CHAPTER 1

INTRODUCTION

At the turn of the second millennium, we are poised at one of the most important changes in our lives — the move to an Internet-based society. Almost everything is changing — at home, in school, at work, in the government — even in our leisure activities. Some changes are already evident around the globe. Others are just beginning. A very significant change is in the manner we conduct business, especially how we manage the marketplace and commerce. This fact is signified the term “e-commerce.”

E-Commerce or Electronic Commerce describes the manner in which transactions take place over networks, mostly the Internet. The Internet is becoming a basic need today. It has changed the shopping experience of e-shoppers, as virtual stores score on convenience, variety and price. Brick and mortar retailers can no longer afford to ignore the potential of this medium. Online shopping has truly come of age and consumers are keen to shop on the net. In this retail business, one does not count footfalls. Nor do customers get the real world, touch-and-feel experience of the goods they buy. The shopping ambience, too, is only as good as the customer wants it to be. Still shoppers are flocking to these “virtual malls” in millions. Online shopping is no longer a fad; it is an acknowledged and important part of the retail experience, with more than a tenth of the world’s population having bought products and services over the Internet.

The number of internet users has more than doubled since the year 2000, and now in 2006, it is available to over one billion people worldwide.

In other words, e-commerce has unleashed yet another revolution, which is changing the way businesses buy and sell products and services. It has affected a significant portion of the world including business, professions, and of course on people. Its impact lies not just in the creation of web based corporations. It is building a new industrial order. Vice President Albert Gore Jr. put it thus:

_We are on the verge of a revolution that is just as profound as the change in the economy that came with the industrial revolution. Soon electronic networks will allow people to transcend the barriers of time and distance and take advantage of_
global markets and business opportunities not even imaginable today, opening up a new world of economic possibility and progress.

The aim of this research study is to describe what e-commerce is: how it is being conducted and managed, its major opportunities, limitations, issues and its implications for India. E-commerce is interdisciplinary, and therefore it should be of interest to managers and professional people in any functional area of the business world.\textsuperscript{7}

The study presumes that while e-commerce has a broader definition referring more to the macro-environment, e-business relates more to the micro-level of the firm. Although slightly different, both are highly integrated and reliant upon each other. Hence, both these words carry the same meaning in the study.
1.1 Defining E-Commerce

What’s my ROI on e-commerce? Are you crazy? This is Columbus in the New World. What was his ROI?

- Andy Grove, Chairman of Intel

Over the past two decades, businesses in virtually every sector of the world economy have benefited from the technologies of e-commerce. It is an emerging concept that describes the process of buying and selling or exchange of products, services, and information via computer networks including the Internet. In order to gain a better understanding of the subject, some definitions of e-commerce are discussed below:

Carol Cram defines e-commerce with reference to Commerce. He says “the term Commerce refers to all the activities in which a company or individual engages to complete a transaction. When you use the Internet to engage in some or all of these activities, commerce becomes e-commerce. Therefore, one can define e-commerce as using the Internet to assist in the trading of goods and services.” He has shown E-Commerce transactions and activities through Figures 1.1.1 and 1.1.2.

![Figure 1.1.1: Summary of an e-commerce transaction](image-url)

Paul Timmers\textsuperscript{11} states that e-commerce can be defined loosely as ‘doing business electronically. E-commerce, or better electronic business, includes electronic trading of physical goods and of intangibles such as information. It encompasses all the trading steps such as online marketing, ordering, payment, and support for delivery.

Turban\textsuperscript{12} states that e-commerce is the process of electronically buying and selling goods, services, and information. Certain EC applications, such as buying and selling stocks or books on the Internet, are growing at a rate of several hundred per cent every year.

Kamlesh Bajaj and Debjani Nag\textsuperscript{13} suggest e-commerce as electronic means of transferring information. They state that EC helps conduct traditional commerce through new ways of transferring and processing information, which is at the heart of any commercial activity. Information is transferred electronically from computer to computer. This has transformed the way organizations operate.

Kalakota and Whinston\textsuperscript{14} define EC from these perspectives:

- From a \textit{communications perspective}, EC is the delivery of information products/services or payments over telephone lines, computer networks or any other electronic means.
From a **business process perspective**, EC is the application of technology to the automation of business transactions and workflow.

From a **service perspective**, EC is a tool that addresses the desire of firms, consumers, and management to cut service costs while improving the quality of goods and increasing the speed of service delivery.

From an **online perspective**, EC provides the capability of buying and selling products and information on the Internet and other online services.

Peter Cunningham\(^1\) has emphasized that e-business has an impact on all business activities. He states that it is the execution by electronic means of interactive, inter-organizational processes. Here “electronic” is a combination of telecommunications and computing capabilities.

E-business forms an umbrella for a series of distinct electronic processes as shown in Figure 1.1.3 along the chain from supplier to consumer, most of which have physical analogues. These processes encompass the entire spectrum of human activity from commerce to finance, from education to entertainment and from government to religion.

**Figure 1.1.3: The Electronic Business Framework**

The UNCTAD 2000 Report of Electronic Commerce and Development presented different definitions of e-commerce put forward by different organizations. Here are some of them in a rough order of decreasing generality:

<table>
<thead>
<tr>
<th>Definition</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Electronic Commerce is the carrying out of business activities that lead to an exchange of value across telecommunication networks.&quot;</td>
<td>European Information Technology Observatory.</td>
</tr>
<tr>
<td>&quot;Electronic commerce refers generally to all forms of transactions relating to commercial activities, including both organizations and individuals that are based upon the processing and transmission of digitized data, including text, sound and visual images.&quot;</td>
<td>Measuring Electronic Commerce, OECD, 1997.</td>
</tr>
<tr>
<td>&quot;Electronic commerce is about doing business electronically. It is based on the electronic processing and transmission of data, including text, sound and video. It encompasses many diverse activities including electronic trading of goods and services, online delivery of digital content, electronic fund transfers, electronic share trading, electronic bills of lading, commercial auctions, collaborative design and engineering, online sourcing, public procurement, direct consumer marketing, and after-sales service. It involves both products...and services...; traditional activities...and new activities...”</td>
<td>European Commission.</td>
</tr>
</tbody>
</table>


Kamlesh Bajaj and Debjani Nag have also signified e-commerce as a means of paperless exchange of business information. They state that e-commerce refers to the paperless exchange of business information using electronics for Data Interchange, Mail, Bulletin Boards, Funds Transfer and other network-based activities. It not only automates manual processes and paper transactions, but also helps organizations move to a fully electronic environment and change the way they operate.

