies in town.

Problems

There could be a problem with *skumars.com*, because they are into too many things. They are not market leaders in a lot of services, and their market share thus would be low. Also, diversifying into so many areas, gives them a whole range of competitors, and they cannot focus on any one line and excel there.

Case Discussion

The following points need to be discussed:

1. What are the drawbacks of the SKOL model?
2. What are the difficulties encountered with the SKOL model compared to eChoupal?
3. Find out the latest business statistics about *skumars.com*.
4. Compare the eChoupal concept with *skumars.com* which did not take off well. Compare and contrast the different models in these two businesses.

EXERCISES

1. Find the most recent information on *amazon.com* and comment on its battle with Barnes & Noble.
   (a) Enter the amazon's site and print a list of current books on e-commerce.
   (b) Find a review of one of these books.
   (c) Review the services you can get from amazon and describe all the benefits you can receive.
   (d) Enter the Barnes & Noble website (*www.bn.com*) and compare it with *amazon.com*.
2. What are the key differences between traditional commerce and e-commerce?
3. What are the developments that have contributed to the emergence of the Internet as an electronic commerce infrastructure?
4. Go to *sify.com* and find out all the information that you can get on this website.
5. What is the difference between EDI and e-commerce?
6. After reading the case on eChoupal, suggest means through which e-commerce can be applied to India's rural economy.

7. For each of the following items, locate two websites in India that sell them:
   (a) airline tickets
   (b) personal computers

8. Make a study of HDFC banking services on the Internet. A brief summary is given in the following paragraph:

   HDFC BANK—E-broking through the Internet

   HDFC Bank is said to be looking at Internet banking as the medium between the bank and the consumer. The bank's services can be split into two areas. One is the area where people need to access data about their accounts and the other area concerns transactions. The bank intends to secure more and more transactions like issuing cheques or opening accounts via the Internet so that its staff will be free to do more value-added work.

   To get more account holders to bank online, HDFC Bank is setting up a shopping mall. The users will access these malls through the bank site, the money will be debited directly from their account. Thus, it will cut out the security aspect which such shopping malls face. It also plans to offer e-broking services online which is expected to bring in more customers. HDFC Bank has already picked up well since it started these services in September 2000 with 1000 users. It currently has about 20,000 users out of its 2.75 lakh savings account holders. It is now targeting to 100,000 customers.

9. Make a study of Elbee Services and Blue Dart and find from their websites the success and popularity of their business. A brief summary of their respective business is given below:

   1. *ELBEE SERVICES—End-to-End Solutions*

   A major player in the courier industry, Elbee Services has also launched *elbeenet.com*, a customized product providing end-to-end solutions for e-business for both B2B and B2C transactions. Elbee collects consignments from the vendors and delivers them to the addressees. The company also collects the value of the consignment from the receiver if required. The customers can track their consignments through the Elbee website.

   The company intends to offer single-point interface and increased geographical and market reach. Customers will also benefit through reduced overheads, a virtual inventory, a standardized distribution cost and high levels of service and recoveries.

   Elbee had aimed to corner about 55 per cent of Rs 500 crores logistics market which in value terms worked out to an incremental turnover of Rs 275 crores by 2002.

   2. *BLUE DART—Rapid Delivery through the Internet*

   Recognizing the business opportunities of the future, Blue Dart has prepared a comprehensive plan to maximize the potential which e-commerce will offer to a courier service. The company is largely banking on the delivery side.

   The company believes that e-commerce is opening up more opportunities on the B2C side. In the B2C segment, the capacity to deliver to the residence is critical.

To cash in on this, the company is increasing its warehousing capacity and has recently opened a 10,000 sq. feet warehouse in Chennai. It has an intranet in place which connects over 1000 terminals through Vsat, interfaced together by communication systems. This is to help a customer track his shipment.

Blue Dart now wants the customer to use the technology it has set up. "Instead of just adding an edge within the company and adding exponential growth we want our customers to use it by putting it on the Internet", so says a company spokesman. Blue Dart is already doing business with portals like Rediff and Fabmart among others. Here again the company intends to interface its own system with that of its customers.

CHAPTER 2

Business Models for E-commerce

A business model is the method of doing business by which a company can sustain itself, that is, generate revenue. The business model spells out how a company makes money by specifying where it is positioned in the value chain.

Some models are quite simple. A company produces goods or services and sells it to customers. If all goes well, the revenues from sales exceed the cost of operation and the company realizes profit. Other models can be more intricately woven. Radio and television broadcasting is a good example. The broadcaster is part of a complex network of distributors, content creators, advertisers, and listeners or viewers. Who makes money and how much, it is not always clear at the outset. The bottom line depends on many competing factors.

However, a business model does not discuss how the business mission of the company will be realized. The marketing strategy of the company is needed to assess the commercial viability of a business model and to answer questions like the following: How is competitive advantage being built? What is the positioning? What is the marketing mix? Which product-market strategy is followed? and so forth.

For our understanding, e-commerce can be defined as any form of business transaction in which the parties interact electronically.[1] A transaction in an electronic market represents a number of interactions between parties. For instance, it could involve several trading steps, such as marketing, ordering, payment, and support for delivery. An electronic market allows the participating sellers and buyers to exchange goods and services with the aid of information technology. Electronic markets have three main functions such as: (i) matching buyers and sellers, (ii) facilitating commercial transactions, and (iii) providing legal infrastructure. Information technology permeates all the three functions and also helps to increase market efficiency and reduce transaction costs. The interaction between participants is supported by electronic trade processes that are basically search, valuation, payment and settlement, logistics, and authentication, as shown in Figure 2.1. The Internet and the World Wide Web allow companies to efficiently implement these key trading processes. For instance, many search services and brokers are available to help buyers find information, products, and merchants in electronic markets.

[1] Menasce D.A., *Scaling for E-business*, Prentice Hall PTR, NJ, 2000.

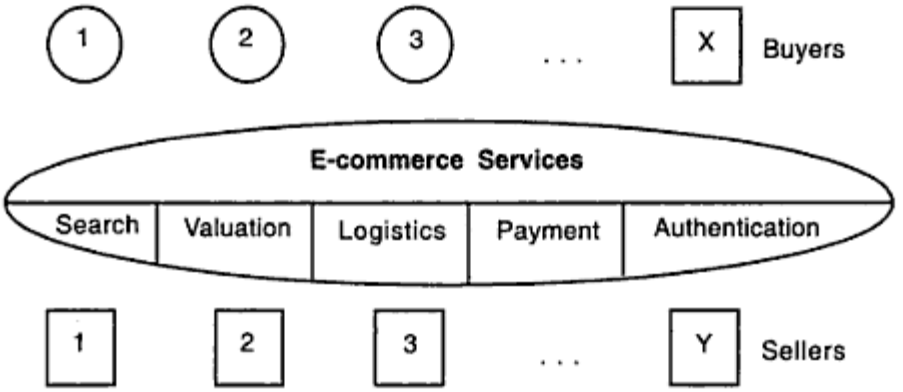

Fig. 2.1 Representation of an electronic market.

E-commerce can be formally defined as technology-mediated exchanges between parties (individuals, organizations, or both) as well as the electronically-based intra- or inter-organizational activities that facilitate such exchanges.[2] It is global. It favours intangible things—ideas, information, and relationships. And it is intensely interlinked. These three attributes produce a new type of marketplace and society, one that is rooted in ubiquitous electronic networks.[3]

The effectiveness of an e-commerce website is measured through the various parameters that constitute the Web usage analysis for e-commerce. The return on investment is a major cause of worry for the Web merchants. The Web channel provides new opportunities and challenges for analysis. It collects a large amount of detailed information on every user action. There is little experience and knowledge of the end-to-end process—from identifying what usage analysis is interesting to an organization, and what needs to be tracked down and measured, to acting on analysis for revising Web content, and updating advertising and promotion strategies.[4]

A company's business model is the way in which it conducts business in order to generate revenue. In the new economy, companies are creating new business models and reinventing old models. Reading the literature, we find business models categorized in different ways. Presently, there is no single, comprehensive and cogent taxonomy of Web business models that one can point to. Although there are many different ways to categorize e-business models, they can be broadly classified as follows:

1. E-business model based on the relationship of transaction parties.
2. E-business model based on the relationship of transaction types.
3. Classification by revenue model. A revenue model may comprise: (a) product sales model that charges customers directly for the products or services they buy; (b) subscription model that charges a fixed monthly or annual rental for the service; (c) transaction fee model that charges a service fee based on volume and value of the transactions offered; advertising support model that charges advertisers instead

[2] Jeffrey F. Rayport and Bernard J. Jaworski, *E-Commerce*, Tata McGraw Hill, 2002, p. 3.
[3] Kevin Kelly, *New rules for the new Economy*.
[4] Stephen Gomory et. al., *E-Commerce Intelligence: measuring, analysing and reporting on merchandising effectiveness of online stores*.

of charging users; and sponsorship model that provides sponsorship by companies for non-financial reasons.

4. Classification by distribution channel. A distribution channel may comprise: (a) direct marketing where manufacturers such as Dell, Nike, Lego or Sony market directly from company sites to individual customers; (b) pure play e-tailers who have no physical stores, only an online sales presence. *Amazon.com* is an example of such a model; and (c) click-and-mortar retailers who are traditional retailers with a supplementary website, like *Walmart.com*.

In Figure 2.2, many of the entities of these models have been assembled together and given the name e-commerce.

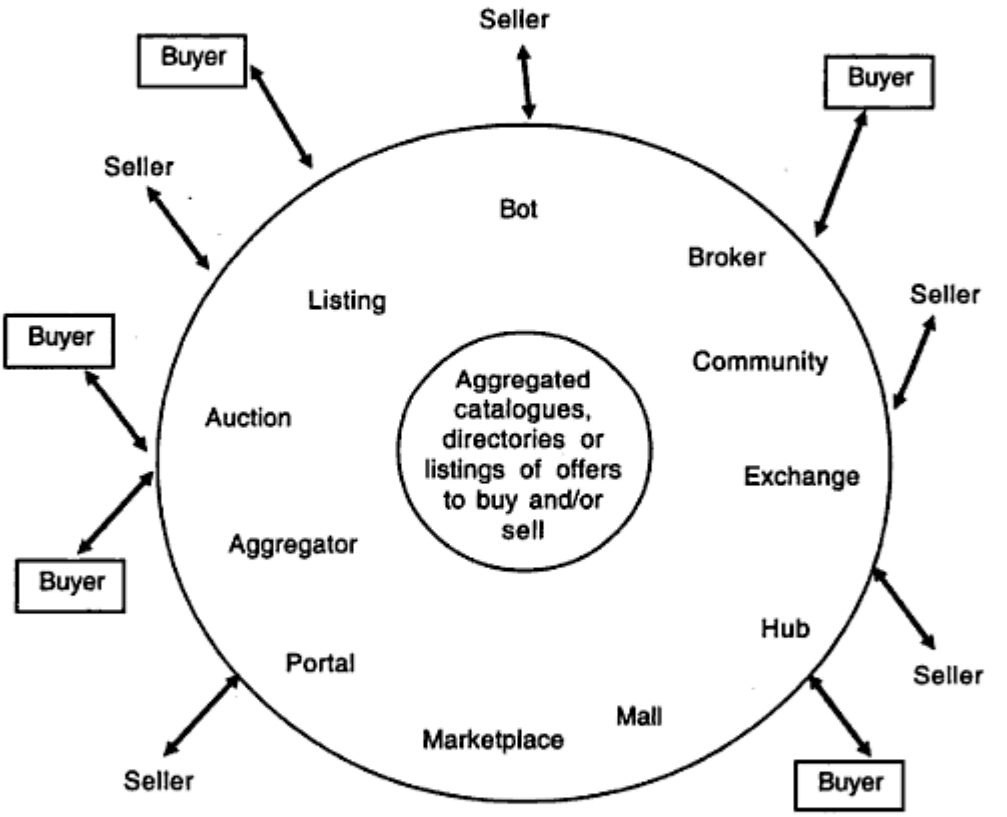

Fig. 2.2 Representation of e-commerce marketplace.

A business model can be defined as an architecture for product, service, and information flow, including a description of business players, their roles, and revenue sources. For example, some of the most popular revenue-generating models adopted by companies are: (i) charge fees for advertising, (ii) sell goods and services, (iii) sell digital contents, and (iv) charge for processing the transactions that occur between two parties on the Web. E-commerce models can be perceived in the form of relationship between two entities such as:

- Direct marketing versus indirect marketing
- Fully cybermarketing versus partial cybermarketing
- Electronic distributor versus electronic broker
- Electronic store versus shopping mall
- Generalized e-malls versus specialized e-malls
- Proactive versus strategic cybermarketing
- Global versus regional marketing
- Sales versus customer service.

And the list will go on. However, it is possible to classify e-business models according to this criteria.

E-business Models Based on the Relationship of Transaction Parties

Electronic markets are emerging in various fields. Different industries have markets with different characteristics. For example, an information B2C market differs in many respects from the automotive B2B market. The former represents companies that sell digital information goods, such as news, articles, music, books, or digital videos. In the information B2C market, the electronic infrastructure not only helps match customers and sellers, but also acts as the distribution channel, delivering products to customers. In this case, the infrastructure, such as servers and networks, must support the delivery of large files, streaming media and other types of digital goods in an efficient way. This B2C market over the Internet can be viewed as an open system, where the number of participants is unknown. In the automotive B2B market, the products traded, such as parts and components of cars, have a high degree of specificity. The market infrastructure used is to be mainly based on Electronic Data Interchange (EDI) over expensive VAN services. EDI involves the exchange of standardized, structured information between organizations, permitting direct communication between computer systems. At the heart of B2B applications is the strong integration of different applications. Servers, networks, and software should provide the infrastructure to integrate Web-based applications with mainframe and legacy systems. B2B is also a closed market in the sense that the number of participants involved in trading is limited and known a priori.

Understanding the nature of the market's requirements is critical for creating the underlying e-business infrastructure. The relation between B2B and B2C models is clearly shown in Figure 2.3. B2B covers business transactions along the various interactions existing in the value chain from producers of raw materials to retailers and consumers including

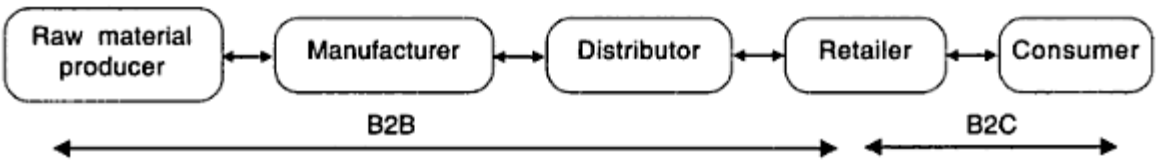

Fig. 2.3 Relation between B2B and B2C models.

manufacturers and distributors. On the contrary, B2C reflects only the interactions between a customer and a retailer. Basically, B2C transactions include the following steps: (i) account acquisition, (ii) product discovery through search and browse, (iii) price negotiation, (iv) payment, and (v) product delivery. In some cases, dispute resolution and customer services may also exist.

E-commerce can be classified according to the transaction partners such as **business-to-consumer (B2C)**, **business-to-business (B2B)**, **business-to-government (B2G)**, **consumer-to-consumer (C2C)**, and **consumer-to-business (C2B)**. Within these broad categories, there are a number of variations in the way the models are implemented. Table 2.1 summarizes some of the current e-business models. The contents of this table are illustrated in the form of a diagram in Figure 2.4.

TABLE 2.1
SUMMARY OF E-BUSINESS TRANSACTION MODELS

Model	*Description*	*Examples*
B2C	Sells products or services directly to consumers.	*amazon.com, autobytel.com, eDiets.com, Pets.com*
B2B	Sells products or services to other businesses or brings multiple buyers and sellers together in a central marketplace.	*MetalSite.com, VerticalNet.com, SHOP2gether.com*
B2G	Businesses selling to local, state, and federal agencies.	*iGov.com*
C2C	Consumers sell directly to other consumers.	*ebay.com, InfoRocket.com*
C2B	Consumers fix price on their own, which businesses accept or decline.	*Priceline.com*

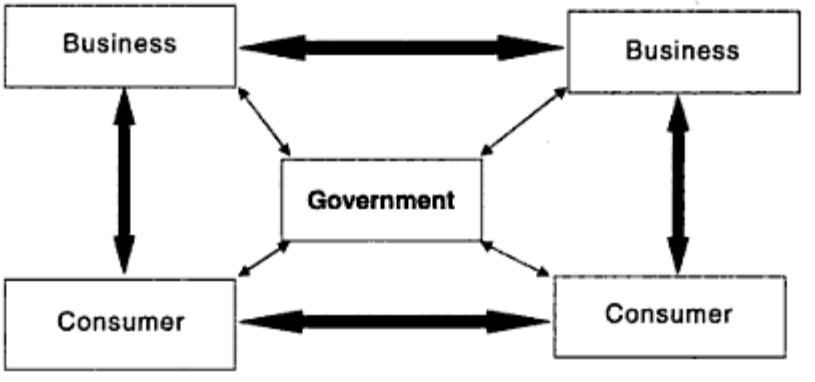

Fig. 2.4 E-business transaction model.

Business-to-Consumer (B2C)

Consumers are increasingly going online to shop for and purchase products, arrange financing, arrange shipment or take delivery of digital products such as software, and get service after the sale. B2C e-business includes retail sales, often called e-retail (or e-tail), and other online purchases such as airline tickets, entertainment venue tickets, hotel rooms, and shares of stock.