Peter Cunningham is of the view that e-commerce is an integration of business processes and IT. According to him, the boundaries of Electronic Business are expanding all the time. Business encompasses the execution of interactive, inter-business processes.
By combining information technology and business processes, e-business re-invents the way we work. It involves embedding IT into a business or other organizational process (Fig 1.1.4) to enable that process to operate. Its impact on both internal and external organization gives it the power to create new organizations.

Chesher\(^{19}\) points out to the impact of e-Business through practical everyday examples.

**Purchasing a Gift**

A woman enters a store and goes directly to the information desk, having previously looked through the store’s electronic catalogue on the Internet. Access to the Internet is made from home using her combined TV/personal computer. Her husband’s birthday is just two hours away and she has almost decided what to buy him. “Do you still have stock of the Bosch cordless drill on special offer, as advertised in your electronic catalogue?” She asks. The store assistant moves to the computer screen on the counter and enters an enquiry. Almost instantly he responds to the customer: “While we currently do not have any in stock, a shipment of Bosch cordless drills will be delivered this afternoon.” The same afternoon, her husband gets a nice gift from his wife.
Sending Minutes of a Meeting

Due to a delay in the arrival of the incoming aircraft, a businessman's flight is delayed by 45 minutes, which should give him just enough time to complete the minutes of a meeting earlier that day with a prospective new client. He removes the laptop computer from its case and proceeds to expand upon the notes he made during the meeting. Several follow-up items require immediate action. One of them concerns the need to establish exactly how much training is required for his prospective client to become proficient in the use of the new retail application, as well as including how much training is already a part of their standard contract. With the help of his mobile phone, which is connected to the laptop, he establishes a connection to the service used by his company for information exchange and e-mail. While this is used both internally and externally, providing customers with access to a wide range of product information, company sensitive data related to clients is restricted solely to internal employees. In searching the database of existing clients from his laptop computer connected to the service, he soon finds one with a similar set of circumstances to that of his prospect. He notes the E-mail address of the sales manager involved, attaches the minutes of his meeting, creates and sends a message requesting advice on the approach to be taken. Just before the flight is called he creates a distribution list for the minutes, noting that the recipients have a range of different types of E-mail addresses. The minutes are sent and as he finishes packing away the laptop and mobile phone, boarding commences. He can now relax on the journey home.
Small Business User
A Sunday driver has dropped into his local Auto Help shop for a stop-light bulb. It seems just like any other small store providing spare parts to local garages and DIY enthusiasts. There is a slight smell of oil in the air, tools on the shelves, together with racks of pre-packaged components, paints and car cleaning materials. On the counter, on top of the two cash tills are two screens, each with their own printer attached. Cables disappear into the counter to be connected to a computer no larger than a video recorder, on a shelf and protected by a wooden panel. Another cable follows a pillar on the counter into the roof only to terminate at another computer with screen and printer in a small office 10 meters away. “It’s a great system,” the shopkeeper explains. “It allows us to check stock availability, price each product and create a customer VAT receipt if required.” The capital investment was not very high when compared to the people costs in running the business, and the considerable benefits that the system had brought in, reduced ordering time, increased stock availability, eliminated paperwork and improved customer service.

These are the situations in daily life that give a view of Electronic Commerce, which is becoming a lifestyle of today’s business arena. Business functions are increasingly performed electronically, whether in placing an order with a supplier, sending a message to a colleague, accessing a data warehouse for product information, or passing business transactions directly from one computer application to another. This study, with its focus upon doing business electronically, is relevant to organizations both large and small.

Any organization, enterprise, government agency or individual can employ Electronic Business to improve their processes or create new ones. In some cases, in the not-too distant future, Electronic Business could become the only way of doing business.
1.2 **Driving forces of e-commerce**

To understand why EC is becoming so popular, it is worth examining today's business environment, the pressures it creates on organizations, the responses of the organizations, and the potential role of EC.²⁰

The relationship between business pressures, organizational responses, and EC is shown in Figure 1.2.1, which illustrates a model of the new world of business.

![Figure 1.2.1: Major Business Pressures and the Role of EC](image)


The business environment refers to the social, economic, legal, technological, and political actions that affect business activities. Turban has divided business pressures into the following categories:

- Market
- Societal
- Technological
These are summarized in Table 1.2.1

### Table 1.2.1 Major Business Pressures

<table>
<thead>
<tr>
<th>Category</th>
<th>Pressures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market and economic pressures</td>
<td>Strong competition</td>
</tr>
<tr>
<td></td>
<td>Global economy</td>
</tr>
<tr>
<td></td>
<td>Regional trade agreements (e.g. NAFTA)</td>
</tr>
<tr>
<td></td>
<td>Extremely low labour cost in some countries</td>
</tr>
<tr>
<td></td>
<td>Frequent and significant changes in markets</td>
</tr>
<tr>
<td></td>
<td>Increased power of consumers</td>
</tr>
<tr>
<td>Societal and environmental</td>
<td>Changing nature of workforce</td>
</tr>
<tr>
<td>pressures</td>
<td>Government deregulations</td>
</tr>
<tr>
<td></td>
<td>Shrinking governmental subsidies</td>
</tr>
<tr>
<td></td>
<td>Increased importance of ethical and legal issues</td>
</tr>
<tr>
<td></td>
<td>Increased social responsibility of organizations</td>
</tr>
<tr>
<td></td>
<td>Rapid political changes</td>
</tr>
<tr>
<td>Technological pressures</td>
<td>Rapid technological obsolescence</td>
</tr>
<tr>
<td></td>
<td>Increased innovations and new technologies</td>
</tr>
<tr>
<td></td>
<td>Information overload</td>
</tr>
<tr>
<td></td>
<td>Rapid decline in technology cost versus performance ratio</td>
</tr>
</tbody>
</table>


Market, economical, societal, and technological factors are creating a highly competitive business environment in which customers are the focal point. Furthermore, these factors can change quickly, sometimes in an unpredictable manner. Therefore, companies need to react frequently and quickly to both problems and opportunities resulting from this new business environment. Because the pace of change and the degree of uncertainty in tomorrow’s competitive environment are expected to accelerate, organizations will be operating under increasing pressures to produce more and faster, using fewer resources.

Boyett and Boyett (1995) emphasize this dramatic change and describe it with a set of business pressures or drivers. They maintain that in order to succeed (or even to survive) in this dynamic world, companies must take not only traditional actions such as lowering costs and closing unprofitable facilities but also engage in innovative activities such as customizing products, creating new products or providing superb customer service.

To emphasize on the impact of business pressures on organizations, Turban has used a classic management framework originally developed by Levitt, later modified by Scott-Morton and
further modified to reflect the role of IT in general and EC in particular. The framework is depicted in Figure 1.2.2

**Figure 1.2.2: Framework for organizational and societal impacts of information technology**


As per the above framework, organizations are composed of five major components, one of which is IT (including EC) – and they are surrounded by an environment that also includes EC. The five components are in a stable condition, called equilibrium, as long as no significant change occurs in the environment or in any of the components. However, as soon as a significant change occurs, the system becomes unstable, and then it is necessary to adjust some or all of the internal parts. As one can see in the figure above, the internal components are interrelated. For example, a significant change in an organization’s strategy may create a change in the corporate structure. Similarly, the introduction of EC, either in the environment (e.g. by a competitor) or the initiation of EC in the company itself, creates a change. Unstable organizations may be unable to excel or even survive. Therefore, organizations need to engage in critical response activities.
However, traditional response activities may not work in today’s environment, so many old solutions need to be modified, supplemented, or eliminated. Organizations can also take proactive measures to create a change in the marketplace. The major critical response activities are summarized in Figure 1.2.3

**Figure 1.2.3: Critical response activities**

![Critical response activities diagram]

Source: Turban et al. (1999)


The major responses of organizations are divided here into five categories: strategic systems for competitive advantage, continuous efforts, business process reengineering (BPR), business alliances, and EC. Several responses can be interrelated; they can be found in more than one category and e-commerce can also facilitate the other categories. For example, it supports BPR in following areas:
► Reducing cycle time and time to market
► Empowerment of employees and collaborative work
► Knowledge management
► Customer-focussed approach
► Business alliances.

Thus Turban\textsuperscript{25} concludes by saying that market (economics), technological, and societal pressures force organizations to respond. Traditional responses may not be sufficient due to the magnitude of pressures and the frequent changes involved. Therefore, organizations frequently must use innovations and reengineer their operations. In many cases, Electronic Commerce is the major facilitator of organizational responses.

While Turban emphasizes market, technological and societal pressures, Ravi Kalakota\textsuperscript{26} is of the view that interest in e-commerce is been fuelled by economic forces, customer-interaction forces, and technology-driven digital convergence.

\textbf{Economic forces}

Under relentless pressure to reduce costs and stay competitive, firms are attracted to the economic efficiencies offered by e-commerce. These economic efficiencies include low-cost technological infrastructures that reduce the cost burden of technology upgrades and obsolescence, low-cost and accurate electronic transactions with suppliers, the low cost of global information sharing and advertising, and the ability for firms to provide low-cost customer service alternatives to expensive retail bank branches and telephone call centres.

\textbf{Marketing and customer interaction forces}

The message for marketers is clear: the purchasing climate and the products change quickly. In order to be competitive, marketing executives must employ technology to develop low-cost customer-prospecting methods, establish close relationships with customers, and develop customer loyalty. Marketers must adapt to a business world in which traditional concepts of differentiation no longer hold; in this world “quality” has a new meaning, “content” may not be equated with “product”, and “distribution” many not automatically mean “physical location.”

In light of this, marketers in all industries are seeking new ways of interacting with customers and delivering services.
Electronic Commerce and the multimedia revolution are driving the previously disparate industries such as the communications, entertainment, publishing, and computing worlds into ever-closer contact, forcing industries with traditionally different histories and cultures to compete and cooperate.

These economic and marketing forces and digital convergence have influenced how industries are repositioning themselves to take advantage of new opportunities, including the creation of entirely new service products, and the development of new information-based products for the online environment.

Rana Tassabehji has highlighted a few key driving forces that allow a comparison of e-commerce between different countries. These key drivers are measured by a number of criteria that can highlight the stage of advancement of e-commerce in each of the respective countries. The criteria that can determine the level of advancement of e-commerce are summarized in table 1.2.2 and can be categorized as:

1. Technological factors — the degree of advancement of the telecommunication infrastructure which provides access to the new technology for business and consumers.
2. Political factors — including the role of government in creating legislation and initiatives to support the use and development of e-commerce and IT.
3. Social factors — incorporating the level and advancement in IT education and training which will enable both potential buyers and the workforce to understand and use a new technology.
4. Economic factors — including the general wealth and commercial health of the nation and the elements that contributed to it.
Table 1.2.2 Key drivers of e-commerce

<table>
<thead>
<tr>
<th>Key drivers</th>
<th>Measurement Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technological factors</td>
<td>• Telecommunication infrastructure</td>
</tr>
<tr>
<td></td>
<td>• Backbone infrastructure and architecture</td>
</tr>
<tr>
<td></td>
<td>• Industry players and competition</td>
</tr>
<tr>
<td></td>
<td>• Pricing</td>
</tr>
<tr>
<td></td>
<td>• Internet service Providers</td>
</tr>
<tr>
<td></td>
<td>• Range of services available (e.g., ADSL, ISDN)</td>
</tr>
<tr>
<td></td>
<td>• Ownership (private or public sector)</td>
</tr>
<tr>
<td></td>
<td>• Access to new technology developments</td>
</tr>
<tr>
<td></td>
<td>• Bandwidth</td>
</tr>
<tr>
<td></td>
<td>• Speed of development and implementation of technology by industry sector</td>
</tr>
<tr>
<td>Political factors</td>
<td>• Number and type of government incentives and programmers to support the use and development of electronic commerce</td>
</tr>
<tr>
<td></td>
<td>• Legislation - number and type of supportive or restrictive laws and policies that govern electronic data, contracts and financial transactions. For example, laws that recognize and enforce the validity of electronic documentation, contracts and transactions in a court of law; the validation of digital signatures; legal usage of electronic documents; and the legal recognition of electronic signatures in a court of law.</td>
</tr>
<tr>
<td></td>
<td>• Public policies - whether government supports the growth of electronic transactions and processes. For example, filling tax returns electronically; the national public policy and curriculum.</td>
</tr>
<tr>
<td>Social factors</td>
<td>• Skills of workforce</td>
</tr>
<tr>
<td></td>
<td>• Number of users on-line</td>
</tr>
<tr>
<td></td>
<td>• Penetration rate of PCs</td>
</tr>
<tr>
<td></td>
<td>• Level of education, computer literacy and IT skills</td>
</tr>
<tr>
<td></td>
<td>• Culture of technophilia - a willingness and ability to adopt new technology and the speed at which technology achieves critical mass (as in Japan)</td>
</tr>
<tr>
<td>Economic factors</td>
<td>• Economic growth - GDP</td>
</tr>
<tr>
<td></td>
<td>• Average income</td>
</tr>
<tr>
<td></td>
<td>• Cost of technology (hardware and software)</td>
</tr>
<tr>
<td></td>
<td>• Cost of access to telecommunication infrastructure - pricing structures and Rates</td>
</tr>
<tr>
<td></td>
<td>• Commercial infrastructure - advancement of banking sector; payment systems</td>
</tr>
<tr>
<td></td>
<td>• Innovative business models</td>
</tr>
</tbody>
</table>


While the above factors allow comparison between the different countries, there are a few factors that operate at the level of firms and affect the development of e-commerce in them:

- Organizational culture – attitude to research and development (R&D); willingness to innovate and use technology to achieve objectives.
- Commercial benefits – in terms of cost savings and improved efficiency that impact on financial performance and processes.
- Skilled and committed workforce – that is understanding, willing and able to implement new technologies and processes.
• Requirement of customers and suppliers – in terms of product and service demand and supply.