Many traditional brick-and-mortar retailers such as Barnes & Noble are now e-tailers with a Web storefront. These combined brick-and-mortar/online businesses are also known as *brick-and-click* companies.

Some B2C e-businesses provide high-value content to consumers for a subscription fee. Examples of e-business following this subscription model include the *Wall Street Journal* (financial news and articles), *Consumer Reports* (product reviews and evaluations), and *eDiets.com* (nutritional counselling).

B2C e-business models include virtual malls, which are websites that host many online merchants. Virtual malls typically charge setup, listing, or transaction fees to online merchants, and may include transaction handling services and marketing options. Examples of virtual malls include *excite.com, choicemall, women.com, networkweb.com, amazon.com, Zshops.com,* and *yahoo.com.*

E-tailers that offer traditional or Web-specific products or services only over the Internet are sometimes called *virtual merchants*, and provide another variation on the B2C model. Examples of virtual merchants include *amazon.com* (books, electronics, toys, and music), *eToys.com* (children's books and toys), and *ashford.com* (personal accessories).

Some businesses supplement a successful traditional mail-order business with an online shopping site, or move completely to Web-based ordering. These businesses are sometimes called *catalogue merchants*. Examples include *avon.com* (cosmetics and fragrances), chefs (cookware and kitchen accessories), Omaha Steaks (premium steaks, meats, and other gourmet food), and Harry and David (gourmet food gifts).

Many people were very excited about the use of B2C on the Internet, because this new communication medium allowed businesses and consumers to get connected in entirely new ways. The opportunities and the challenges posed by the B2C e-commerce are enormous. A large amount of investment has gone into this and many sites have either come up or are coming up daily to tap this growing market.

Some of the reasons why one should opt for B2C are:

1. ***Inexpensive costs, big opportunities.*** Once on the Internet, opportunities are immense as companies can market their products to the whole world without much additional cost.

2. ***Globalization.*** Even being in a small company, the Web can make you appear to be a big player which simply means that the playing field has been levelled by e-business. The Internet is accessed by millions of people around the world, and definitely, they are all potential customers.

3. ***Reduced operational costs.*** Selling through the Web means cutting down on paper costs, customer support costs, advertising costs, and order processing costs.

4. ***Customer convenience.*** Searchable content, shopping carts, promotions, and interactive and user-friendly interfaces facilitate customer convenience, thus generating more business. Customers can also see order status, delivery status, and get their receipts online.

5. ***Knowledge management.*** Through database systems and information management, you can find out who visited your site, and how to create, better value for customers.

How Does B2C Work?

B2C e-commerce is more than just an online store. It really is about managing the entire process, but just using technology as a tool for order processing and customer support. Figure 2.5 depicts the processes in B2C. The B2C process is now explained in greater detail.

1. ***Visiting the virtual mall.*** The customer 'visits' the mall by browsing the online catalogue—a very organized manner of displaying products and their related information such as price, description, and availability. Finding the right product becomes easy by using a keyword search engine. Virtual malls may include a basic to an advanced

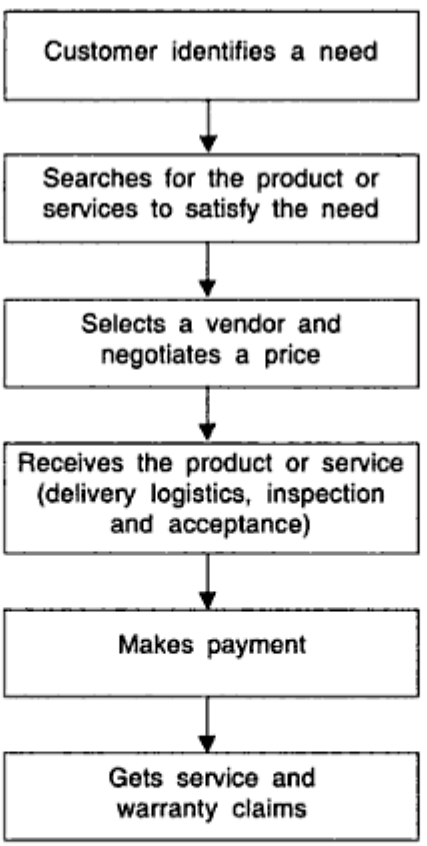

Fig. 2.5 Processes in B2C.

search engine, product rating system, content management, customer support systems, bulletin boards, newsletters and other components which make shopping convenient for shoppers.

2. ***Customer registers.*** The customer has to register to become part of the site's shopper registry. This allows the customer to avail of the shop's complete services. The customer becomes a part of the company's growing database and can use the same for knowledge management and data mining.

3. ***Customer buys products.*** Through a shopping cart system, order details, shipping charges, taxes, additional charges and price totals are presented in an organized manner. The customer can even change the quantity of a certain product. Virtual malls have a very comprehensive shopping system, complete with check-out forms.

4. ***Merchant processes the order.*** The merchant then processes the order that is received from the previous stage and fills up the necessary forms.

5. ***Credit card is processed.*** The credit card of the customer is authenticated through a payment gateway or a bank. Other payment methods can be used as well, such as debit cards, prepaid cards, or bank-to-bank transfers.

6. ***Operations management.*** When the order is passed on to the logistics people, the traditional business operations will still be used. Things like inventory management, total quality management, warehousing, optimization and project management should still be incorporated even though it is an e-business. Getting the product to the customer is still the most important aspect of e-commerce.

7. ***Shipment and delivery.*** The product is then shipped to the customer. The customer can track the order/delivery as virtual malls have a delivery tracking module on the website which allows a customer to check the status of a particular order.

8. ***Customer receives.*** The product is received by the customer, and is verified. The system should then tell the firm that the order has been fulfilled.

9. ***After-sales service.*** After the sale has been made, the firm has to make sure that it maintains a good relationship with its customers. This is done through customer relationship management or CRM.

Business-to-Business (B2B)

B2B is that model of e-commerce whereby a company conducts its trading and other commercial activity through the Internet and the customer is another business itself. This essentially means commercial activity between companies through the Internet as a medium.

This is supposed to be a huge opportunity area on the Web. Companies have by and large computerized all the operations worldwide and now they need to go into the next stage

by linking their customers and vendors. This is done by supply chain software, which is an integral part of your ERP application. Companies need to set up a backbone of B2B applications, which will support the customer requirements on the Web. Many B2B sites are company and industry specific, catering to a community of users, or are a combination of forward and backward integration. Companies have achieved huge savings in distribution-related costs due to their B2B applications.

Major Advantages of B2B[5]

1. ***Direct interaction with customers.*** This is the greatest advantage of e-business. The unknown and faceless customer including other businesses, buying the products of a large MNC like say HLL or Procter & Gamble through distributors, channels, shops and the like, now has a name, face, and a profile. Large MNCs pay a fortune for this information on customer buying patterns.

2. ***Focussed sales promotion.*** This information gives authentic data about the likes, dislikes and preferences of clients and thus helps the company bring out focussed sales promotion drives which are aimed at the right audience.

3. ***Building customer loyalty.*** It has been observed that online customers can be more loyal than other customers if they are made to feel special and their distinct identity is recognized and their concerns about privacy are respected. It has also been found that once the customers develop a binding relationship with a site and its product, they do not like to shift loyalties to another site or product.

4. ***Scalability.*** This means that the Web is open and offers round-the-clock access. This provides an access never known before, to the customer. This access is across locations and time zones. Thus a company is able to handle many more customers on a much wider geographical spread if it uses an e-business model. The company can set up a generic parent site for all locations and make regional domains to suit such requirements. Microsoft is using this model very successfully. The additional cost of serving a larger segment of customers comes down drastically once a critical mass is reached.

5. ***Savings in distribution costs.*** A company can make huge savings in distribution, logistical and after-sales support costs by using e-business models. Typical examples are of computer companies, airlines, and telecom companies. This is because the e-business models involve the customer in the business interaction to such a level that companies are able to avoid setting up the huge backbone of sales and support force, which ordinarily would have to be set up.

[5] http://www.indiainfoline.com/cyva/repo/ecom/

Tools and Techniques at the Disposal of B2B Enterprises

It is important to know the right marketing strategies, which would be required to sell successfully and profitably over the Web. The Web as a medium provides you with a unique platform to enable various strategies, which would not have been possible to execute in a conventional scenario. Some of these are:

1. ***Use of pricing as a tool.*** There is a wealth of research on pricing used as a tool to generate sales on the Internet. The biggest e-tailer of them all, *amazon.com,* made it big by giving substantial discounts. Part of these heavy discounts is attributed to the distributor level commissions, which are now being passed on to the customer. Apart from this, companies have started giving things free on the Internet in order to get a critical mass of subscribers, which helps in getting advertising revenues. The best example is the Apple IMac computer machine being given free if the buyer agrees to make a certain amount of purchase using the Apple's e-commerce website.

2. ***Use of application service provider model.*** This is an old model of the 1970s, which was used among mainframes, and dumb terminals, and which is being revisited with a vengeance. Software companies are offering their packages not in CDs and boxes but through the Web. The customer can log in over the Internet and access the software from the web server of the company and need not download it into his PC. This goes one step further in the age of the networked PCs where one need not use even a hard disk and all critical application data is kept on the Web and can be accessed from anywhere in the world. These services (which are not products) are being offered at, say, $5 an hour.

3. ***Use of generic models which are known for efficiency as well as personalized attention to various business customers.*** The Web has given rise to a new partnership between brick-and-mortar manufacturers, e-tailers, and express delivery companies like FedEx. These organizations take care of the individual elements of the customer, the order fulfillment and the post sale complaints, if any.

4. ***Use of comparison shopping.*** The Internet has brought in a whole new concept of price matching and comparison-shopping. Today there are sites, which will take you to hundreds of sites to find the cheapest product to suit your specifications. This would never have been possible without the Internet.

Business activities between companies can be transacted over an extranet. An extranet consists of two or more intranets connected via the Internet, where participating companies can view each other's data and complete business transactions such as purchasing.

Like B2C models, B2B models take a variety of forms. There are basic B2B Internet storefronts, such as Staples and Office Depot, that provide business customers with purchase, order fulfillment, and other value added services. Another B2B model is a business trading community, also called a *vertical Web community*, that acts as a central source of information for a *vertical market*. A vertical market is a specific industry in which similar products or

services are developed and sold using similar methods. Examples of broad vertical markets include insurance, real estate, banking, heavy manufacturing, and transportation. The information available at a vertical Web community can include buyer's guides, supplier and product directories, industry news and articles, schedules for industry trade shows and events, and classified advertisements. *MediSpeciality.com* (healthcare), *HotelResource* (hospitality), and *NetPossibilities* (building trades) are examples of virtual vertical marketspaces. B2B exchanges are websites that bring multiple buyers and sellers together in a virtual centralized marketspace. In this marketspace, buyers and sellers can buy from and sell to each other at dynamic prices determined by the exchange rules. Table 2.2 illustrates some common elements of B2B exchanges. B2B exchanges can be further categorized into several ways as aggregators, trading hubs, post and browse markets, auction markets, and fully automated exchanges.

TABLE 2.2
COMMON ELEMENTS OF B2B EXCHANGES

Element	*Benefit*
Centralized marketspace	Neutral and nonaligned with either sellers or buyers.
Standardized documentation	Users are prequalified and regulated.
Price quotes, price history, and after-the-sale information provided	Pricing mechanism is self-regulating.
Confidential transactions between businesses.	Clearing and settlement services provided.

B2B aggregators provide a single marketspace for company purchasing by providing many like-formatted supplier product catalogues in one place. Examples of B2B aggregators include *e-chemicals* (industrial chemicals), *Chemdex* (chemicals), *MetalSite* (steel and other metals), and *freightquote.com* (shipping services).

Trading hubs are B2B sites that provide a marketspace for multiple vertical markets. Horizontal trading hubs support buyers and sellers from many different industries. *VerticalNet* is an example of a horizontal trading hub. A pioneer in providing virtual vertical marketspaces, it maintains business trading communities for many different industries, including communications, energy, healthcare, food service, and manufacturing. Diagonal trading hubs support specific types of buyers or sellers, or specific types of products across multiple industries. *SHOP2gether.com* is an example of a diagonal trading hub.

Post and browse markets such as *CATEX* (insurance, reinsurance, and risk management), *CreditTrade* (credit derivatives), and *TechEx* (life sciences intellectual property) enable participants to post buy or sell opportunities on an electronic bulletin board. Interested parties meet through the postings and negotiate transactions for themselves.

B2B auction markets enable multiple buyers or sellers to enter competitive bids on a contract. Examples of B2B auction markets include *e-STEEL* (steel and other metals), *HoustonStrect.com* (energy), *Altra* (energy), and *Manheim Online* (auto dealer auctions).

Auction markets may include reverse auctions or "name your price" auctions. In a reverse auction, a product's selling price continues to decline until the product is purchased. "Name your price" auctions, which allow buyers to enter a bid for a product or service that a seller can then provide at the bid price, are also called reverse auctions. *FreeMarkets* is an example of a B2B site conducting reverse auctions.

Business-to-Business Transactions and Models

B2B interactions involve much more complexity than B2C. For instance, typical B2B transactions include, among others, the following steps: (i) review catalogues, (ii) identify specifications, (iii) define requirements, (iv) post request for proposals (REP), (v) review vendor reputation, (vi) select vendor, (vii) fill out purchase orders (PO), (viii) send PO to vendor, (ix) prepare invoice, (x) make payment, (xi) arrange shipment, and (xii) organize product inspection and reception. Due to the large number of transactions involved, business-to-business operations can be too risky if e-business sites cannot guarantee adequate quality of service in terms of performance, availability, and security.

Several models and classifications have been proposed for B2B commerce. Figure 2.6 illustrates an electronic marketplace for B2B trading. The model could be oriented to a vertical market (e.g. wholesale trade, chemicals, construction, and electronics) or to a horizontal approach (e.g. office supply, and logistics).

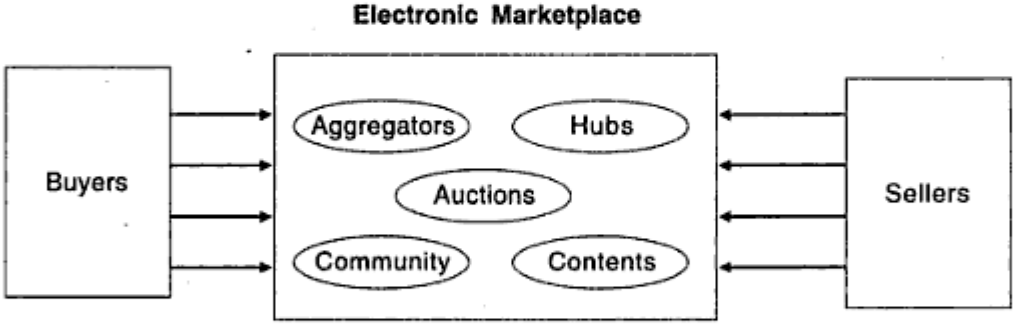

Fig. 2.6 Business-to-Business (B2B) marketplace.

The models can now be described as follows:

1. ***Aggregators.*** In the aggregation model, one company aggregates buyers to form a virtual buying entity and/or aggregates suppliers to constitute a virtual distributor. For example, in the science marketplace, one company became the central buying location for thousands of buyers to implement their own purchasing rules and obtain volume discounts. The aggregator takes the responsibility for selection and fulfillment, pricing, and marketing segmentation. Another example is an electronic company that offers a total home buying service, from search to financing, under one site.

2. ***Hubs or process integration.*** Hubs or process integration focusses on producing a highly integrated value proposition through a managed process. Hubs have been

defined as *neutral Internet-based intermediaries* that focus on a specific industry or a specific business process. Hubs host electronic markets and create value by reducing the costs of transactions between sellers and buyers. There are examples of vertical hubs that serve a vertical market or a specific industry, such as energy, steel, telecommunications, and plastic. On the contrary, functional hubs specialize in horizontal markets across different industries. Functional hubs focus on business processes such as project management and MRO (Maintenance, Repair and Operating, and procurement). An electronic business company that provides office supplies to many industries is a good example of a functional hub in B2B commerce.

3. ***Community or alliance.*** In the community model, alliances are used to achieve high value integration without hierarchical control. Members and end-users play key roles as contributors and customers. Basically, communities produce knowledge with economic value, such as Linux, MP3, and Open Source.

4. ***Content.*** Content is the end product of this model of B2B commerce. It has the purpose of facilitating trading. Revenue can be generated from subscriptions, membership, or advertising. For example, there are e-companies that sell information about contracts to bid market intelligence and analysis, and jobs by industry.

5. ***Auctions or dynamic pricing markets.*** Auctions or dynamic pricing markets handle complex exchanges between buyers and sellers in B2B commerce. Auctions (e.g. English, Dutch, Vickrey, Reverse) are dynamic and efficient mechanisms for mediating and brokering in complex marketplaces, like supply-chain and procurement systems. Bundle auctions allow agents to bid for bundles of items and are useful for B2B applications such as automatic supply-chain or procurement.

In a fully automated B2B exchange, multiple buyers and sellers competitively bid on commodities or standardized products, and the buy and sell orders are matched automatically. *PaperExchange.com* is a fully automated B2B exchange. A summary of B2B models is given in Table 2.3.