• Competition – ensuring the organization stays ahead of or at least keeps up with competitors and industry leaders.

Conclusion:

Thus, e-commerce provides the infrastructure and environment that enables and facilitates e-business. Within this, the implementation of e-business is solely dependent on whether there is a demand by the organization and whether it can be supplied within the organization. Demand is created largely by the need to cut costs, improve efficiency, maintain competitive advantage and meet stakeholder requirements. These business objectives can be met through the supply of a technological infrastructure to improve organizational processes, a willingness, ability and commitment to integrate new technology and improve work practices within the organization, and crucial to all this is the allocation of resources.

These are a few factors prevalent at the micro as well as macro levels of the firm that spell the development of e-commerce. These factors should be studied well and should be leveraged upon if one wants to excel in this digital economy.
1.3 A brief history

Understanding the history of the Internet is vital to understanding what is happening today on the Internet.28

The roots of the Internet lie in the fears of the Cold War.29 In the 1950s and early 1960s, there was a widespread concern in the United States about the possibility of a nuclear conflict with the erstwhile USSR. The spectacular successes of the Soviet space programme also contributed to the fears that the USA was losing its technological supremacy. These and other factors led to the formation of the Defense Advanced Research Projects Agency (DARPA) within the US Department of Defense with the objective of regaining this technological superiority.

During the 1960s the development of technology to achieve data transfer between computers took place along with the acceptance of the concept of “ARPANET”—the computer network for DARPA. The preliminary data exchange between computers in the ARPANET in 1969 did start a new era in communication technology, but it was still not possible for networks of differing architectural designs to communicate with one another as there was lack of common language or 'protocol'. Efforts for the development of such a protocol continued in the 70s, mostly under the leadership of Bob Kahn and Vint Cerf and finally the transmission Control Protocol/Internet Protocol (TCP/IP) developed by them emerged as the industry standard in 1983. Now for the first time different computer networks could communicate with one another and the 'Internet' (meaning inter-network communication) in the present sense became a possibility.

During the 1980s, widespread development of LANs, PCs and workstations fuelled its rise and researchers and developers were increasingly using it in communicating with one another. During that decade, the number of hosts (computers with registered IP addresses) rose from about 200 to over 300,000. In 1986, the National Science Foundation (NSF) of the USA launched its NSFNET to increase access to the Internet. This led to an explosion of connections mostly from universities. In 1990, ARPANET, the mother of the present Internet, was decommissioned, having achieved much more than what its planners could have ever asked for. NSFNET remained the backbone network of the Internet until 1995.
In spite of the spectacular growth of the Internet in the 80s, this new medium still largely remained the privy of the academics, computer professionals and nerds. But the 1990s changed all that. In less than 10 years, the Internet entered the daily lives of millions of people worldwide and its meteoric growth in the 80s made way for a truly overwhelming explosion. Two landmark events that made this explosion possible were the development of the World Wide Web (WWW) and the associated designing of the graphic web browser.

The advent of the World Wide Web on the Internet represents a turning point in e-commerce by providing an easy-to-use technology solution to the problem of information publishing and dissemination. The Web made e-commerce a cheaper way of doing business (economies of scale) and enabled more diverse business activities (economies of scope). The Web also enabled small businesses to compete on a more equal technological footing with resource-rich multinational companies. The other major innovations included the development of search engines.

The browser and the search engines brought the Internet within the reach of almost anyone with a computer. By the year 2000, according to US Internet Council, the web contained over 2 bn unique pages, 6.4 mn servers and 4.5 mn sites.
Figure 1.3.1 Milestones in the life of the Internet

- 1962: J.C.R. Licklider of MIT envisions his "galactic network" concept.
- 1965: US DoD's Advanced Research Project Association starts work on "ARPANET".
- 1969: Bob Kahn and Vint Cerf begin work on TCP/IP.
- 1972-1973: Electronic mail introduced.
- 1983: First data communication between computers is achieved at UCLA and Stanford.
- 1985: William Gibson uses the term "cyberspace" in his novel "Neuromancer".
- 1990: ARPANET decommissioned.
- 1991: NSFNET dissolved; Sun Microsystems launches JAVA.
- 1995: Mosaic, the first graphics-based web browser, is released.

P. T. Joseph has given the milestones of Internet/e-commerce as under:

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1969</td>
<td>US Department of Defense starts the first network among major research centres in the US.</td>
</tr>
<tr>
<td>1971</td>
<td>15 major connections or nodes established. Email introduced.</td>
</tr>
<tr>
<td>1973</td>
<td>Defense Department started developing various forms of file transfer.</td>
</tr>
<tr>
<td>1984</td>
<td>Domain Name Service (DNS) introduced.</td>
</tr>
<tr>
<td>1986</td>
<td>US National Science Foundation created Internet-based telephone lines.</td>
</tr>
<tr>
<td>1987</td>
<td>The number of hosts (computers on the Internet) reaches 10,000.</td>
</tr>
<tr>
<td>1988</td>
<td>The number of hosts on the Internet crosses 60,000.</td>
</tr>
<tr>
<td>1989</td>
<td>Over 100,000 hosts on the Internet registered.</td>
</tr>
<tr>
<td>1991</td>
<td>The World Wide Web [WWW] created by CERN in Switzerland</td>
</tr>
<tr>
<td>1992</td>
<td>InterNic created to handle Domain Name registration</td>
</tr>
<tr>
<td>1995</td>
<td>A total of 6.6 mn hosts or computers on the Internet.</td>
</tr>
<tr>
<td>July 1996</td>
<td>An estimated 12.8 mn hosts, 212,155 websites and 25 mn users of the Web, about 90% of them in the US.</td>
</tr>
<tr>
<td>July 1997</td>
<td>1.3 mn domain names registered.</td>
</tr>
<tr>
<td>Dec 1997</td>
<td>22 mn servers, 40 mn users on the WWW.</td>
</tr>
<tr>
<td>2000</td>
<td>110 mn users and 72 mn Domain Names.</td>
</tr>
<tr>
<td>2003</td>
<td>802.2 mn users and 233 mn hosts.</td>
</tr>
</tbody>
</table>


The online journal eMarketer put the total number of Internet users at 1.1 bn in 2006.32

The growth of websites over the years is shown in Table 1.3.1.