Another business model similar to the B2B exchange model is the business-to-government, or B2G procurement model. B2G e-businesses such as *eFederal.com* and *Gov.com* in the US are hoping to tap the $18 billion per year market for government procurements that do not require a bid.

Not only do businesses sell directly to consumers and other businesses online, but consumers are now interacting with each other to buy, sell, or trade products, personal services, or information.

Consumer-to-Consumer (C2C)

With the C2C e-business model, consumers sell directly to other consumers via online classified ads and auctions, or by selling personal services or expertise online. Examples of consumers selling directly to consumers are *ebay.com* (auction) and *TraderOnline.com* (classified ads).

TABLE 2.3
B2B SUMMARY

Type	*Description*	*Examples*
B2B storefronts	Provide businesses with purchase, order fulfillment, and other value-added services	*Staples.com* *OfficeDepot.com*
B2B vertical markets	Provide a trading community for a specific industry	*HotelResource.com*
B2B aggregators	Provide a single marketspace for business purchasing from multiple suppliers	*MetalSite.com*
B2B trading hubs	Provide a marketspace for multiple vertical markets	*VerticalNet.com*
B2B post and browse markets	Provide a marketspace where participants post buy and sell opportunities	*CATEX.com* *CreditTrade.com* *TechEx.com*
B2B auction markets	Provide a marketspace for buyers and sellers to enter competitive bids on contracts	*e-STEEL.com* *HoustonStreet.com* *Altra.com* *FreeMarkets.com*
B2B fully automated exchanges	Provide a marketspace for the automatic matching of standardized buy and sell contracts	*PaperExchange.com*

There are also a number of new consumer-to-consumer expert information exchanges that are expected to generate $6 billion in revenue by 2005. Some of these exchanges, such as *AskMe.com* and abuzz, are free, and some allow their experts to negotiate fees with clients. *InfoRocket.com*, one of the first question-and-answer marketplaces, is driven by a person-to-person auction format. The *InfoRocket.com* bidding system allows a person who submits a question to review the profiles of the "experts" who offer to answer the question. When the person asking the question accepts an "expert" offer, *InfoRocket.com* bills the person's credit card, delivers the answer, and takes a 20 per cent commission.

Consumer-to-Business (C2B)

The C2B model, also called a *reverse auction* or *demand collection model*, enables buyers to name their own price, often binding, for a specific good or service generating demand. The website collects the "demand bids" and then offers the bids to the participating sellers.

ReverseAuction.com (travel, autos, consumer electronics) and *priceline.com* (travel, telephone, mortgages) are examples of C2B e-business models.

E-business Models Based on the Relationship of Transaction Types

This business model is essentially ruled by the following two parameters:

On the basis of value addition. Value addition is the addition of value to a product or service because of the opportunities that it offers on the Web.

On the basis of control. At the high end of control there is hierarchical control and at the low end there is no control, so that it is self-organizing. Normally, the control is done through the policies of the website.

Based on these, nine types of transactions can be identified as listed below:

- Brokerage
- Aggregator
- Info-mediary
- Community
- Value chain
- Subscription
- Manufacturer
- Advertising
- Affiliate

These transaction types take place in a variety of ways. Moreover, any given firm may combine one or two of these as part of its Web business strategy (see Figure 2.7).

Brokerage Model

The characteristics of the brokerage model are as follows:

- The price-discovery mechanism is its key-principle.
- It is a meeting point for sellers and buyers.
- Auctions and exchanges are the modes of transactions.
- It is a 'Free Market'.
- It consists of Global Network of Buyers and Sellers.
- It is a Virtual Marketspace enabled by the Internet.
- It encompasses all types of organizations now.

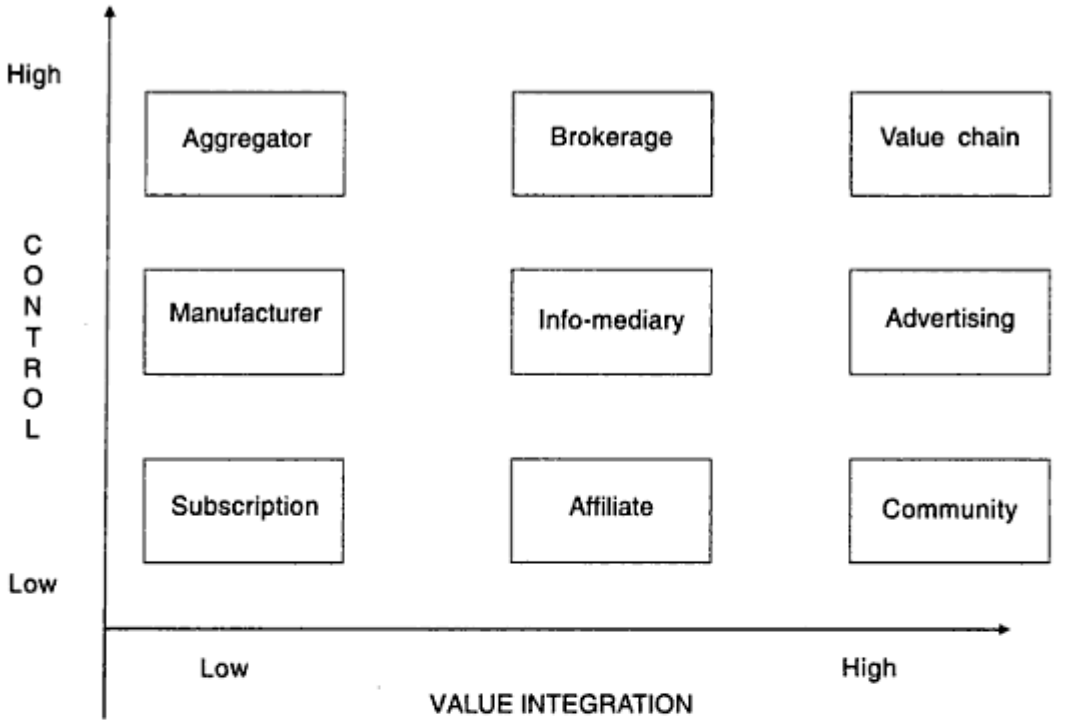

Fig. 2.7 Transaction model.

Advantages of the Brokerage Model

Following are the advantages of the brokerage model:

- C2C trading
  (a) allows buyers and sellers to trade directly bypassing intermediaries, and
  (b) reduces cost for both the parties.
- Global reach
- Trading convenience, which
  (a) allows trading at all hours, and
  (b) provides continually updated information.
- Sense of community through direct buyer and seller communication
- Efficient access to information
- Alleviation of the risks of anonymous trading.

Brokerage—Price Discovery Mechanisms

There are three kinds of price discovery mechanisms, which form the basis for the brokerage model. They are:

1. Auction
2. Reverse Auction
3. Market Exchange

Some examples of price discovery mechanism based models are:

- B2B
  - B2B sell side *FastParts.com*
  - B2B buy side *FreeMarket.com*
  - B2B exchanges *Covisint.com*
- B2C *Priceline.com*
- C2C *ebay.com*

Some Indian brokerage sites are:

www.baazee.com
www.automartindia.com
www.indiacar.com
www.steelexchangeindia.com

Of the three mechanisms listed, the first two—auction and reverse auction—can be discussed now.

Auction broker. Many different auction formats have emerged since the first auction occurred in Babylon in about 500 B.C. Today, different auction formats are aggregated on certain common attributes. There are open and sealed-bid auctions. There are auctions where the auction price ascends as the auction proceeds and there are auctions where the price descends at regular intervals. There are single auctions and double auctions.

English auction. The English auction is one of the most common auction formats. It is also known as the open-outcry auction or the ascending-price auction. It is frequently used for selling art, wine, and other physical goods, which do not have a limited lifetime.

The English auction is defined in the following way: The auctioneer starts off the auction with the lowest acceptable price or the reserve price. He then receives bids from the bidders until the point from which there is no raise in the bid. At that point, the auctioneer 'knocks down' the item, which indicates that the highest bidder will receive the item in exchange for the sum of money he bid for. Sometimes, the reserve price will not be made known to the public. This may happen when the auctioneer is uncertain about the price expectation of the bidders and when he wishes the bidders to totally set the price level. As a consequence of not giving the reserve price, the item will never be sold if the highest bid is lower than the reserve price.

The bidders are often anonymous, especially if the bidding occurs through electronic means. This is done to preserve the identity of the bidders. A well-known bidder may increase the price expectation of the product just because a person known to him has entered a bid. He may be his business rival. Therefore this kind of bidding will not be beneficial for the bidders. The seller might benefit from a 'non-anonymous' bidding process, if he wants to acquire the highest price possible. We must nevertheless keep in mind that some bidders might not join this bidding process, which can result in a lower final price for the seller.

In a traditional physical auction, the auctioneer can highly influence the bidding process. He can manipulate bidders with his voice, his gestures, and his personality. Manipulation can

to know each other, discuss topics of mutual interest, and petition one another for information. These bulletin boards are public forums that encourage open communication between users. eBay also encourages open and honest communication between the community and the company. Frequently, the members of the community organize grass-root movements to improve the environment in which they work and play. More than 60 million auctions have been completed on eBay since its inception. Figure 2.9 describes the eBay model.

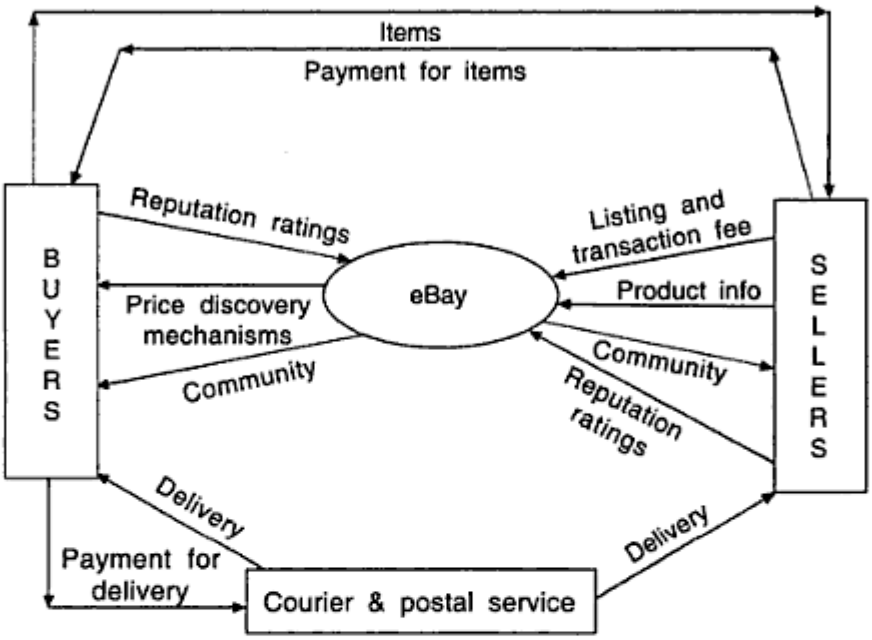

Fig. 2.9 eBay model.

The key to eBay's success is the trust between the buyers and sellers who make up the eBay community, and the trust between the user and eBay, the company. To overcome hesitancy sometimes associated with Internet commerce, eBay invented the industry's first electronic information exchange exclusive to one-to-one trading, the Feedback Forum.

How Does One Bid?

First, the user needs to register as an eBay member. The registration is free and takes only a couple of minutes. The user can then enter the auction field using his id and password. The person has to carefully look for what he is bidding on. Consider, for example, an item which costs $20.00. Enter the maximum bid in the bid box at the bottom of the page. Then, click on the "Review Bid" button. eBay will now bid on behalf of the person, up to his maximum bid. The credit card should be placed on file with eBay. The seller, for his part, can sit back (after entering his id and password) and watch the auction.

Security. You can instantly check the reputation or business practices of anyone at eBay. The Feedback Forum is a place where users leave comments about each other's buying and

There are four types of aggregators such as the following:

1. ***Content aggregators.*** They are among the first large-scale sites on the Web and mostly represent large publishing companies, e.g. *Pathfinder.com*. Their basic challenge is that content has to be attractive enough to make the site viable. For example, CANOE and Hockeyplus, that provide extensive statistics, analysis, pool information or *cricinfo.com.*
2. ***Mainstream aggregators.*** These include sites like Yahoo providing a Web directory and a search engine, along with a bunch of attractive tools like e-mail addresses, home pages, reminders, and many others. The most attractive feature of these sites is that they have an 'easy-to-remember' URL which is one of the reasons for them to be the top traffic sites on the Web.
3. ***Event aggregators.*** These are sites that provide in-depth content and tools tailored to the needs of a particular group, which doubles as a clearly defined customer base, for example, mortgages—build tools, rates, advise, and the ability to purchase a mortgage online in the same place (Microsoft's *HomeAdvisor* or *HomeShark*).
4. ***Shopping aggregators.*** Shopping aggregators let consumers roam through hundreds of sites and catalogues and find the best price in seconds. They help consumers sift through dozens of e-commerce sites. For example, *compare.com* and *bizrate.com* evaluate their quality on independent basis as in the case of consumer reports.

E-commerce is forcing changes in the distribution channels that require all parties—manufacturers, distributors, retailers, consumers and logistics companies—to evaluate their value proposition and develop capabilities that will meet the evolving demands of the Internet age.

Implications for manufacturers, other challenges and opportunities of e-commerce are that, it:

1. Requires investment in marketing directly related to the consumers so as to sustain customer loyalty to their brands.
2. Relies on consumers' support for the sale of products.
3. Requires brick-and-mortar enablers to function as a distribution centre for local delivery and returns, and for regular retail activity.

The distribution channel and logistics infrastructure remains largely unchanged for products that are either perishable or require contact with the product prior to selection.

The changes generated by e-commerce represent equally significant opportunities and challenges for logistics and transportation companies such as GATX, ASD Systems, Logistix, *Clickship.com*, and a host of others that have sprung up to leverage the capabilities of the Internet.

The implications of the model are that, for the growth of the ability to realize the potential for Internet-generated demand for delivery from local brick-and-mortar enablers, the same-day pickup and delivery infrastructure, will need to evolve rapidly. The fragmented nature of the same-day pickup and delivery service has limited achievement of delivery density, productivity and proper marketing to reduce the cost of service.

Logistics and transportation enablers who can use the same level of technology, marketing, operational planning, management talent to same-day service that has fuelled the growth of the express market, will find that the pent-up demand for this service with e-commerce models can be greater than what Frederick Smith envisioned for overnight service when he launched Federal Express.

The capabilities needed for this model are:

- Greater investment in the brick-and-mortar infrastructure.
- Handling of inbound freight for finished goods.
- Management of a more traditional distribution network with truckload and less-than-truckload deliveries to local distribution centres.
- Optimization of stores to support customer visits to view new products and to handle exchanges and returns.
- Integration of the existing retailers with the online channel for sales to e-consumers.
- Handling the same-day delivery of goods and pickup returns.

Chennaibazaar.com

Chennaibazaar was officially launched on 28th Dec. 1998, initially offering e-commerce services to Chennaites. It is a B2C gifting and a retail shopping website. This was the first shopping mall to be launched from Tamil Nadu. The name Chennaibazaar was coined, keeping in mind that its services and operations would be confined only to Chennai.

Chennaibazaar started with a listing of more than 2000 departmental products, which a Chennaite could select from and get delivered at his doorstep anywhere in Chennai, absolutely free of cost. This was a cash-on-delivery model.

In June 1999, Chennaibazaar was completely restructured to target only the Chennai-based NRIs, who could send gifts like cakes, flowers and sweets to their friends and relatives in Chennai. This concept became a major hit with a high growth rate in terms of the number of customers. Chennaibazaar.com from then onwards started to be known as the green site.

Gradually, Chennaibazaar extended this service all over India and now it is very popular among NRIs from all over the world. Though the domain says Chennai, it has extended its service to more than 45 cities all over India.

Therefore, even though the website was set up on a modest scale, its operations now are spread all over the world, mainly helping Indians living abroad to stay connected with their people and their homeland. Chennaibazaar is also now associated with Pioneer Tradings Ltd. in the United Kingdom, where it is operating in the name of *Reachhindustan.com*.

Though Chennaibazaar offers a wide variety of goods for the customer to choose from, it also provides the customers with the facility of mentioning any special commodity in their "Request a Product". Chennaibazaar then gets back to the customer to confirm whether the requested commodity can be arranged by it and what would be its price.

The commodity is also then included in their shopping cart to enable the customer to place an order for it.

Most products are purchased from the best known shops in the city, those renowned for their quality. In case a customer wants the item to be purchased from any specific place, Chennaibazaar also provides him with the facility of placing a request in their "Request a Product". The website gets back to the customer, confirming the availability and the price of executing this demand.

The website generally asks for a time period of 72 hours to complete the delivery within Chennai and for a period of 5 days otherwise, though in some special cases like delivery in taluks and villages the time span may be up to 7 days.

Since the site is an online merchant, it provides a variety of goods and services to its customers. But these goods are not their own. Once the order is placed, the company secures the products ordered from its business partners. Some of its partners in the various segments are:

- ***Perfumes:*** Avon, Gillette, Park Avenue
- ***Jewellery:*** Oyzterbay
- ***Chocolates:*** Cadbury
- ***Sarees:*** Apoorva
- ***Clothing:*** Furore, Vanford
- ***Watches:*** Casino, Titan, Timex
- ***Electronics:*** Carrier, Kodak, Godrej, Phillips, Sumeet, BPL, Samsung, LG
- ***Health checkup:*** Apollo Health Checkup.