**Table 1.3.1 Growth in number of hosts over the years**

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of hosts advertised in the DNS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>1,313,000</td>
</tr>
<tr>
<td>1994</td>
<td>2,217,000</td>
</tr>
<tr>
<td>1995</td>
<td>4,852,000</td>
</tr>
<tr>
<td>1996</td>
<td>9,472,000</td>
</tr>
<tr>
<td>1997</td>
<td>16,146,000</td>
</tr>
<tr>
<td>1998</td>
<td>29,670,000</td>
</tr>
<tr>
<td>1999</td>
<td>43,230,000</td>
</tr>
<tr>
<td>2000</td>
<td>72,398,692</td>
</tr>
<tr>
<td>2001</td>
<td>109,574,429</td>
</tr>
<tr>
<td>2002</td>
<td>147,344,723</td>
</tr>
<tr>
<td>2003</td>
<td>171,638,297</td>
</tr>
<tr>
<td>2004</td>
<td>233,101,481</td>
</tr>
</tbody>
</table>

Networks in countries around the world are continuing to join the Internet (often first with e-mail connections and then with full access to Internet services). Countries with at least some Internet access are shown in Figure 1.3.2 and countries with many networks connected are shown in Figure 1.3.3.

**Figure 1.3.2 World Map showing countries with Internet access**


**Figure 1.3.3 Internet connectivity of the major countries on the Internet.**

The Internet has been one of the most influential technological inventions of the late 20th century, and its impact continues into the 21st century. It has influenced the way business and society communicates and conducts transactions, and has also had an impact on the technological development and concept of networking.

The history of the Internet can be divided into seven general stages of development:

1. The early years
2. Experimental networking
3. Discipline-specific research
4. General research networking
5. Privatization and commercialization
6. National information infrastructure
7. High performance computing and communications.

These stages are charted against a timeline in Figure 1.3.4, which summarizes the major events at each stage of the Internet’s development.

**Figure 1.3.4 A summary of the history of the development of the Internet**

The history of the Internet’s development is extremely useful for understanding and managing the process of integrating the Internet into an organization’s communications infrastructure. Table 1.3.2 summarizes the facts about the Internet’s development and the consequences for managers using the Internet today.

**Table 1.3.2 Practical lessons that can be learned from the history of the Internet**

<table>
<thead>
<tr>
<th>History of the Internet</th>
<th>Applied lessons for managers</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is no central authority that controls the Internet</td>
<td>Organisations must control, maintain and police their own infrastructure and use of the Internet in terms of content and access</td>
</tr>
<tr>
<td>It was designed to be robust and to have a decentralised structure so that, in the event of one node being unavailable, the network as a whole would still be able to function</td>
<td>This underlines the reliability of the network as a commercial and social medium for communications and transactions</td>
</tr>
<tr>
<td>It was developed in an academic and research-oriented environment. It was not designed as a commercial channel, neither was security an overriding factor in the design. The primary objective was reliability and efficiency of message transmission and receipt</td>
<td>This underlines the need for each organisation to implement its own security policy and infrastructure to ensure that it protects its assets which become open over the Internet if no protection is put in place</td>
</tr>
<tr>
<td>It was initially designed as a medium to share computer resources and used as a tool to collaborate on-line with partners who were geographically distant</td>
<td>This is one of the greatest benefits of the Internet; and organisations should capitalise on this medium to improve collaboration and cooperation between different organisations efficiently and cost effectively</td>
</tr>
<tr>
<td>Even in the early days, it was increasingly being used for person-to-person communication (e-mail and newsgroups) and not for its original purpose, underlining human beings’ overriding need to communicate with each other by whatever means</td>
<td>This phenomenon continues. No matter how sophisticated the technology and for what purposes it was intentionally designed, users will always find new and different ways of utilising this technology. Organisations should beware of this desire for person-to-person communication and ensure that there are procedures in place to protect against abuse of the medium for which the organisation could be liable (more in Chapter 7)</td>
</tr>
<tr>
<td>Technology is continually improving and so the infrastructure of the Internet can also be improved to meet the growing demands of users</td>
<td>Managers must ensure that the investment they make in their infrastructures incorporates flexibility and the ability to add new technology as and when it emerges</td>
</tr>
<tr>
<td>In the early days, growth in the use of the Internet was exponential – this pattern of growth continues today</td>
<td>Organisations must factor rapid change in technology development into their overall strategy to ensure they can keep up with technology changes and not be left behind by their competitors</td>
</tr>
</tbody>
</table>

1.4 Business models of e-commerce

Business models are one of the most discussed, most hyped and least understood aspects of the World Wide Web. The perception is that a business model is a concept arising out of e-commerce and the Internet era. This, however, is not the case – the concept of a business model is as old as business itself. It is a method of doing business whereby an organization can sustain itself in the short term, and develop and grow in the medium to long term. A well-planned and successful business model will, in the long term, give the business a competitive advantage in its industry, enabling it to earn more profits than its competitors.

Research into Internet-based business models is still in its infancy. However, some scholars, such as Affuah and Tucci and Mahadevan have suggested a framework where a business model can be divided into three major areas that impact on the sustainability and growth of an e-business. These are the revenue stream, the value stream and the logistical stream. These operate in conjunction, and each interacts with and impacts on the others, as can be seen in Figure 1.4.1.

Figure 1.4.1 Components of a business model

Classification of Business Models
Three Major Factors to Consider

LOGISTIC STREAM
Restructure the corporate value chain

REVENUE STREAM
Short-term realization of value proposition

VALUE STREAM
Create long-term sustainability of the business


Michael Rappa, one of the pioneers of on-line open courseware and a leading author in the field of Web-based business, identifies a number of generic business models. In his on-line course “Managing the Digital Enterprise,” he describes these business models as:
Brokerage: In this model, the market makers bring together buyers and sellers and facilitate transactions. Example: e-market-places (including exchanges) and auction sites (eBay, auctionet, price-line); search engines that retrieve information about, for example, prices (easyvalue, mysimon); and virtual malls, such as VirtualMall (UK), hosting a number of on-line retailers.