Chennaibazar.com's Merchant Banker is ***Securetrading.com*** and they follow strict security guidelines as follows:

1. ***Digital signatures.*** Digital signatures are used throughout the system in order to ensure that transactions arriving at a gateway are from an identifiable merchant, and that any information passed back to the merchant is from a SECURETRADING gateway. Each signature uniquely identifies its source. Gateways also communicate with each other and with the control system using such digital signatures. In the event that a merchant's digital signature becomes a security risk (e.g. if their server is stolen), the appropriate signature is immediately revoked and it will no longer function within the system.

   SECURETRADING is the official Certification Authority for these signatures.
2. ***Encryption.*** All communication within the system is strongly encrypted using 2048-bit RSA encryption with variable 168-bit session keys (i.e., each transaction uses a new key). This is significantly (many billions of times) more secure than the standard browser SSL security provided by, for example, Internet Explorer. SECURETRADING encryption is also much more secure than that specified for the SET (Secure Electronic Transaction) protocol. The high level of encryption used is forecast as not being a requirement until the year 2015. The encryption is of course totally transparent to the merchant and his/her customers.

All payments are accepted through credit cards only. The credit card details are accepted through the SSL protocol. All transactions are secured, powered by CGI script capable of processing credit card transactions, ensuring that the information is encrypted before it is transmitted. The credit cards accepted are American Express, VISA, Master Card, and Discover.

Goods are delivered all over the world through FedEx. For deliveries in India, items are delivered through the courier service. Every care and precaution is taken to ensure proper quality and timely delivery of the items. Delivery is made on the date specified. Deliveries on Sunday are available only for Chennai.

Special delivery charges have to be incurred by the customer in case of deliveries to places like the USA, Canada, etc. In case of any delay in delivering the product, the company is liable only to the extent of the price of the product.

Case Discussion

1. What is the business model of Chennaibazaar.com?
2. What are the factors leading to the success of Chennaibazaar? Why did it not succumb to the dotcom crash?
3. How does Chennaibazaar fit into the aggregator model?
4. Can Chennaibazaar also fit into the auction model?

Automartindia.com

Founded in August 1999, Automartindia Ltd. is a typical brick-and-click joint venture, floated by the Mahindra Group, Mahindra Information Technology Services Ltd (MITS), Housing Development Finance Corporation (HDFC) and the established auto dealers, Sah & Sanghi. The company is headquartered in Mumbai. The company has outlets at prime locations in Mumbai, Delhi, Bangalore, Chennai and Pune.

Automartindia Ltd lists two primary objectives:

- To simplify the process of buying and selling automobiles in the Indian automotive space.
- To provide a high level of transparency and credibility in the used car market: virtues sorely lacking in the current scenario.

To this end, Automartindia Ltd. offers its customers a range of services—from choice of a certified vehicle, to certification, finance and registration, insurance, valuation, etc.—that simplify the entire process and helps them make informed sales and purchase decisions. Automartindia Ltd. is in a unique position to leverage its intrinsic strengths and create a unique alignment of the interests of purchasers, sellers, dealers, automobile associations, and manufacturers.

Automartindia recognizes that a car in the Indian context is much more than just transportation. It is a symbol of achievement, recognition of value and a major milestone

in the life of most of our target groups. Hence Automartindia has positioned itself as a companion that helps its customers achieve this milestone with the least possible discomfort.

Services Offered

The services offered by Automartindia are:

1. ***Used vehicles.*** Automartindia has the largest online inventory of used cars from over 70 cities in India. Moreover, its retail outlets are equipped to display at least 50 small, medium and premium segment cars at any given point of time.

   Towards providing credibility and transparency in the highly disorganized used car market, Automartindia Certification Program works at two levels. While the used car buyers can ensure what they pay for is what they get, the sellers can actually sell their vehicles faster by avoiding prolonged negotiations and haggling once they have put all their cards on the table.
2. ***New vehicles on the site.*** Automartindia offers its users a range of new cars—from small family cars to premium sedans. This is coupled with other helpful services like online reviews and technical statistics that users can avail of on the site. They can also run a dealer search to find the dealer closest to them.

   Perhaps the most daunting task in the transaction of a used vehicle is the paperwork that needs to be done. Automartindia ensures complete documentation at the time of procurement itself. Besides this, a check on accident history is also done. Automartindia has tie-ups with financial institutions for consumer loans.

   This product has also been developed to plug a huge need gap in the used car business. Warranty is provided for a period of 6 months or 8000 kms (which ever is first). This is provided as per the original manufacturer guidelines, thus ensuring that the same service standard is maintained for the car. This is a comforting factor for consumers of used cars. All this comes free to a consumer.

Through its "portal", Automartindia offers:

1. C2C trading: Sellers put their offerings online, buyers browse for the best possible opportunities, the buyer contacts the seller and then the two close the deal offline.
2. B2C trading: Dealers put their offerings, both new and used cars, on the website, offering special discounts. The buyers may choose from this range as well.
3. Online store: The website offers accessories online through its dealer network.
4. Physical presence: The company has a dealer network spread across the country and company-owned outlets in 5 cities, where the buyers can physically verify the condition of the cars.

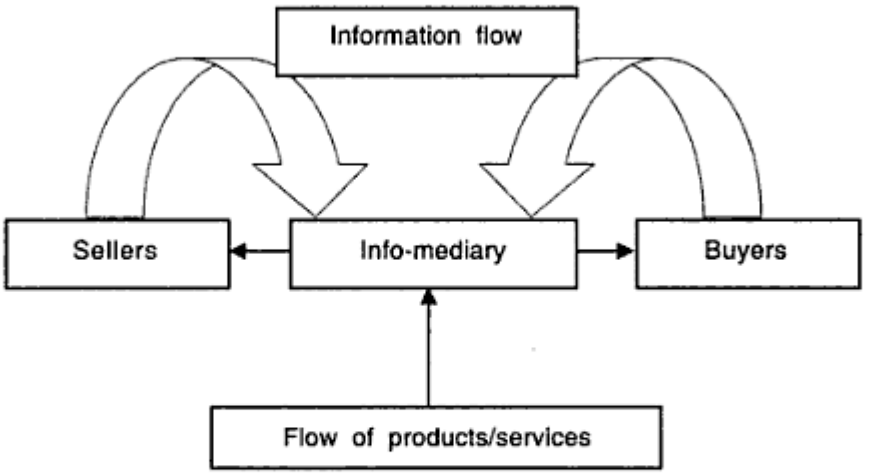

Fig. 2.12 Info-mediary model.

who could be sellers or buyers. A real info-mediary provides information services by capturing information from both sides of a transaction. They do not own the products or services that are shipped directly from suppliers to customers. Many info-mediaries today follow business models that generate revenue from the deeper pockets on the seller side. These models could be in the form of exclusive contractual arrangements whereby the info-mediary is the leader in finding customers for a seller. Membership fees for participating in an electronic market could be another source of revenue. However, more common models involve advertising revenue, whereby the info-mediary accepts payments from suppliers based on advertising (screen) space, number of user page views, and transactional revenue, whereby a certain per cent of sales goes to the info-mediary.

Buyer-based revenue sources are relatively rare but can be expected to increase over the next few years as info-mediary services become valued in online shopping environments characterized by increasing choice, complexity, and information overload. Such sources could include membership or subscription fees, allowing access to valued information or services, a transactional percentage, or fees based on services, such as connecting a seller to a buyer and ensuring privacy protection. An info-mediary front end to the Web could help protect consumers from unsolicited mailings and confusing product selection.

Value Addition

An analysis of the general info-mediary business model reveals that info-mediaries create and add value for the customer during several critical phases from the initial search of the supplier and product comparison (as to whether it fulfils the requirements) to the actual transaction and ultimate product or service delivery (sales fulfillment). To support the initial phase, info-mediaries leverage the potential of the Internet to provide almost unlimited expansion of search space for consumers, thus overcoming the limitation of physical space inherent in traditional brick-and-mortar operations. While the conventional stores carry only the most popular items, *amazon.com* offers millions of items, most of which are sought only

If you are tired of reading the same old wire news reports, recycled professional opinion, mind-numbing Bollywood brain-candy, Sulekha is for you. If you are tired of being a passive consumer of superficial fluff, Sulekha is your home. It is a democratic playing field, pulsating with an amazing diversity of opinions and creative expressions. A contributor or just a visitor, all are Sulekhe's most valuable assets.

'Sulekha' offers several ways to contribute. It does not matter if one is a total novice, everyone is welcome to contribute to Sulekha and become a member of its global family of contributors.

History of Sulekha

'Sulekha' founded in 1998, had a humble beginning. Content for the site has grown purely by word-of-mouth and the intense loyalty of its members. Online participation by thousands evidently helps make the site a vibrant, loyal and dynamic platform.

The site's Global New shopper picks up the latest news from several surfers who constantly post content. News from the world's newspapers gets posted promptly, which triggers a spate of discussions on their Coffeehouse space. Being completely interactive, posts appear instantly, leading to up-to-date comment, time differentials notwithstanding. Sulekhe's movie site has interactive reviews, and visitors to the site can soar or sink a film's rating.

The company's first published paperback, *Sulekha Select*, a collection of 42 writings, is the website's first foray into the traditional print format. Selected from about 1200 writings since 1998, this collection captures the essence of the modern Indian experience and represents individual expressions from all over the world. Interestingly, most of the contributors do not write for a living, and many happen to be engineers, where the Internet plays a dominant role. The book has also been released in India by Penguin under a different title—*Black, White and Shades of Brown*—for the Indian subcontinent and Singapore.

Sulekha's overarching mission is:

Dramatically increase the social, economic and political capital of Indians worldwide.

Sulekha realizes this goal in a profitable manner by creating a flexible and powerful, interactive platform that connects Indians worldwide through a variety of popular and powerful services. Here are some concrete examples of how it does it:

- **Social capital:** Sulekha provides the most popular platform for expression and discussions (articles/columns, Coffeehouse, Web logs) that allows exchange of thoughts and opinions. Sulekha has helped raised over $1 million/Rs 5 crores for hundreds of cultural and charitable organizations by promoting and selling tickets for their funds and events
- **Economic capital:** Sulekha runs one of the most popular online classifieds services worldwide, which allows for the exchange of products and services among Indians.
- **Political capital:** Sulekha provides a powerful platform for Indian organizations worldwide to promote and find support for petitions advocating their causes.

3. Flight insurance
4. Trip cancellation
5. Student insurance.

Case Discussion

1. How does Sulekha fit into the community model?
2. How does Sulekha create a community and offer value to its customers?
3. Determine how Sulekha is profitable for those who run it?
4. What additional features will further improve the usefulness of Sulekha?

Value Chain Model

Value chain moves businesses away from discrete streams of data about the product being made to one unified pool of information—one that even extends outside the company to suppliers and customers. The goal is to develop full and seamless interaction among all members of the chain, resulting in lower inventories, higher customer satisfaction, and shorter time to the market.

Generalized Portal: AltaVista as a Value Chain Model

AltaVista Company is the premier knowledge resource on the Internet. With its strong search engine tool and patented technology, AltaVista opens up avenues in the maze of Internet to the richest and the most relevant information on any subject from any nook of the Web world, Web pages, shopping, up-to-the-minute news, live audio and video, and community resources.

By capitalizing on the unique Web-wide features and services, the AltaVista network provides a distinct Internet experience through multiple integrated platforms, as in the following:

1. ***AltaVista search.*** The world's fastest, most comprehensive search service available in 25 languages with 8 distinct search dimensions.
2. ***AltaVista shopping.com.*** The first Web-wide comparison shopping service on the Internet, providing objective price and product comparison features to help users make intelligent purchasing decisions.
3. ***AltaVista live!*** The only real-time, customizable content source on the Web, linking content channels on topics such as money, news, sports, entertainment, and more.
4. ***AltaVista raging bull.*** The Web's stickiest site, which has the Web's most active community of message boards, with an emphasis on finance.
5. ***AltaVista free access.*** One of the fastest growing ISP services in the world, with over 2 million registered users in the US and Canada.
6. ***AltaVista international.*** Currently over half of its traffic comes from outside the US. To further encourage this growth, AltaVista has recently created local sites in France, Germany, Italy, the Netherlands, Sweden, and the UK.

in a wide range of usage packs, SatyamOnline today enables thousands of subscribers to benefit from the power of the Internet.

Their consumer portal *www.sify.com* aims to enhance the quality of users' lives by making them more efficient, connected, and aware of the world around them. The portal has many pioneering initiatives with regard to shopping, managing one's financial portfolio and brand promotions, in addition to mail, messaging, and search[20].

At Sify, their objective is to be a one-stop, e-solutions shop with a range of innovative and cost-effective IT solutions, products, and services. That is why they have formed alliances with leaders in e-commerce, Internet commerce, and network solutions. And they are strategically poised to give their clientele the best there is[21].

Sify's customer care processes are ISO 9002 certified—the first and only national Internet Service Provider to have such a certification.

So, at Sify, you'll find Customer Care Centres across the country, providing anytime, anywhere support. These 24-hour Centres have dedicated teams of trained customer care executives who address and diagnose all queries and problems related to SatyamOnline Internet access, swiftly and accurately.

They have taken customer care to a never before level, with support being available online at *customercare.sify.com*. This unique assistance system truly reiterates Sify's commitment to you.[22]

In their pursuit towards making organizations and the economy Internet driven, they are allied with those providing IT solutions, sales partners of our Internet-based products and services, Web-based solution providers including website designers and developers, Web hosting service providers, and online content providers.

Case Discussion

1. How does sify fit into the advertising model?
2. What are the other models that sify will fit in?
3. Study doubleclick.com, and see how a professional advertising model looks like.

Subscription Model

Users are charged a periodic—daily, monthly, or annual—fee to subscribe to a service. It is not uncommon for sites to combine free content with "premium" (i.e. subscriber or member-only) content. Subscription fees are incurred irrespective of actual usage rates. Subscription and advertising models are frequently combined.

Content Services provide text, audio, or video content to users who subscribe for a fee to gain access to the service. Example: *Netflix.com*

[20] www.sifycorp.com
http://sifyhosting.com
[21] www.sifycorp.com/partners/partners.asp
[22] www.sifycorp.com/custcare.asp

Person-to-Person Networking Services are conduits for the distribution of user-submitted information, such as individuals searching for former schoolmates. Example: *Classmates.com*

Trust Services come in the form of membership associations that abide by an explicit code of conduct, and in which members pay a subscription fee. Example: *Truste.com*

Internet Services Providers offer network connectivity and related services on a monthly subscription. Example: *America Online.*

The organization makes money on the basis of membership/subscription.

Some popular topics of Subscription model are

- Existing newsletter topics
- Trade associations

eGurucool.com

NIIT's vast experience in the field of education and eGurucool's expertise and in-depth understanding of the curricula have come together to make this a good site for e-education. Students are assured of a holistic learning experience that ensures a rewarding performance in school and board examinations, apart from the building up of a strong conceptual foundation for later life.

The salient features and benefits of the eGurucool way of learning are:

- Well structured lesson plans that generate interest, curiosity, and provide clarity about the objectives that should be achieved through the lessons. This ensures that students are drawn towards the lesson and derive maximum benefit from it.
- The lesson is not overloading, and is administered step-by-step. It is built around sub-topics that highlight principles. At all times, each lesson is not just textual. It incorporates the attributes of a very good teacher who asks, stimulates, prods, cajoles, and inspires.
- Technology is used wherever necessary—not to dazzle or distract but to provide greater insight through interactivity—without distrupting the flow of the lesson.

Courses Offered

An array of courses from eGurucool for students and teachers, course help and test preparation modules plus value-added services that enhance the quality of education.

- CBSE Programs
- ICSE Programs
- Maharashtra Board Programs
- IIT JEE Programs

eConnect

This is a service that empowers schools by connecting students, teachers and parents 24 hours a day and 7 days a week! It includes creation and maintenance of school

websites, online classnotes and assignments, and performance tracking. Through eConnect, eGurucool has tie-ups with over 1600 schools across the country and is here to change the way schools look at education.

Course Structure

The program is designed to cover the entire syllabus prescribed for a class:

- The theory and concepts of each chapter are covered in detail in the class. Illustrative examples are used to reinforce concepts.
- Regular assignments and tests with 'ideal' solutions.
- Mid-course assessment is done through a set of section tests.
- A set of full length tests that closely simulate the board pattern. A minimum of 7 tests.
- In addition to lectures, students also get printed booklets as study material.

E-services

This is a Web-based service that connects students, teachers and parents round-the-clock, 7 days a week. It allows students to access classnotes and assignments prepared by teachers and track their academic performance. Besides, eConnect provides an online marking tool for multiple choice questions.

Within an year of its launch, the eConnect network has spread in schools across India.

Here is a quick glimpse at what all eConnect offers:

1. ***eAssignments.*** Homework gets exciting. eAssignments give students access to their assignments wherever they are.

2. ***eClassnotes.*** Notes are just a click away. eClassnotes provide value-based synopsis and insight into the forthcoming topics.

3. ***Online MCQ test.*** Allows students to take MCQ tests online and gauge their performance instantly.

4. ***Performance tracker.*** This allows students and their parents to access their performance graphs.