Advertising – This is a Web-advertising model and extension of the traditional media broadcasting model where websites provide content and services and advertising messages (usually in the form of banners). This model is most effective when the volume of traffic to the site is high or specialized.

Infomediary – This model is basically used for collecting and disseminating information. It can be sold to organizations for marketing purposes, for example, NetZero who provide free Internet access in exchange for user profiles.

Merchant – This is a model where retailers sell goods directly to buyers; e.g. virtual merchants such as amazon.com who only sell on the Web.

Manufacturer – Similar to the merchant model, it involves manufacturers or producers of a good or service using the Web to reach buyers directly, eliminating wholesalers and retailers, for example Dell Computers.

Subscription – This model involves payment of fees to access information or services. Information providers allow access to high-value reports at a cost or for a subscription fee, such as Harvard Business Review or The Economist.

This kind of classification by Rappa combines description of what the business models do with how they make revenue.

Paul Timmers, head of the section in the European Commission in charge of IT research and development programmes for e-commerce, also developed a framework for the analysis and classification of business models. He suggests that the classification of business models can be achieved through ‘value chain reconstruction and de-construction. He identifies possible ways of integrating information along the chain. Using this technique, he identifies 10 different business models (compared to Rappa’s nine) that are illustrated in Figure 1.4.2. Each model is classified according to the different elements of the value chain once it is deconstructed, the interaction patterns (whether 1-to-1, 1-to-many or many-to-1) and identifying where information processing can be integrated into the reconstructed value chain.
Kaplan and Sawhney’s framework classified the different types of e-marketplaces or e-hubs according to how businesses buy and what they buy (summarized in Figure 1.4.3)

![Figure 1.4.2 Timmer’s classification of business models]

**Business Models (2/2)**

- **Virtual communities**
  Focus on added value of communication between members

- **Value chain service provider**
  Support part of value chain, e.g. logistics, payments

- **Value chain integrator**
  Added-value by integrating multiple steps of the value chain

- **Collaboration platforms**
  e.g. collaborative design

- **Information brokers**
  trust providers, business information and consulting

**Business Models (1/2)**

- **e-shop**
  promotion, cost-reduction, additional outlet, (seeking demand)

- **e-procurement**
  additional inlet (seeking suppliers)

- **e-auction**
  electronic bidding (no need for prior movement of goods or parties)

- **e-mail**
  (collection of e-shops), aggregation, industry sector marketplace

- **3rd party marketplace**
  common marketing front-end and transaction support to multiple business

In their matrix, Kaplan and Sawhney specify the type of e-marketplace which can be classified according to their two main criteria. These are

- **Maintenance, repairs and operations (MRO)** – It deals with low-value operating inputs that have relatively high transaction costs. The MRO hubs increase efficiency in the purchasing process and lower transaction costs by aggregating a large number of suppliers in one location.

- **Yield manager** – It provides liquid markets for buying and selling operating resources where suppliers of fixed cost assets or services can sell their excess capacity easily and immediately.

- **Exchanges** – These are similar to commodity exchanges and enable the fast exchange of commodities for production without problems of negotiating contracts.

- **Catalogue** – Here the non-commodity manufacturing input is dealt with which is industry specific and with specific buyer or seller focus.

One of the common methods for classifying e-commerce is by identifying the partners directly involved in the transaction. The framework summarized in Figure 1.4.4 identifies a range of relationships based on the party that initiates the transaction and the party that accepts the transaction. So there are a number of exchanges that take place between the parties before the transaction is completed and fulfilled.

**Figure 1.4.4 Classification of e-commerce by transaction partners.**

<table>
<thead>
<tr>
<th>TRANSACTION INITIATED &amp; ACCEPTED</th>
<th>BUSINESS</th>
<th>CONSUMER</th>
<th>GOVERNMENT</th>
<th>PEER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Business</strong></td>
<td>B-to-B</td>
<td>B-to-C</td>
<td>B-to-G</td>
<td>B-to-P</td>
</tr>
<tr>
<td><strong>Consumer</strong></td>
<td>C-to-B</td>
<td>C-to-C</td>
<td>C-to-G</td>
<td>C-to-P</td>
</tr>
<tr>
<td><strong>Government</strong></td>
<td>G-to-B</td>
<td>G-to-C</td>
<td>G-to-G</td>
<td>G-to-P</td>
</tr>
<tr>
<td><strong>Peer</strong></td>
<td>P-to-B</td>
<td>P-to-C</td>
<td>P-to-G</td>
<td>P-to-P</td>
</tr>
</tbody>
</table>


Each of the categories identified in Figure 1.4.4 is described as
Business-to-business (B-to-B) In this model, exchange of products, services or information takes place between business entities. Web-based B-to-B includes:

- Direct selling and support to business (as in the case of Cisco where customers can buy and also get technical support, downloads and patches online).
- E-procurement (also known as industry portals) where a purchasing agent can shop for supplies from vendors, request proposals and, in some cases, bid to make a purchase at a desired price. Examples of this are the auto-parts wholesaler reliableautmotive.com and the chemical B-to-B exchange chemconnect.com.
- Information sites give information on a particular industry for its companies and their employees. This include specialized search sites and trade and industry standards organization sites. An example of this is new-marketmakers.com, a leading portal for B-to-B news.

Business-to-consumer (B-to-C) In this model, the exchange of products, information or services takes place between business and consumers in a retailing relationship. Some of the first examples of B-to-C e-commerce were amazon.com and dell.com in the USA and lastminute.com in the UK. In this case, the 'C' represents either consumer or customer.

Business-to-Government (B-to-G) Here, the exchange of information, services and products takes place between business organizations and government agencies on-line. This may include:

- E-procurement services, in which businesses learn about the purchasing needs of agencies and provide services.
- A virtual workplace in which a business and a government agency could coordinate the work on a contracted project by collaborating on-line to coordinate on-line meetings, review plans and manage progress.
- Rental of on-line applications and databases designed especially for use by government agencies.

Business-to-Peer Networks (B-to-P) This is the provision of hardware, software or other services to the peer networks. An example of this kind of model is Napster who provided the software and facilities to enable peer networking.
Consumer-to-Business (C-to-B) This is the exchange of products, information or services from individuals to business. A classic example of this would be individuals selling their services to businesses.

Consumer-to-Consumer (C-to-C) In this category consumers interact directly with other consumers. They exchange information such as:

- *Expert knowledge* where one person asks a question about anything and gets an e-mail reply from the community of other individuals, as in the case of the New York Times-affiliated abuzz.com website.
- *Opinions* about companies and products, for example opinions.com.

There is also an exchange of goods between people both with consumer auction sites such as e-bay and with more novel bartering sites such as swapitshop.com, where individuals swap goods with each other without the exchange of money.

Consumer-to-Government (C-to-G) This model, where consumers provide services to government, is one of the rarest used. In fact it is yet to be implemented.

Consumer-to-Peer Networks (C-to-P) This is part of peer-to-peer networking and is a slightly redundant distinction, since consumers offer their computing facilities once they are on the peer network.

Government-to-Business (G-to-B) (Also known as e-government) The exchange of information, services and products between government agencies and business organizations characterizes this model. Government sites now enable the exchange between government and business of

- Information, guidance and advice for business on international trading, sources of funding and support (ukishelp), facilities (www.dti.org.uk).
- A database of laws, regulations and government policy for industry sectors.
- On-line application and submission of official forms (such as Company and Value Added Tax).
- On-line payment facilities.

This improves accuracy, increases speed and reduces costs, so businesses are given financial incentives to use electronic-form submission and payment facilities.
**Government-to-Consumer (G-to-C)** (Also known as e-government). Here, Government sites offer information, forms and facilities to conduct transactions for individuals, including paying bills and submitting official forms on-line such as tax returns.

**Government-to-Government (G-to-G)** (Also known as e-government). It features Government-to-government transactions within and between countries, linking local governments and also international governments, especially within the European Union, which is in the early stages of developing coordinated strategies to link up different national systems.

**Government-to-Peer Network (G-to-P)** As yet there is no real example of this type of e-commerce. A hypothetical example would be a Head of State communicating with his Army, Navy or Air-force chiefs in a situation of transborder emergency.

**Peer-to-Peer Network (P-to-P)** This is the communications model in which each party has the same capabilities and either party can initiate a communication session.

In recent usage, P-to-P has come to describe applications in which users can exchange files over the Internet directly or through a mediating server.

**Peer Network-to-Consumer (P-to-C)** This is in effect peer-to-peer networking offering services to consumers who are an integral part of the peer network.

**Peer Network-to-Government (P-to-G)** This has not yet been used, but if it were, it would be used in a similar capacity to the P-to-B model (mentioned below), with the government as the party accepting the transaction.

**Peer Network-to-Business (P-to-B)** Peer-to-peer networking provides resources to business. For example, using peer network resources such as the spare processing capacity of individual machines on the network to solve mathematical problems or intensive DNA analysis, which requires very high capacity processing power.
This framework can be used by organizations to segment their customers and distinguish the different needs, requirements, business processes, products and services that are needed for each.

Chesher\(^1\) has also classified e-commerce on similar lines but with a slight difference. He has given the following three models based on interaction between companies, their trading partners and their customers.

- Business-to-Employee (B2E)
- Business-to-Business (B2B)
- Business-to-Consumer (B2C)

![Diagram of Predominant categories of e-business](image)


- Business-to-Employee (B2E) – Chesher says that B2E are the 'intra-facing' activities that take place within an organization aimed at using information technology to significantly improve internal communications resulting in faster business processes, cost reduction and other efficiencies when responding to business change initiatives.

- Business-to-Business (B2B) – B2B are the 'inter-facing' initiatives that seek to create strategic electronic links within the supply chain to enable trading partners to improve stock turnover through more effective replenishment action.

- Business-to-Consumer (B2C) – This is a completely new sales channel which opened up with the explosive adoption of the Internet within the home.
P.T. Joseph has classified e-business models in two ways:

- Based on the relationship of transaction parties
- Based on the relationship of transaction types

![Diagram of e-commerce marketplace by P.T. Joseph](image)


**E-Business Models based on the Relationship of Transaction Parties:**

Based on transaction partners, Joseph has classified these models in five categories: B2C, B2B, B2G, C2C and C2B. These are summarized in Table 1.4.1 and the contents of this table are illustrated in the form of a diagram in Figure 1.4.7

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>B2C</td>
<td>Sells products or services directly to consumers.</td>
<td>Amazon.com, autobuy.com</td>
</tr>
<tr>
<td>B2B</td>
<td>Sells products or services to other businesses or brings multiple buyers and sellers together in a central marketplace.</td>
<td>MetalSite.com, VerticalNet.com</td>
</tr>
<tr>
<td>B2G</td>
<td>Businesses selling to local, state, and federal agencies</td>
<td>Gov.com</td>
</tr>
<tr>
<td>C2C</td>
<td>Consumers sell directly to other consumers</td>
<td>Ebay.com, InfoRocket.com</td>
</tr>
<tr>
<td>C2B</td>
<td>Consumers fix price on their own, which businesses accept or decline.</td>
<td>Priceline.com</td>
</tr>
</tbody>
</table>

Besides classifying business models on the basis of transactions, PT Joseph has also classified them on the basis of relationship of transaction types.

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

- Value integration
- Control


Based on these, nine types of transaction can be identified as follows:

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

**Brokerage Model** is characterized by the following features:

The price discovery mechanism is its key-principle.

- It is a meeting point for sellers and buyers.
- Auctions and exchanges are the models of transaction.
- It is a ‘Free Market’.
- It consists of Global Network of Buyers and Sellers.
- It is a Virtual Market space enabled by the Internet.
- It encompasses all types of organizations now.

**Aggregator Model**

Aggregators are the connectors between buyers and sellers. They are involved in the overall process of selection, organization, matching and enabling the customers to create a value about the sellers.

*Figure 1.4.9 The aggregator model*

Info-mediary Model

The organizer of a virtual community is called an information intermediary or info-mediary who helps sellers to collect, manage and maximize the value of information about consumers.

An info-mediary may offer users free Internet access (e.g. NetZero) or free hardware (e.g. eMachines.com) in exchange for detailed information about their surfing and purchasing habits. This is more likely to succeed than the pure advertising model.

Figure 1.4.10 Info-mediary model


Community Model

E-communities cater to groups, of people who come online to serve their common interests and needs, exchange information, share interests, trade goods and services, entertain, and seek help.

Value Chain Model

Here the goal is to develop full and seamless interaction among the members of the chain, resulting in lower inventories, higher customer satisfaction and shorter time to market.