5. ***Online quizzes.*** Subject and chapter-specific quizzes are available for all students from Class IX to Class XII.

eAssignments

eAssignments allow teachers to put up their assignments for the class on the Web. So students can access it anytime ... wherever there is a computer. This makes learning exciting, and helps students learn beyond the confines of their classrooms.

In short, eAssignments are an extension of value added information that teachers

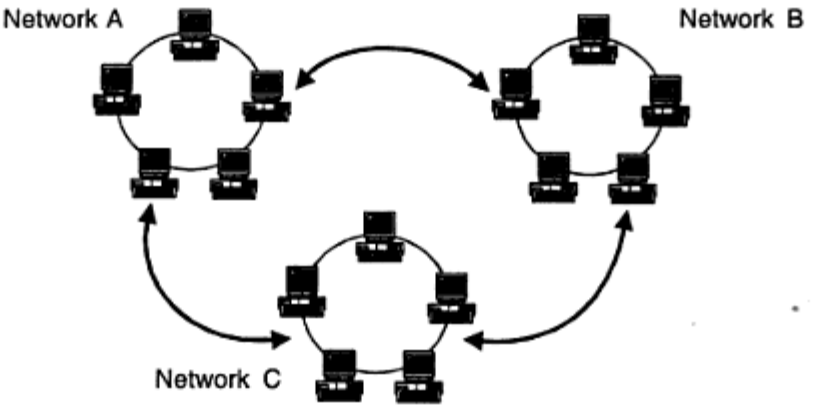

Fig. 3.1 Relationship between networks and Internets.

Communication Switching

Through the use of communication switching, computer networks allow computers to transfer data using shared lines of communication such as a cable. Communication switching works similar to telephone switching networks. A telephone switching network eliminates the need to connect a wire between your telephone and every telephone you may ever call. Instead, the phone company connects your phone (and everyone else's phone) to a set of switches. When you place a phone call, the switches create the connection between the two phones. Without a telephone switching network, if you needed to call 1000 different people, you would need to connect 1000 lines to your phone. In a similar way, computer networks rely on communication switches. Networks use two common methods of communication switching to transfer data—circuit switching and packet switching. In circuit switching, the switches create a single, unbroken path between devices that want to communicate.

Most computer networks, including the Internet, do not use circuit switching. They use a technique called **packet switching**. In a typical terminal-to-host data connection, the line remains idle for most of the time. Thus, with data connections, a circuit-switched approach is inefficient. In a circuit-switched network, the connection provides for transmission at a constant data rate. Thus, each of the two devices that are connected must transmit and receive at the same data rate as the other. This limits the utility of the network in interconnecting host computers and terminals.

In packet switching, data are transmitted in short packets. A typical upper limit on packet length is 1 kilobyte. If a source has a longer message to send, the message is broken up into a series of packets. Each packet contains a portion (or all for a short message) of the user's data, plus some control information. The control information, at a minimum, includes the information that the network requires in order to be able to route the packet through the network and deliver it to the intended destination. At each node on the route, the packet is received, stored briefly, and passed on to the next node. In packet switching, programs break data into small pieces, called *packets*, and then transmit the packets between computers. Packets are pieces of data that adhere to a standard set of rules (protocols) that

define their size and format. Unlike circuit switching, in a packet-switched network, data can flow along multiple paths, as shown in Figure 3.2.

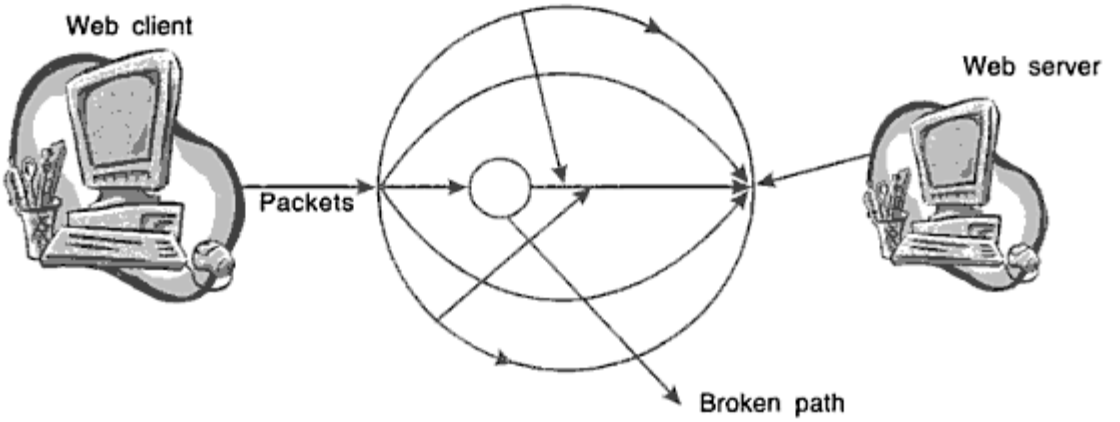

Fig. 3.2 A packet switching network with a broken path.

In packet-switched networks, breaking one path does not prevent the data from reaching its destination. The packet will simply find a different path. Each packet must contain its destination address. As the packet travels from one computer to another, each computer examines the packet's address and routes the packet to its next intermediate hop or directly to the destination. The Internet is a packet-switched network. Think of a packet in a packet-switched network as a traveller flying from New Delhi to Mumbai. Depending on the available flights, the traveller may be able to fly non-stop (if the packet is lucky enough to get a direct connection). In most cases, however, the traveller must stop at airports along the way (possibly in Ahmedabad or Jaipur). In a similar way, a packet may visit several computers as it travels across the Internet. As signals travel through network media (cables and wires), they become weak. Engineers refer to this weakening of signals as attenuation. To overcome this, the network designers use special networking devices called *repeaters* which amplify network data.

Developments in Transmission

Today, the Internet is measured by the capacity of its cables to carry information bits to users; this carrying capacity is called *bandwidth*. Universities and corporations typically connect directly to the Internet with dedicated leased lines of either 1,544,000 or 45,000,000 bits per second (bps). Each of these lines must support hundreds or even thousands of simultaneous users. In contrast, most home users dial into Internet through the telephone network, at *narrowband* rates. The modems on their computers are connected to a "twisted pair" of copper phone wires that can transmit at the rate of 14,000 to 56,000 bps. At such speeds, the text scrolls quickly down the screen, but a large image can take several minutes to appear.

The Internet can also be accessed at *midband* speeds of 128,000 bps or more. At midband speeds, still images open on the screen quickly, and it becomes possible to transmit moving pictures too, though still fuzzier and jerky.

Two of the midband technologies—Asymmetrical Digital Subscriber Line (ADSL) and Integrated Services Digital Network (ISDN)—use wires to connect users to the Internet through a telephone system. Another competing technology brings the Internet to home PCs, using the coaxial cables of cable television. Currently, cable television systems waste most of their bandwidth transmitting up to 75 television channels simultaneously in analog, whether a user wants them or not. Using digital switching, however, coaxial cables can carry perhaps 27,000,000 bps of Internet data alongside the regular cable programming. Unlike phone signals, which are sent to specific homes, cable signals are shared by entire neighbourhoods. Under normal conditions, each cable modem in a neighbourhood can get the equivalent of a midband connection. Broadband data will be processed by an infrastructure that uses Asynchronous Transfer Mode (ATM) to transmit data at 622,000,000 bps or more, and a technique called Quality of Service (QoS) that guarantees the smooth delivery of audio or video for a fee.

Network Routers

Network designers use routers to transfer or route data between networks that use different network technologies. Since the Internet is comprised of various networks that use many different network technologies, routers are an integral part of the Internet. A router has an address on the network. Using the addressing capability of routers, the nodes on a network can send packets destined for another network to a router. The router, in turn, will transfer the packet to the other network. To manage network traffic, network designers also use routers to segment large sections of a Local Area Network (LAN) to smaller segments, called *subnets*. To route data, routers commonly use routing tables, which are similar to a lookup database. Using a routing table, routers can look up the correct path (or the best route) from the packet's current location to any destination on the network. Depending on the network's requirements, a designer can implement routing tables as static or dynamic. With a static routing table, the network administrator must manually update the table. Network software automatically updates the dynamic routing tables. The advantage of dynamic routing tables is that, should a part of the network get bogged down with a lot of traffic, the network software can update the routing tables to route packets around the current bottleneck.

Connectionless versus Connection-oriented Protocols

Connectionless protocols differ from connection-oriented protocols in the way requests and responses to requests are handled. With a connectionless protocol, clients connect to the server, make a request, get a response, and then disconnect. With a connection-oriented protocol, clients connect to the server, make a request, get a response, and then maintain the connection to service future requests.

Encapsulation

Encapsulation is the packaging of attributes and functionality to create an object, essentially the one whose internal structure remains private, though accessible by other objects through a clearly defined interface. Encapsulation ensures security (see Figure 3.7).

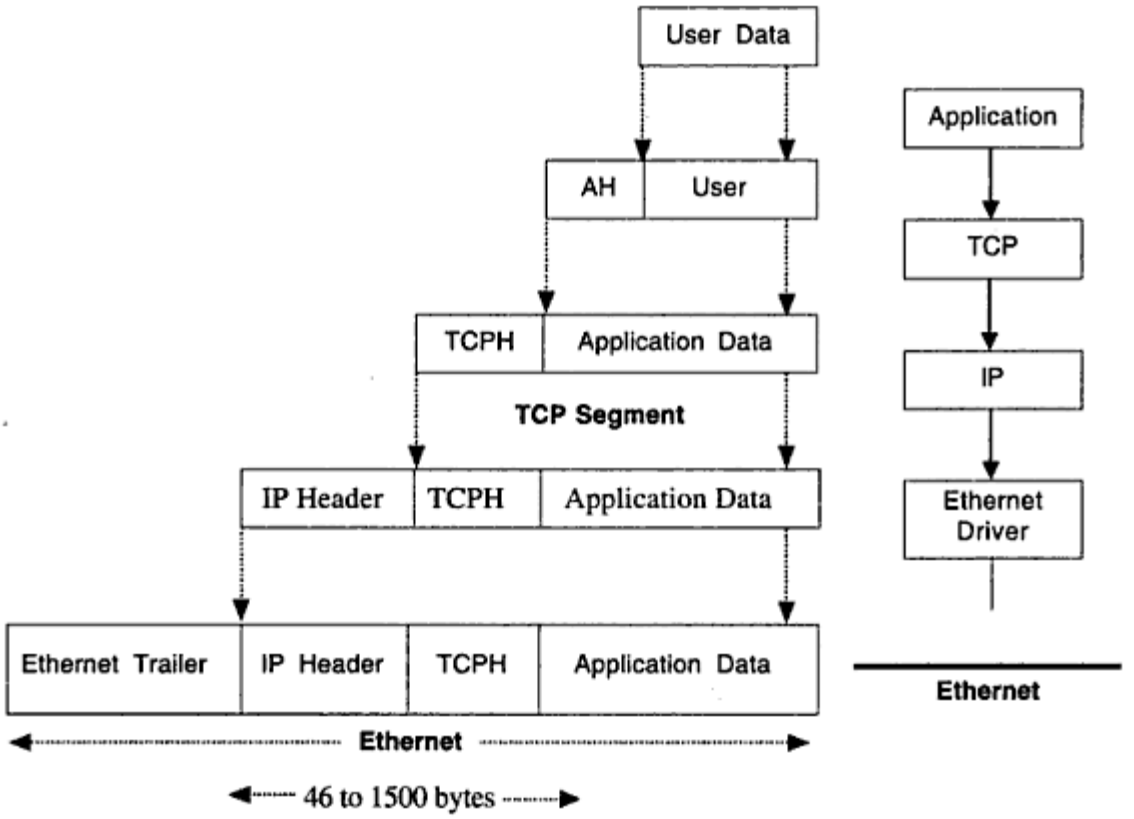

Fig. 3.7 Encapsulation.

AH in the given figure stands for Application Header and TCPH stands for TCP Header. The unit of data that TCP sends to IP is called a TCP segment. The unit of data that IP sends to the network interface is called an IP datagram. The stream of bits that flows across the Ethernet is called a *frame*.

Protocol Interfaces

Each layer in the TCP/IP protocol suite interacts with its immediate adjacent layers. At the source, the process layer makes use of the services of the host-to-host layer and provides data down to that layer. A similar relationship exists at the interface of the host-to-host and Internet layers and at the interface of the network access layers. At the destination, each layer delivers data up to the next higher layer. This use of each individual layer is not required by the architecture (see Figure 3.8).

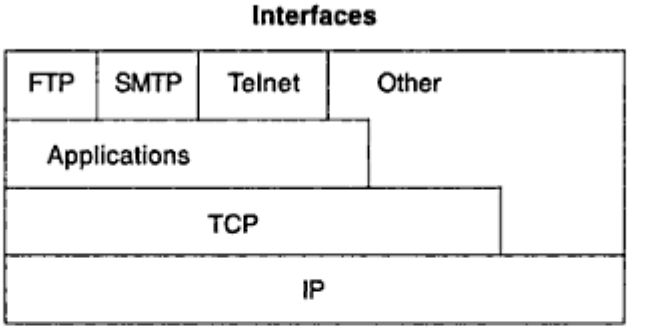

Fig. 3.8 TCP/IP protocol suite.

As the figure suggests, it is possible to develop applications that directly invoke the services of any one of the layers. Most applications require a reliable end-to-end protocol and thus make use of TCP. Some special-purpose applications, such as the simple network management protocol (SNMP), use an alternative host-to-host protocol known as the user datagram protocol (UDP); others may make use of IP directly. Applications that do not involve internetworking and that do not need TCP, have been developed to invoke the network access layer directly.

Search Engines

The Internet today contains billions of websites, which is analogous to a library having billions of books. This list of websites is getting longer every second. In such a situation, if one has to search for a particular topic, it becomes almost impossible to find it, as one is aware of possibly a few hundred sites. It is at this point that the search engines come to our rescue; or rather they help us in finding the proverbial needle in this immense haystack (or a tiny fly in the web). We may use two basic approaches. The first one is by a search engine and the second, by a subject guide such as Yahoo, Snap, Looksmart, and Magellan. Subject guides are for browsing general topics. For specific information, one should use a search engine.

History of the Search Engines

The first of all search engines was Archie, created in 1990 by Alan Emtage, a student at McGill University in Montreal. The author originally wanted to call the program "archives", but had to shorten it to comply with the Unix world standard of assigning programs and files short, cryptic names.

In 1990, there was no World Wide Web. Nonetheless, there was still an Internet, and many files were scattered all over the vast network. The primary method of storing and retrieving files was via the FTP. This was (and still is) a system that specified a common way for computers to exchange files over the Internet. Initially, anyone who wanted to share a file had to set up an FTP server in order to make the file available to others. Later, anonymous FTP sites became repositories for files, allowing all users to post and retrieve them.

Even with archive sites, many important files were still scattered on small FTP servers. Unfortunately, these files could be located only by the Internet equivalent of word of mouth, i.e. somebody would post an e-mail to a message list or a discussion forum announcing the availability of a file.

Archie changed all that. It combined a script-based data gatherer, which fetched site listings of anonymous FTP files, with a regular expression matcher for retrieving file names matching a user query. In other words, Archie's gatherer scoured FTP sites across the Internet and indexed all the files it found. Its regular expression matcher provided users with access to its database.

How Do the Search Engines Work

All search engines have what are called 'robots' or 'spiders', which spend their time going from link to link across the Internet. When they find a new site or an updated site, they will copy some information about the site back to their home database. It is this database, which is interrogated when you run a search. People can register their Web pages with search engines, which means that they usually get listed much more quickly than waiting for the spiders to come across them. They may have the ability to search by some or all of the following search methods:

- Keyword searching
- Concept-based searching
- Refining the search
- Relevancy ranking
- Meta tags

Keyword Searching

This is the most common form of text search on the Web. Most search engines do their text query and retrieval using keywords. Essentially, this means that the search engine pull out the pages containing the words it finds matching the query, and are significant. Words that are mentioned on the top of a document and words that are repeated several times throughout the document are more likely to be deemed important.

Concept-based Searching

Unlike keyword search systems, the concept-based search systems try to determine what you mean, not just what you say. In the best circumstances, a concept-based search returns hits on documents that are about the subject/theme you are exploring, even if the words in the document do not precisely match the words you enter into the query.

Excite is currently the best-known general-purpose search engine site on the Web that relies on concept-based searching. This is also known as clustering—which essentially means that words are examined in relation to other words found nearby.

For example, the word 'heart', when used in the medical/health context, is likely to appear with such words as coronary, artery, lung, stroke, cholesterol, pump, blood, attack, and arteriosclerosis. If the word 'heart' appears in a document with other words such as

continue to experience henceforth. Information agents perform the role of managing, manipulating or collating information from many distributed sources.

Interface or collaborative agents started out quite distinct, but with the explosion of the WWW and their applicability to this vast WAN, there is now a significant degree of overlapping. This is inevitable, especially since information or Internet agents are defined using different criteria. They are defined by what 'they do', in contrast to collaborative or interface agents which are defined by what 'they are'. Many of the interface agents built at the MIT Media Labs, for example, are autonomous and learned, but they have been employed in WWW-based roles; hence, they are in a sense, information agents.

Similarly, it is also true that we are drowning in data, being at the same time, starved of information. The underlying hypothesis of information agents is that, somehow they can ameliorate, but certainly not eliminate, this specific problem of information overload and the general issue of information management in this information era.

The motivation for developing information/Internet agents is at least twofold. First, there is simply a yearning need/demand for tools to manage such information explosion. Everyone on the WWW would benefit from them in just the same way as they benefit from search engines such as Google, Spiders, Lycos, or Webcrawlers.

Second, there are vast financial benefits to be gained. Recall that Netscape Corporation grew from relative obscurity to a billion dollar company almost overnight—and a Netscape or Internet Explorer client generally offers browsing capabilities, albeit with a few add-ons.

Information agents have varying characteristics: they may be static or mobile; they may be non-cooperative or social; and they may or may not learn. Hence, there is no standard mode to their operation. Internet agents could be mobile, i.e. they may be able to traverse the WWW, gather information and report what they retrieve to a home location. However, this is not the norm as yet. Information agents may be associated with some particular indexer(s), e.g. a Spider. A Spider is an indexer, able to search in depth, the WWW, and store the topology of the WWW in a database management system (DBMS) and the full index of URLs in the WAIS. Other search/indexing engines or spiders such as Lycos or Webcrawler can be used similarly to build up the index. Indeed, there are currently more than twenty spiders on the WWW.

The user information agent, which has been requested to collate information on some subject, issues various search requests to one or several URL search engines to meet the request. Some of this search may even be done locally if it has a local cache. The information is collated and sent back to the user.

Reactive Software Agents

Reactive agents represent a special category of agents which do not possess internal, symbolic models of their environments; instead they act/respond in a stimulus-response manner to the present state of the environment in which they are embedded. However, the most important points to be noted about the reactive agents are not these (i.e. languages, theories or architectures), but the fact that the agents are relatively simple and they interact with other agents in basic ways. Nevertheless, complex patterns of behaviour emerge from these interactions when the ensemble of agents is viewed globally.

Traditional Artificial Intelligence (AI) has staked most of its bets on the latter, which holds that the necessary and sufficient condition for a physical system to demonstrate intelligent action is that it is a physical symbol system. On the contrary, the physical grounding hypothesis challenges this long-held view, arguing that it is flawed fundamentally, and that it imposes severe limitations on symbolic AI-based systems. This new hypothesis states that in order to build a system that is intelligent, it is necessary to have representations grounded in the physical world.

The key benefit which motivates the reactive agents is the hope that they would be more robust and fault tolerant than other agent-based systems, e.g. an agent may be lost but without any catastrophic effects. Other benefits include flexibility and adaptability, in contrast to the inflexibility, slow response times and brittleness of classical AI systems. Another benefit, it is hoped, is that this type of work would address the frame problem which has so far proved intractable with traditional AI techniques such as non-monotonic reasoning.

Other challenges include the following:

1. Expanding the range and number of applications based on reactive agents
2. Yearning need for a clearer methodology to facilitate the development of reactive software agent applications. This may or may not require the development of more associated theories, architectures and languages. Much of the current approaches are on the basis of trial and error
3. Issues such as scalability and performance need to be addressed, though these are unlikely to be important until clearer methodologies are developed and evaluated.

Hybrid Agents

So far, we have reviewed five types of agents: collaborative, interface, mobile, Internet and reactive agents. The debates as to which of them is better are rather academic, and frankly, sterile, rather too early to get into. Since each type has (or promises) its own strengths and deficiencies, the trick (as always) is to maximize the strengths and minimize the deficiencies of the most relevant technique for your particular purpose. Frequently, one way of doing this is to adopt a hybrid approach which brings together the strengths of both the deliberative and reactive paradigms. Hence, hybrid agents refer to those whose constitution is a combination of two or more agent philosophies within a singular agent. These philosophies include a mobile philosophy, an interface agent philosophy and collaborative agent philosophy.

Hybrid agent architectures are still relatively few in number but the cause for having them is overwhelming. There are usually three typical criticisms of hybrid architectures in general. Firstly, hybridism usually translates to ad hoc or unprincipled designs with all its related problems. Secondly, many hybrid architectures tend to be very application-specific. Thirdly, the theory which undermines the hybrid systems is not usually specified. Therefore, we see the challenges for hybrid agents research quite similar to those identified for reactive agents. In addition to these, we would also expect to see the hybrids of philosophies other than those of reactive/deliberative ones. For example, there is scope for more hybrids within a singular agent: combining the interface agent and mobile agent philosophies, which would enable mobile agents to be able to harness features of typical interface agents; or some other combination.

Heterogeneous Agent Systems

Heterogeneous agent systems, unlike hybrid systems described in the preceding section, refer to an integrated set-up of at least two or more agents which belong to two or more different agent classes. A heterogeneous agent system may also contain one or more hybrid agents.

The essential argument is that the world abounds with a rich diversity of software products, providing a wide range of services for a similarly wide range of domains. Though these programs work in isolation, there is an increasing demand to have them interoperate—hopefully, in such a manner that they provide added value as an ensemble than they do individually. The hypothesis is that this is plausible. Indeed, a new domain called agent-based software engineering has been invented in order to facilitate the interoperation of miscellaneous software agents. A key requirement for interoperation amongst heterogeneous agents is having an Agent Communication Language (ACL) through which the different software agents can communicate with each other. The potential benefits for having the heterogeneous agent technology are as follows:

1. Standalone applications can be made to provide value-added services in order to participate and interoperate in cooperative heterogeneous set-ups.
2. The software legacy problem may be ameliorated since it could obviate the need for costly software rewrites, as they are given new leases of life by their interoperation with other systems. At the very least, the heterogeneous agent technology may lessen the blow or effect of routine software maintenance, upgrades or rewrites.
3. Agent-based software engineering provides a radical new approach to software design, implementation and maintenance in general, and software interoperability in particular. Its ramifications (e.g. moving from passive modules in traditional software engineering to proactive agent-controlled ones) would only be clear as this methodology and its tools become clearer.

Smart Agents

Smart agents are those agents which can learn, cooperate, and are autonomous. In a way, all agents are smart. But for our understanding, when these three qualities are combined in an agent, we call it smart.

Software Agents at Work

Auction watchers, comparison shoppers, personal web spiders, newshounds, site recommenders, and portfolio assistants are some of the agents operating in today's e-commerce world. It does not stop with these. The pace at which existing and experimental agent technologies are being applied to the virtual world has quickened. This is evident from the papers presented in conferences[3] on software agents. A good place to monitor new applications of software

[3] http://agents.media.mit-edu/publications/

Internet Service Provider (ISP)

The US Government's 1991 decision to end subsidizing the NSFNET backbone beginning in 1995, sparked a massive restructuring aimed at shaping the Internet into a faster and a more productive tool for the business. The InterNIC compilation of public access dial-up providers listed 80 vendors in December 1993. A year later, the list cited more than 1500 providers. Figure 3.12 illustrates how the providers work.

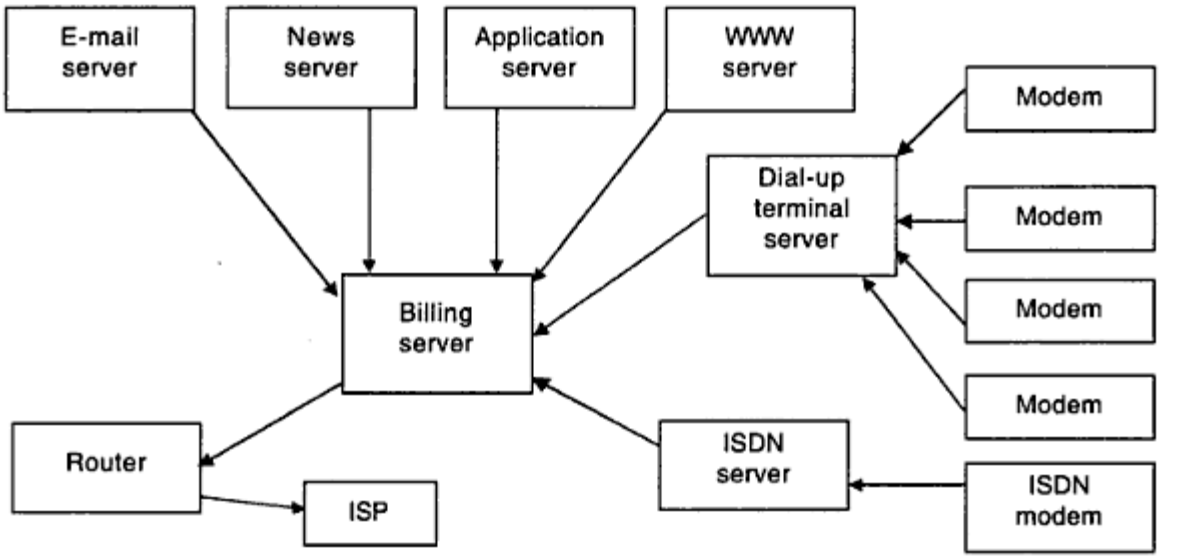

Fig. 3.12 Architecture of public access providers.

Commercialization of the Internet has taken place in two spheres: commercialization of users and commercialization of ISPs. At first, companies that accessed the Internet through the existing non-profit mid-level networks were offered a lower level of membership than the academic members. As restrictions were dismantled, commercial use of the Internet became more common. As soon as the commercialization was announced, ISPs came into existence to provide paid access to the various Internet applications and resources for both companies and individuals. Established telecommunications, cable and commercial online companies began to offer this service. Soon, others followed.

From a physical standpoint, the Internet is a network of thousands of interconnected networks. Included among the interconnected networks are:

1. The interconnected backbones that have international reach
2. A multitude of access/delivery sub-networks
3. Thousands of private and institutional networks connecting various organizational servers and containing much of the information of interest. The backbones are run by Network Service Providers (NSPs). The delivery subnetworks are provided by the local and regional ISPs (see Figure 3.13). The ISPs exchange data with the NSPs at the Network Access Points (NAPs).

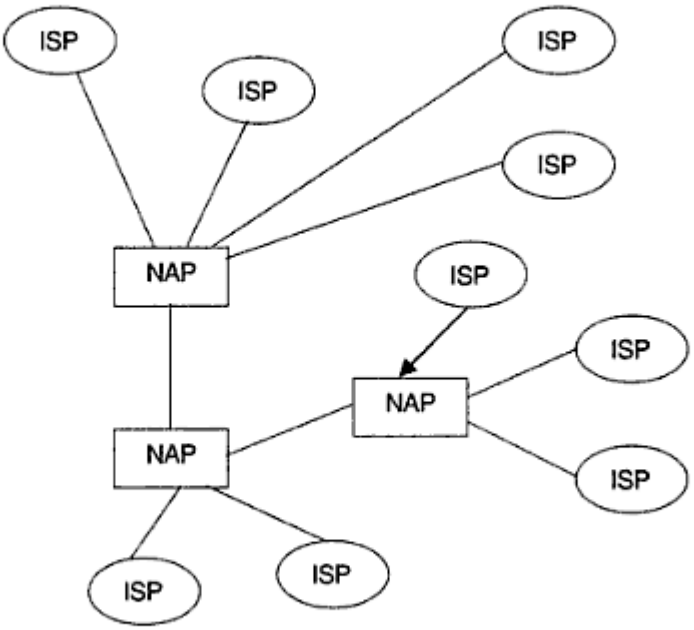

Fig. 3.13 NAPs and ISPs.

When a user issues a request on the Internet from a computer, the request traverses an ISP network, moves over one or more of the backbones and across another ISP network, to the computer containing the information of interest. The response to the request follows a similar path. For any given request and associated response, there is no preset route. In fact, the request and response are each broken into packets, and the packets can follow different paths. The paths traversed by the packets are determined by special computers called *routers*. The routers have updateable maps of the networks on the Internet, that enable them to determine the paths for the packets.

ISPs in India

Internet access, in a sense, came into India in the early 1990s. ERNet, a division of Department of Electronics (DoE), and NICNet (Department of Statistics) made the initial inroads in this field. Both ERNet and NICNet are government projects, but with very different charters and growth histories.

The ERNet (Educational and Research Network) project was designed to provide Internet connectivity to the premier educational and research institutions of India, while NICNet was assigned the provision of Internet services primarily to government departments and organizations.

NICNet was designed to provide V-SAT and dial-up Internet access primarily to government departments. It began with shell-only access, at 2400 bps, but now provides high speed TCP/IP access through 64 kbps V-SAT links.

ERNet and NICNet are thus India's first ISPs, though their operations have been shackled by the restrictions imposed on them by the government in the form of regulations and policies of the DoT. Despite this, they were doing quite well in providing essential Internet services to an Internet-starved India, until the advent of VSNL Internet services and the restrictive clampdown that followed.

Another provider of Internet services that preceded Videsh Sanchar Nigam Limited (VSNL) is the Software Technology Parks of India (STPI) Internet service. Again, this service was permitted only to a restricted audience, essentially the software exporters who fall under the STP scheme of the DoE. STPI has been providing high-end Internet services through leased lines and dial-up links, in and around several parts of the country, through the respective SoftNET networks.

On August 15, 1995, VSNL launched the **Gateway Internet Access Service**, for providing public Internet access. Starting with only dial-up shell and PPP access in the 4 metros, VSNL followed with leased-line access to subscribers, followed by the setting up of points of presence (POP) in Bangalore and Pune. VSNL has, since the inception of GIAS, portrayed itself in the press as India's only legitimate ISP, while forcing many restrictions on the other ISPs through DoT regulations and the telecom policy.

There is no bar on the number of companies which will be given licences and licence fees is virtually non-existent—none for the first five years and a mere Rs 10 for the next 10 years. The equity for foreign investment has been kept at 49 per cent as is the norm with other telecom services opened to the private sector.

The interested companies are free to fix their tariff and there is no insistence on coverage. E-mail companies have been allowed to automatically become Internet Service Providers (ISPs). However, pending a more defined policy, 'conditional licences' will be given to companies which have defaulted on licence fees in other services such as cellular, radio paging and basic phone services.

The present policy is not very different from the previous one prepared by a committee headed by Dr. Bimal Jalan and announced by a previous government. The policy based on Dr. Jalan Committee recommendations was announced on January 15, 1998.

Three categories of ISPs have been specified. In the category A, licences are given on an all-India basis, under the second category fall the 20 territorial circles and the four metro telephone systems of Delhi, Mumbai, Chennai and Calcutta as well as Bangalore, Hyderabad, Ahmedabad and Pune. Any secondary switching area (equivalent to a district) form a separate category C service area with the exception of the eight cities defined in B category. The security deposit has been fixed at Rs 2 crores, Rs 20 lakhs and Rs 3 lakhs (Note: 1 lakh = 100,000, 1 crore = 100 lakhs) respectively.

Private companies have been allowed to establish their own gateways in addition to using the gateways of DoT, VSNL or authorised public/government organisations. But this concept is only in principle because the Government has set up an inter-ministerial committee which will first go into security-related issues before granting permission to ISPs to set up alternate international gateways. Till then subscribers to ISPs will have to grapple with the problem of congestion facing existing Internet subscribers unless the VSNL dramatically increases the number of access nodes.

In addition to leasing transmission links from the DoT, ISPs are also allowed to utilise the infrastructure planned to be set up by the railways, State Electricity Boards, Power Grid Corporation etc. A point of discord might arise over the lease charges with the DoT likely to insist that these organisations should charge the same amount as DoT. The railways is planning two optical fibre-based networks between Chennai and Mumbai and Delhi and Mumbai with branches at a number of places.

There are in all 183 operating Internet Service Providers in India. Of them 41* ISPs (listed below) have all-status. The remaining are particular state-pacific.

ISPs having All-India Licence Include

BSNL	CMC	RPG Infotech	Essel Shyam Communications
Sify	Siti Cable Network	Gateway Systems (India)	World Phone Internet Services
VSNL	Guj Info Petro	Hughes Escorts Communications	Astro India Networks
Reliance	Primus Telecommunications India	ERNET India	RailTel Corporation
Data Infosys	GTL	Jumpp India	L&T Finance
HCL Infinet	Primenet Global	Tata Internet Services	Tata Power Broadband
Bharti Infotel	Pacific Internet India	In2Cable (India)	Reliance Engineering Associates
BG Broad India	Swiftmail Communications	Estel Communication	Bharti Aquanet
Trak Online Net India	Spectra Net	Reach Network India	i2i Enterprise
Tata Teleservices (Maharashtra)	Comsat Max	Gujarat Narmada Valley Fertilizers Corporation	HCL Comnet Systems and Services

Terms Related to ISPs

There are some terms exclusive for ISPs. Let us discuss them now.

Shell Access

Internet access supporting only textual interfaces, with Unix or Unix-like operating system commands. This requires "logging in" to a Unix-type user account, and then operating via textual commands or text-based menu systems. Shell access does not use the TCP/IP network protocols between the user (client) end and the servers. Therefore, applications like Netscape, NFS file sharing, and Internet telephony cannot be used.

Dial-up Modem

As opposed to leased-line modems, this device is connected between a computer or a Data Terminal Equipment (DTE) and a conventional POTS analog telephone line. This is used to dial in to a corresponding modem at the service provider, and connect to the Internet or other services (e.g. INET X.25 network).

Serial Line Internet Protocol (SLIP)

SLIP is one of the popular protocols for IP access over dial-up and analog leased lines. Now commonly superseded by Point-to-Point Protocol (PPP), it is still used by some ISPs. SLIP and PPP are two similar methods of encapsulating TCP packets to go over a modem line. PPP is simpler to set up, as compared to SLIP, and can handle more types of traffic. These two enable the PCs to become part of the Internet.

Very Small Aperture Terminal (V-SAT)

V-SAT is a satellite-based digital communication system usually consisting of 1.8 metre diameter satellite dishes establishing point-to-point connections, often via a V-SAT hub, a central switching system. Bandwidths can be from 2400 bps to 256 kbps. Communication delay is high, due to the two satellite hops between end points, and hub latency.

ISP Policy of the Government of India

Given the rapid growth of Internet across the world and in India (about 0.25 million accounts), the government came out with an Internet policy to promote the same. The key features are:

- Any company incorporated in India is eligible to set up an ISP.
- The foreign equity holding should be limited to 49 per cent.
- Licence period would be for 15 years.
- There is no licence fee for the first five years and Re 1 per annum for subsequent years.
- There will be different licences for different areas. For this purpose, the entire country has been divided into three categories.

  Category 'A'—the whole of India.
  Category 'B'—comprises 20 telecom circles in cities like Delhi, Mumbai, Kolkata, Chennai, Ahmedabad, Bangalore, Hyderabad, and Pune.
  Category 'C'—covers the secondary-switching areas of DoT.

- A company can get any number of licences.
- There shall be no limit on number of licences that can be granted to a company in a particular area.
- International connectivity would be through gateways of DoT, VSNL or authorized public/government organizations. Private ISPs will be allowed to provide gateways

8. Try to log on to Sahara airline's site. What will happen if you type airsahara.com?
9. Why is IPv6 needed?
10. Find out who have implemented IPv6.
11. What is an intelligent agent?
12. List two characteristics of agent technology that will be useful for the marketplace.
13. Give the history of hypertext and hypermedia.
14. Why is google.com a big success? How do they make profit? What is special about google's search engine?
15. What is the difference between HTML and XML?

CHAPTER 4

E-marketing

Nearly 1 billion people around the world are expected to tap into the Internet, by 2005. With the Internet growing at an astonishing pace in recent years, marketers around the world are racing to take advantage of its interactive nature, to communicate and foster exchanges and relationships with customers, suppliers, and the public. Also, the amount of transactions on the Internet are increasing exponentially, as shown in Table 4.1.

TABLE 4.1
TOTAL WORLDWIDE E-COMMERCE REVENUES, 2004 (B2B & B2C)[1]

Region	*Total*
North America	$3.5 trillion
Asia Pacific	$1.6 trillion
Western Europe	$1.5 trillion
Latin America	$81.8 billion
Rest of World	$68.6 billion

The shopping patterns among the countries can be seen in Table 4.2.

TABLE 4.2
ONLINE SHOPPING PATTERNS IN TERMS OF INTERNET PENETRATION[2]

Category	*Country average*	*Lowest*	*Highest*
Internet users	27%	6% (Indonesia)	58% (USA)
Online shoppers	10%	1% (Thailand/Turkey)	27% (USA)
Online dropouts	15%	1% (India)	32% (Korea)
Offline shoppers (but browse online)	13%	1% (Portugal)	36% (Hong Kong)
Future online shoppers	14%	3% (Poland)	31% (Italy)

[1] www.epaynews.com
[2] www.epaynews.com

The accelerating confluence of traditional print and broadcast media with new digital media like the Internet has created dynamic new channels for marketers. At the same time, advertisers have begun demanding greater economic efficiency in reaching target customers. The Internet is changing the design and implementation of marketing strategies. This dynamic technology provides marketers with efficient and powerful methods of designing, promoting, and distributing products, conducting research, and gathering market information.

E-marketing can include any Internet-based promotion, including websites, targeted e-mail, Internet bulletin boards, sites where customers can dial-in and download files, and so on. The term does not have a strict meaning though, and many marketing managers use it to describe any computer-based marketing tool.

Traditional Marketing

If marketing is whatever you do to promote the sale of your products or services, then it should include:

1. Market research—from competitive information-gathering to industry awareness to soliciting customer opinions and preferences
2. Publicity from press releases to the positioning of your company and its offerings in the marketplace
3. Advertising that is text-based (classifieds) and graphic-based (display)
4. Sales, including distribution and merchandising
5. Customer service and customer support.

Traditional marketing seems to fall far short of three features. There are certain problems associated with it, which can be listed as follows:

1. Traditional marketing is often expensive. It can cost a lot of money to produce and print brochures, product sheets, and catalogues. It is also expensive to keep support personnel on hand to answer inquiries from customers, and it costs a lot of money in postage and shipping fees to send information to prospective customers.
2. Traditional marketing can be a very time-consuming process. Mistakes have to be corrected; you have to go back to the ad agency or printer to revise, add or delete, and you often have to wait for months for an ad that you have placed to appear in a publication.
3. Traditional marketing often has a "hit and miss" quality. Marketers often send out bulk of mails to customers and yet receive a tiny response. Moreover they feel that they do not cater to the taste of the consumers or rather that they do not come across the right consumer.

Businesses have always made their presence felt by establishing shops, factories, warehouses, and office buildings. An organization's presence is the public image it presents to its stakeholders. The stakeholders of a firm include its customers, suppliers, employees, stockholders, neighbours, and the general public. Companies tend not to worry much about the image they project until they make their mark. Initially, they focus only on their survival.

On the Web, making one's presence felt is much more important. The only contact that customers and other stakeholders have with a firm on the Web might be its website or its Web pages. Therefore, creating an effective and appealing Web page is essential even for the smallest and the newest firm operating on the Web.

Identifying Web Presence Goals

When a business creates a physical space in which to conduct its activities, its managers focus on very specific objectives. Few of these objectives are image-driven. An ambitious businessman must find a location that will be convenient for customers to access, with sufficient floor space features to allow the selling activity to occur, and they must take into consideration, the room space to store inventory and provide working space for employees. An added feature is the interior decoration which could enhance the business ambience, and at the same time attract customers. The success of a business relies on fulfilling these objectives in a tangible, physical location.

On the Web, businesses and other organizations have the advantage of creating a space of their own choice, design and other embellishments, good enough to make a distinctive presence. A website can have images, and can activate them by animation, thus making the customers feel and enjoy its presence. It can serve as a sales brochure, a product showroom, a financial report, an employment ad, or a customer contact point. Each entity that establishes a Web presence should decide which tasks the website must accomplish, and which tasks are most important and need to be included for promoting their business.

Different firms, even those in similar business, may establish different Web presence goals. For example, Coca-Cola and Pepsi are two companies that have established very strong brand images and are in the same business, but have developed very different Web presences.

In Figure 4.1, you can see the website of Pepsi.

Now, have a look at their competitor's site, given in Figure 4.2. These two companies change their Web pages frequently.

The Coca-Cola page usually includes its corporate image such as the Coke bottle, while the Pepsi page is usually filled with hyperlinks to a variety of activities and product-related information.

These Web presences project the image of each of these companies. Each presence is consistent with other elements of the marketing efforts of these companies. Coca-Cola is maintaining its long-drawn traditional position, and Pepsi, as the upstart product favoured by the younger generation.

Achieving Web Presence Goals

An effective site is the one that creates an attractive presence that meets the objectives of the business or the organization. These objectives include:

1. Attracting visitors to the website
2. Making the site interesting enough so that visitors stay and explore

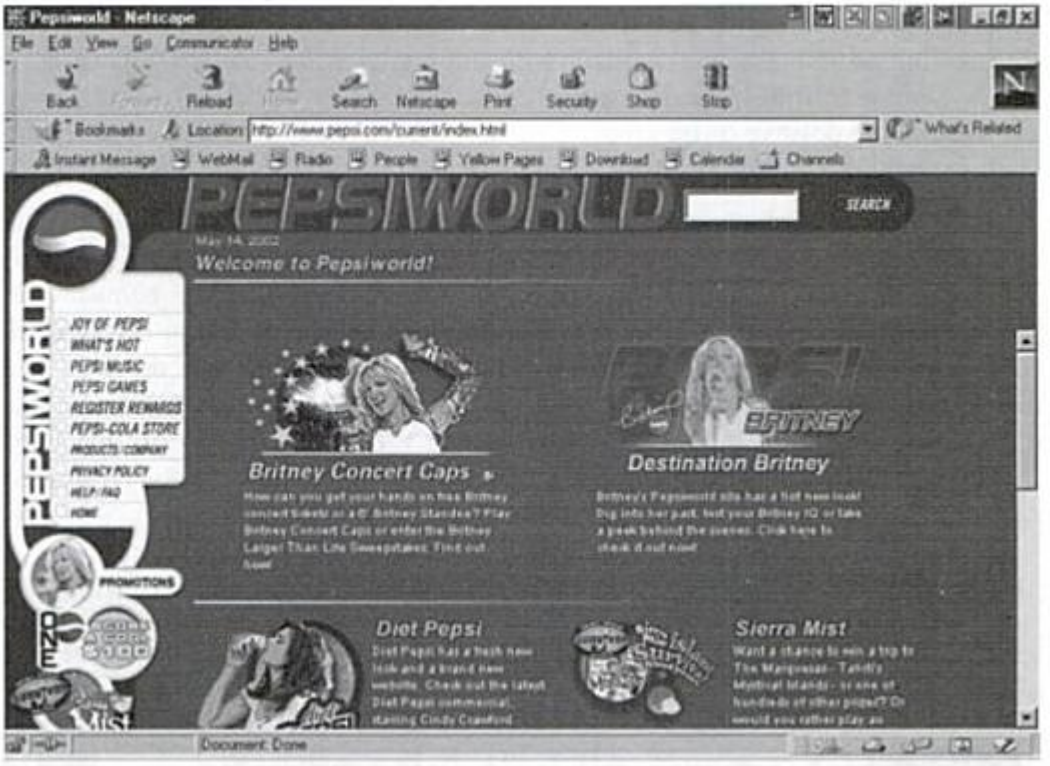

Fig. 4.1 The Pepsi website.

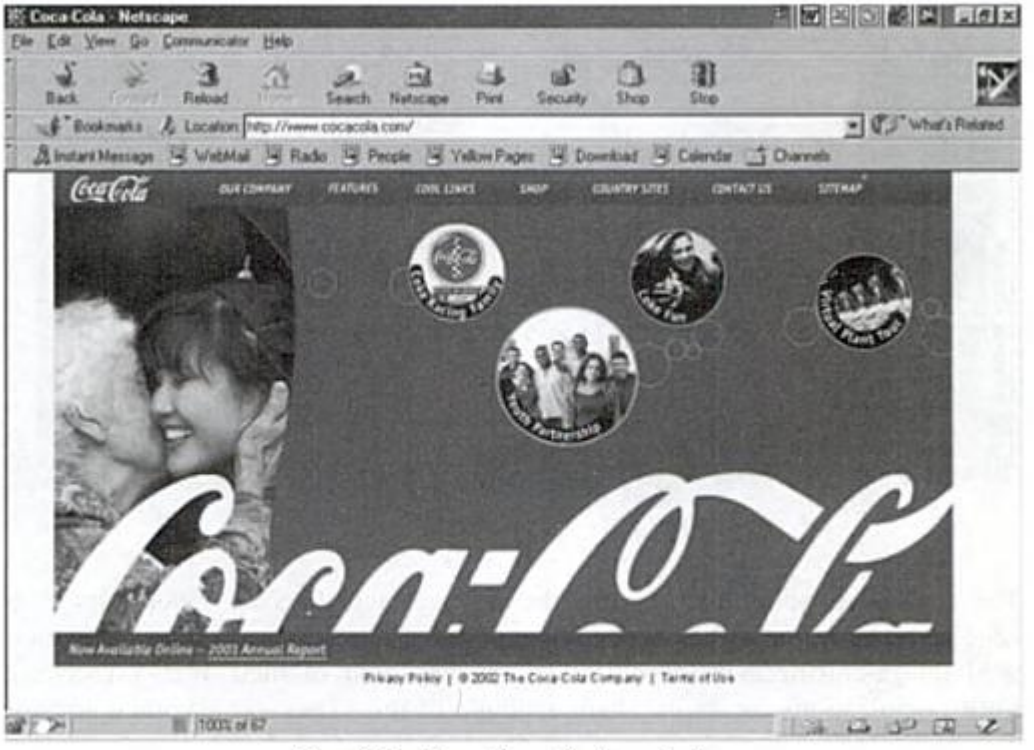

Fig. 4.2 The Coca-Cola website.

3. Convincing visitors to follow the site's links to obtain information
4. Creating an impression consistent with the organization's desired image
5. Building a trusting relationship with visitors
6. Reinforcing positive images that the visitor might already have about the organization
7. Encouraging visitors to return to the site.

The Toyota website given in Figure 4.3 is a good example of an effective Web presence. The site provides a product showroom feature, links to detailed information about each product line, links to dealers, and links to information about the company and the ancillary services it offers, such as financing and insurance. The page also offers a help link and contact information. A good example of how Toyota has created a presence with this page that is consistent with its corporate philosophy is the statement that appears on the page: "...we've built a website that illustrates why Toyota's Cars and Trucks are ideal for your life...." The website lives up to this and it is a proof of the indelible corporate presence that Toyota wants to establish through the Internet to all potential customers.

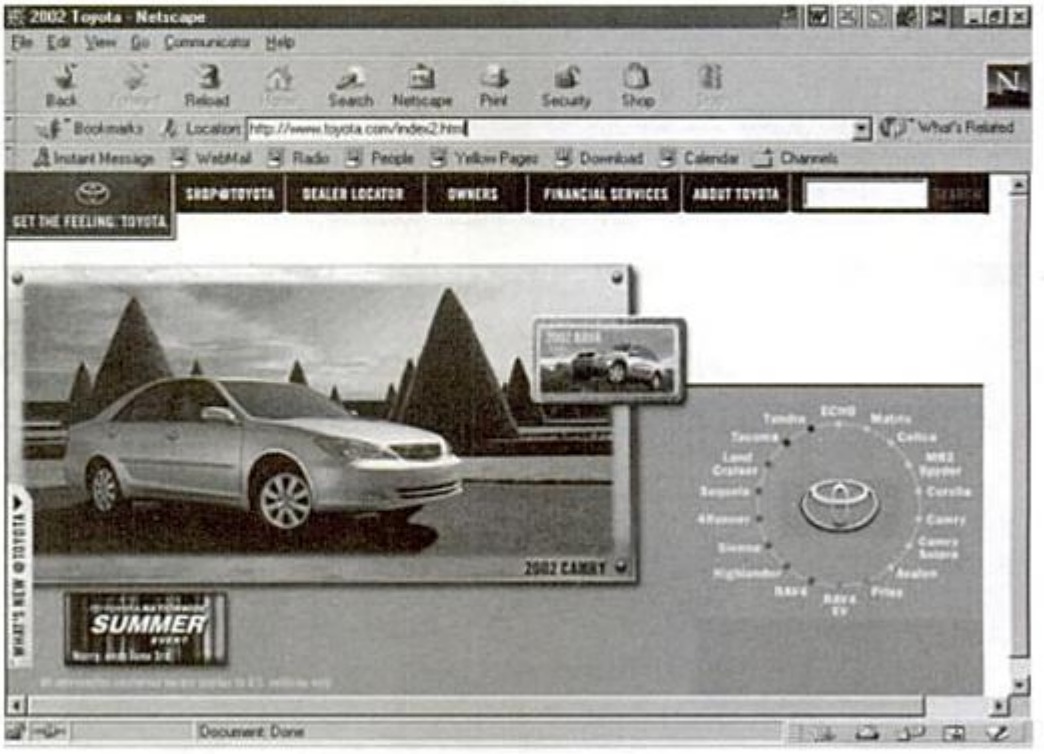

Fig. 4.3 The Toyota website.

The Toyota example illustrates that the Web can integrate the opportunity to enhance the image of a business with the provision of information. For some organizations, this integrated image-enhancement capability is the key goal of their Web presence efforts. Non-profit organizations are an excellent example of this. They can use their websites as a central resource for integrated communications with their varied and often geographically-dispersed constituencies.

TABLE 4.10
DATA MINING APPLICATIONS

Industry	*Applications*
Retailing and sales distribution	Predicting sales, determining inventory levels and schedules.
Banking	Forecasting levels of bad loans and fraudulent credit card use, predicting credit card spending by new customers, predicting customer response to offers.
Airlines	Capturing data on where customers are flying and the ultimate destination of passengers who change carriers in mid-flight; thus, airlines can identify popular locations that they do not service and check the feasibility of adding routes to capture lost business.
Broadcasting	Predicting what is best to air during prime time and how to maximize returns by interjecting advertisements.
Marketing	Classifying customer demographics that can be used to predict which customers will respond to a mailing or buy a particular product.

Intelligent Agents in Marketing and Customer-related Applications

As the number of customers, products, vendors, and information increases, it becomes uneconomical, or even impossible, to match customers and products and consider all relevant information. The practical solution to handle the information overload is to use intelligent and software agents.

Agents are used to support many tasks. One of the primary reasons for using such agents is to overcome the tremendous amount of information overload. When going through the purchasing decision process described earlier, for example, a customer must examine large numbers of alternatives, each of which is surrounded by considerable amounts of information.

A search engine is a computer program that can automatically contact other network resources on the Internet, search for specific information or keywords, and report the results. This type of request is repetitive, and answering such requests is costly when done by a human. Search engines deliver answers economically and efficiently by matching questions with FAQ templates, which include standard questions and "canned' answers to them.

Unlike search engines, an intelligent agent can do more than just "search and E-match." For example, it can monitor movement on a website to check whether a customer seems lost or ventures into areas that may not fit his or her profile, and the agent can notify the customer and provide assistance. Depending on their level of intelligence, agents can do

many other things, some of which are demonstrated here. Of the many agent applications, we cover only several representative ones. See Figure 4.8.

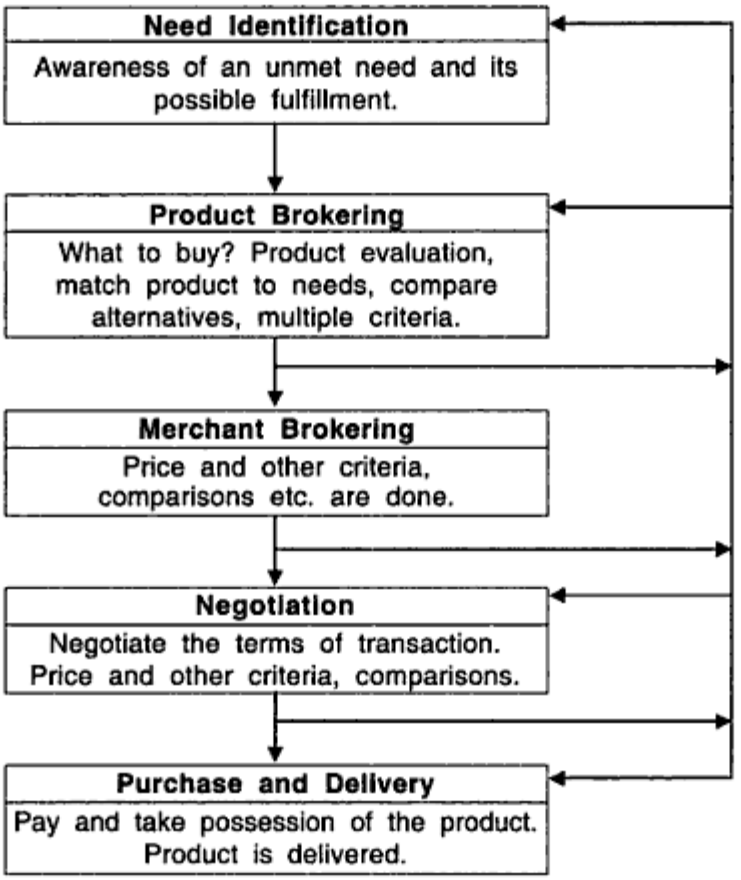

Fig. 4.8 Agent-purchasing.

Need Identification

Agents can assist the buyer with need identification by providing product information and stimuli. For example, *amazon.com* provides its customers with an agent that continuously monitors sets of data (such as the arrival of new books) and notifies customers when a book in their area of interest arrives. Similar agents watch for stocks to go below or above a certain level, sending the customer an e-mail when that level is reached. *Expedia.com* notifies customers about low airfares to a customer's desired destination whenever they become available.

Product Brokering

Once a need is established, customers search for a product (or service) that will satisfy this need. Several agents are available to assist customers with this task.

The pioneering agent in this category was firefly. This agent, which was purchased by Microsoft and is no longer available independently, initially helped users find music they were likely to enjoy. Firefly (and similar agents) use a collaborative filtering process to build profiles of people who visit a website. Firefly provided users with a tool that identified them when they visited sites participating in the Firefly program and recommended products/ services to them. Based on people's likes (favourite movies, music, interests), Firefly helped marketers predict what customers were likely to want next. This allowed marketers to reach out to consumers with a customized pitch, that was cheaper and more effective than mass advertising. It made product recommendations based on the prioritization of attributes, such as price and delivery time, by users.

Merchant Brokering

Once a customer knows what product he or she wants, the customer needs to find *where* to buy it. Bargain Finder (from Andersen Consulting) was the pioneering agent in this category. The agent, used in online CD shopping, queried the price of a specific CD from a number of online vendors and returned a list of prices. However, this system has encountered problems because vendors who do not want to compete on price only have managed to block out the agent's requests.

Negotiation

The concept of "market" implies negotiation, mostly about prices. In B2B transactions, negotiation is very common. The benefit of dynamically negotiating a price is that the decision is shifted from the seller to the marketplace. In a fixed-price situation, if the seller fixes a price that is too high, sales will suffer. If the price is set too low, profits will be lower. Electronic support of negotiation can be extremely useful.

Kasbah also uses intelligent agents in the negotiation process. Kasbah agents (*kasbah.com*) can negotiate with each other following specific strategies assigned by their creators. However, this agent's usefulness is limited by the fact that price is the only parameter considered.

Agents can negotiate in pairs, or one agent can negotiate for a buyer with several sellers' agents. In such a case, the contact is done with each seller's agent individually, but the buyers agent can conduct comparisons.

Purchase and Delivery

Agents are used extensively during the actual purchase, including arranging payment and delivery with the customer. For example, if a customer makes a mistake when completing an electronic order form, an agent will point it out immediately. When customers buy stocks, for example, the agent will tell the customers when a stock they want to buy on margin is not marginable, or when the customer does not have sufficient funds. Delivery options at *amazon.com*, for example, are posted by agents and the total cost is calculated in real-time.

a chance to win a prize, or even a direct cash payment. For example, *AllAdvantage.com* is a company that pays web users for permission to monitor their web surfing activities. After tracking these users, *AllAdvantage.com* presents targetted ads to them. Advertisers are willing to pay a premium to have access to persons who have demonstrated by their Web surfing habits, that they are interested in the products or services offered by the advertisers.

Brand-leveraging Strategies

Rational branding is not the only way to build brands on the Web. One method that is working for well-established websites is to extend their dominant positions to other products and services. Yahoo! is an excellent example of this strategy. Yahoo! was one of the first directories on the Web. It added a search engine function early in its development and has continued to parlay its leading position by acquiring other Web businesses and expanding its existing offerings. Then, Yahoo! acquired *GeoCities* and *Broadcast.com*, and entered into an extensive cross-promotion partnership with a number of Fox entertainment and media companies. Yahoo! continues to lead its two nearest competitors, Excite and Infoseek, in ad revenue by adding features that Web users find useful and that increase the site's value to advertisers. *Amazon.com's* expansion from its original book business into CDs, videos, and auctions is another example of a website leveraging its dominant position by adding features useful to existing customers.

Affiliate-marketing Strategies

Of course, this leveraging approach only works for firms that already have websites that dominate a particular market. As the Web matures, it will be increasingly difficult for new entrants to identify unserved market segments and attain dominance. A tool that many new, low-budget websites are using to generate revenue is affiliate marketing. In affiliate marketing, one firm's (the affiliate firm's) website includes descriptions, reviews, ratings, or other information about a product that is linked to another firm's site that offers the item for sale. For every visitor who follows a link from the affiliate's site to the seller's site, the affiliate site receives a commission. The affiliate site also obtains the benefit of the selling site's brand in exchange for the referral.

One of the more interesting marketing tactics made possible by the Web is cause marketing, which is an affiliate-marketing program that benefits a charitable organization (and thus, supports a "cause"). In cause marketing, the affiliate site is created to benefit the charitable organization. When visitors click a link on the affiliate's Web page, a donation is made by a sponsoring company. The page that loads after the visitor clicks the donation link carries advertising for the sponsoring companies. Many companies have found that the click-through rates on these ads are much higher than the typical banner ad click-through rates. A leading retail Web florist, *proflowers.com*, has had excellent results advertising on *The Hunger Site* page. When a visitor clicks the button on this page, a group of sponsoring

advertisers donates food to a hungry person and a page appears in the visitor's browser with ads for the sponsors.

Viral-marketing Strategies

Traditional marketing strategies have always been developed with an assumption that the company was going to communicate with potential customers directly or through an intermediary that was acting on behalf of the company, such as a distributor, retailer, or independent sales organization. Since the Web expands the types of communication channels available, including customer-to-customer communication, another marketing approach has become popular on the Web. Viral marketing relies on existing customers to tell other persons—the company's prospective customers—about the products or services they have enjoyed using. Much as affiliate marketing uses websites to spread the word about a company, viral marketing approaches individual customers to do the same thing. The number of customers increases much as a virus multiplies, thus the name.

Website Naming Issues

Firms that have a major investment in branding a product or a service must protect that investment. In Chapter 5, you learned about the security issues surrounding website naming. The legal and marketing aspects of website naming can be very much complicated. Although a variety of state and federal laws protect trademarks, the procedure for creating and using website names that are not trademarks can present some challenging issues. Obtaining identifiable names to use for branded products on the Web can be just as important as ensuring legal trademark protection for an existing brand investment.

In 1998, a poster art and framing company named Artuframe opened for business on the Web. With quality products and an appealing site design, the company was doing well, but it was concerned about its URL, which was *www.artuframe.com*. After searching for a more appropriate URL, the company's president found the website of Advanced Rotocraft Technology, an aerospace firm, at the URL *www.art.com*. After finding out that Advanced Rotocraft Technology's site was drawing 150,000 visitors each month who were looking for something art-related, Artuframe offered to buy the URL. The aerospace firm agreed to sell the URL to Artuframe for $450,000. Artuframe immediately changed its URL to *Art.com* and experienced a 30 per cent increase in site traffic, the day after implementing the name change. The newly named site however, did not rely on the name change alone. It has since then entered a joint marketing agreement with Yahoo! that places an ad for *Art.com* on art-related search result pages. *Art.com* has also created an affiliate program with businesses that sell art-related products and other organizations that have websites devoted to art-related topics.

Another company that invested in an appropriate URL was *Cars.com*. The firm paid $100,000 to the speculator who had originally purchased the rights for the URL. *Cars.com* is a themed-portal site that displays ads for new cars, used cars, financing, leasing, and other

car-related products and services. The major investors in this firm are newspaper publishers that wanted to retain an interest in automobile-related advertising as it moved online. Classified automobile ads are an important revenue source for many newspapers.

Table 4.13 lists domain names that have been sold for more than $1 million each.

TABLE 4.13
DOMAIN NAMES THAT WERE SOLD

Domain name	*Price*
Business.com	$7.5 million
Altavista.com	$3.3 million
Loans.com	$3.0 million
Wine.com	$3.0 million
Autos.com	$2.2 million
Express.com	$2.0 million
WallStreet.com	$1.0 million

Although most domains that have high value are dot-com sites, the name *engineering.org* sold at an auction to the American Society of Mechanical Engineers, a not-for-profit organization, for just under $200,000.

Several legitimate online businesses, known as URL brokers, are in the business of selling or auctioning domain names that they believe others will find valuable. Companies selling "good" (short and easily remembered) domain names include *Domains.com*, *DomainRace.com*, *GreatDomains.com*, and *HitDomains.com*. *Unclaimed Domains* sells a subscription to lists of recently expired domain names that it publishes periodically, and the Netcraft website has a URL search function to search for words in URLs. The Internet Corporation for Assigned Names and Numbers (ICANN) maintains a list of accredited domain name registrars, which are companies that have been authorized by ICANN to sell the rights to use specific domain names ending in com, net, and org.

Advertising-supported Model

The advertising-supported business model is the one used by network television in the United States. Broadcasters provide free programming to the audience along with advertising messages. The advertising revenue is sufficient to support the operations of the network and the creation or purchase of the programs.

Many observers of the Web in its early growth period, believed that the potential for Internet advertising was tremendous. However, after a few years of experience trying to develop profitable advertising-supported business models, many of those observers are less optimistic. The success of Web advertising has been hampered by two major problems. First, as discussed earlier, no consensus has emerged on how to measure and charge for site visitor views. Since the Web allows multiple measurements, such as of number of visitors, number

is not a surprise that websites which specialize in providing only classified advertising, have profit potential if they can reach a narrow enough target market.

An implementation of the advertising-supported business model which appears to be successful is web employment advertising. Firms with websites such as *CareerSite.com* and *JOBTRAK* offer international distribution of employment ads. As the number of people using the Web increases, these businesses will be able to move out of their current focus on technology and higher-level jobs and include advertising for all kinds of positions. These sites can use the same approach that search engine sites use to offer advertisers target markets. When a visitor specifies an interest in, for example, engineering jobs in Dallas, the results page can include a targeted banner ad for which an advertiser will pay more, because it is directed at a specific segment of the audience. Employment ad sites can also target specific categories of job seekers by including short articles on topics of interest. This will also ensure that qualified people, who are not necessarily looking for a job, keep coming back to the site; such people are the candidates most highly sought after by employers.

Marketing Strategy on the Web

Finally, it needs to be reiterated that strategy for marketing on the Internet should follow rules such as those given in Table 4.14.

TABLE 4.14
MARKETING STRATEGIES FOR THE WEB

Strategy	*Rules*
Brands	Your website becomes your most important brand.
Change	Keep in mind that the marketing rules on the Internet are constantly changing.
Conciseness	Keep your pages short, and spread information on several pages.
Content	Content is the king and so make it interesting.
Dynamic sites	Create dynamic sites that use new technologies to adapt information based on user profiles.
Finances	Try new markets with low advertising pricing schemes.
Free giveaways	Create free offerings for your loyal customers.
Global village	Think global, but localize.
Live events	Online events create quick awareness.
Niche markets	The Internet is a series of niche markets and mass markets.
Promotion	Promote your site everywhere.
Syndication	Co-brand your services and products.
Technology	Use Internet technology to maximize your marketing objectives.

The Times of India

Till 2002, *The Times of India* was just another newspaper competing to make its mark and increase its readership. But today, the newspaper has transformed from what was once a plain-looking national newspaper into a global one, which anybody in any part of the world can access with just a click of the mouse.

To put consumers, i.e. the readers, in the center of the flagship media brand, The Times Group had hired a seasoned advertising strategy professional, Rahul Kansal, as Brand Director. The new position of Brand Director was to attempt to address the readers as consumers and a 'brand person' (and not just a content person—Editor) needs to constantly evolve the product offering. When the TOI decided to revamp its brand image, it brought about a lot of changes to its paper as well as its online edition. The Internet hence played a very important role in its remodeling. They changed their page layout, broke the page up into different sections, added pictures to break the monotony, and then went online.

Now, how did going online help them? It integrated the hard copy of the newspaper with the online edition. They made the website a place where people came for more than just news. They introduced the following online features:

- Classified advertisements: There is an option of online search. Since there is no restriction like in the print, more ads can be accommodated. This is also integrated with the printed version.
- Hot links: They provide links to the e-paper that makes the local paper globally available for a subscription, and other favourite links like Bollywood, NRI news, etc.
- News items: Links to the regular sections of the newspaper are also provided, like India, sports, world, weather, entertainment, etc.
- Opinion section: In this section, the views of the various columnists, editor and people on the various current affairs are given.
- Online copies of all supplements.
- Online shopping, games, chats, e-mails.
- Lots of pictures and graphics to make it interesting.
- They also have links to other sites powered by the Times Group, thereby promoting those as well.

Advantages of the Online Edition

- Accessibility—People from Bangalore to Boston, Hyderabad to Houston can all have access to TOI.
- Hourly updates—Any breaking news can be easily found on the website, and people need not wait for the next morning.
- Caters to a wide range of interests and needs—Current affairs, finances, shopping, entertainment, astrology, travel bookings, etc.
- Platform to voice opinions—Opinion polls, letters to the editors, views of columnists and editor.

- Show customers that they too are modern and on par with the changing trends.
- Incorporate features that keep bringing people back to their site—offering the customers more than just news.

All of this and more add up to the Brand—*The Times of India*.

Case Discussion

1. What are the advantages of having an internet version of the newspaper?
2. Visit the site of *The Times of India* and identify the difference between the internet version and the actual newspaper?
3. How does the marketing model fit into the internet version of the newspaper?

Rediff.com[10]

Founded in 1996, Rediff.com India Ltd., is one of India's leading Internet, communications and media companies, serving Indians globally, both online and offline. Through its online and offline product and service offerings, Rediff.com offers interest specific channels, local language editions, sophisticated search capabilities, online shopping, long distance calling cards and Internet based telephony services. Its news publication, India Abroad, is one of the oldest and largest South Asian weekly newspaper, serving the Indian American community in the United States. The Company also provides users extensive Internet community offerings, all tailored to the interests of Indians worldwide. Rediff.com has offices in New York, Chicago, New Delhi and is headquartered in Mumbai, India.[11]

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THIRD EDITION

E-Commerce

An Indian Perspective

P.T. Joseph, S.J.

Electronic Commerce is a rapid and exciting area of development, with new issues emerging everyday in this global and real-time activity. The comprehensive coverage of this **third edition** equips the students with the latest information in e-commerce—concepts, models, strategies, and techniques that can be used to build useful e-commerce applications.

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The book features several comprehensive and diverse case studies and data on Indian corporations, showing success and failure of their Web-based electronic business models. New material on developments in technology and general business strategy has been added in all chapters.

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- Provides coverage of all elements of e-commerce including customer relationship, supply chain management, e-payment, e-security, mobile commerce, and Web designing.
- Explains in detail the potential of mobile computing technologies, WAP, data warehousing and data mining techniques.
- Addresses key legal issues related to cyberstalking, privacy, copyright, and so forth.
- Gives the end-of-chapter Internet search exercises to help students develop analytical skills.
- Defines key technical terms in the glossary.

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