Manufacturer Model

The manufacturer or “direct model” is a predicated on the power of the Web to allow a manufacturer (i.e. a company that creates a product or service) to reach buyers directly and thereby compress the distribution channel. In this model, the manufacturer sells its products through its website.
Advertising Model
The Web advertising model is an extension of the traditional media broadcast model. The broadcaster, in this case a website, provides content and services, together with advertising messages in the form of banner ads. The advertising model only works when the volume of viewer traffic is large or highly specialized.

Subscription Model
Users are charged a periodic—daily, monthly or annual—fee to subscribe to a service. Subscription fees are incurred irrespective of actual usage rates.

Affiliate Model
In contrast to the generalized portal, which seeks to drive a high volume of traffic to one site, the affiliate model provides purchase opportunities wherever people may be surfing.

The affiliates provide purchase-point click-through to the merchant. It is a pay-for-performance model: if an affiliate does not generate sales, it represents no cost to the merchant.

Various research studies on business models of EC show that of all these models, B2B and B2C are the most prominent. These two sectors together account for effectively the entire revenue from e-commerce activities. In view of the major share of these models, this study attempts to obtain more details about them.

B2B Transactions
Some Web analysts maintain that 80% of e-commerce transactions occur between businesses. B2B is the model whereby a company conducts its trading and other commercial activity through the Internet and the customer is another business. This essentially means commercial activity between companies through the Internet as a medium. For example, a printing business that uses the Internet to order paper from a paper company engages in B2B e-commerce. The final consumer of the printing company’s products is not yet involved.

Many B2B transactions occur over Extranets. An individual can enter a company’s website on the Internet, obtain a password, and then join the company’s Extranet to conduct transactions and obtain information not available to the public. Extranets are also used to
connect a company’s corporate Intranet with the Intranets of the company’s suppliers, distributors, and corporate customers, as shown in Figure 1.4.11.

**Figure 1.4.11 Business-to-Business transactions**


One of the most interesting – and potentially lucrative – ways that companies can use B2B e-commerce is to facilitate the contract bidding process. For example, two companies that manufacture plastic bubble wrap can electronically bid on a contract to supply packing materials to an online toy store. The bidding process can take place online in real-time, and the contracting company can notify the winning bidder instantaneously. Both the bidding and the contracting companies save time and money. Figure 1.4.12 demonstrates an online bidding process.
Developments in the B2B sector largely take the form of ‘exchanges’ where a group of companies buying and selling competing goods or producing goods at different levels of a particular value chain can interact and transact online with one another. For instance, Ford and Oracle came together to launch Auto-Xchange, an automotive e-business integrated supply chain and General Motors and Commerce One teamed up to create GM TradeXchange helping suppliers, dealers and other businesses utilize GM’s global purchasing capability. There are several such parallel exchanges – usually industry-specific collections of buyers and sellers – in operation now and the number is growing rapidly.

Several models and classifications have been proposed for B2B commerce. Figure 1.4.13 illustrates marketplace for B2B trading. The model could be oriented to a vertical approach (e.g. wholesale trade, chemicals, construction, and electronics) or to a horizontal approach (e.g. office supply and logistics).
A summary of B2B models is given in Table 1.4.2

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>B2B storefronts</td>
<td>Provide businesses with purchase, order fulfillment, and other value-added services</td>
<td>Staples.com, OfficeDepot.com</td>
</tr>
<tr>
<td>B2B vertical markets</td>
<td>Provide a trading community for a specific industry</td>
<td>HotelResource.com</td>
</tr>
<tr>
<td>B2B aggregators</td>
<td>Provide a single marketplace for business purchasing from multiple suppliers</td>
<td>MetaSite.com</td>
</tr>
<tr>
<td>B2B trading hubs</td>
<td>Provide a market space for multiple vertical markets</td>
<td>VerticalNet.com</td>
</tr>
<tr>
<td>B2B post and browse markets</td>
<td>Provide a market space where participants buy and sell opportunities</td>
<td>CATEX.com, CreditTrade.com, TechEx.com</td>
</tr>
<tr>
<td>B2B auction markets</td>
<td>Provide a market space for buyers and sellers to enter competitive bids for contracts</td>
<td>e-STEEL.com, HoustonStreet.com, AItra.com, FreeMarkets.com</td>
</tr>
<tr>
<td>B2B fully automated exchanges</td>
<td>Provide a market space for the automatic matching of standardized buy and sell contracts</td>
<td>PaperExchange.com</td>
</tr>
</tbody>
</table>


Benefits of B2B

Research undertaken by AMR Research (2001) provides an indication of the likely benefits to be achieved for manufacturers and retailers:

Benefits achieved by retailers include:

- Lower stock levels with typical improvement of 10% to 40%.
- Higher sales volume with typical improvement of 5% to 20%
- Lower logistic costs with typical improvement 3% to 4%
Benefits achieved by manufacturers include:

- Faster replenishment action with typical improvement of 12% to 30%
- Higher sales volumes with typical improvements of 5% to 10%

Intangible e-business B2B benefits that have been identified in practice include, for the seller,

- More time for customer service
- Reduced order entry times
- Faster turnaround/response.
- Lower buffer stock levels
- Strategic trading relationship established

For the buyer:

- Fewer exceptions/mistakes mean reduced processing effort involving telephone calls and E-mails.
- Increased accuracy of replenishment information
- Higher stock turnover
- Reduced warehouse space, yet fewer stock-outs
- Improved tracking and handling
- Dramatically reduced replenishment cycle times

Reports also indicate that business-to-business over the Web is growing, and that the total worldwide value of goods and services purchased by businesses through e-commerce solutions has increased from USD 282 bn in 2000 to USD 4.3 trillion by 2005. This represents a compounded annual growth rate (CAGR) of 73% according to International Data Corp. The report found that companies expect to conduct the bulk of their direct and indirect materials spending through exchanges within three years: ‘We found while companies are disappointed with the benefits they’ve gotten from e-marketplaces, they still see great potential for these intermediaries to make inter-business transactions and collaborations easier and more effective’ (Giga Vice-President Andrew Bartels).

B2B electronic commerce is therefore accounting for the larger part of business.
B2C Transactions

B2C is that model of e-commerce where the exchange of products, information or services takes place between business and consumers in a retailing relationship. 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. B2C e-business models also 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.

The advantages of B2C transactions are:

- Lower costs
- Big opportunities
- Globalization
- Reduced operational costs
- Customer convenience
- Easy availability
- 24x7 access
- Knowledge management

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 1.4.14 depicts the processes involved in B2C.
Figure 1.4.14- Processes in B2C

Steps
1. Visiting the virtual mall
2. Customer registers
3. Customer buys the products
4. Merchant processes the order
5. Credit card is processed
6. Operations management
7. Shipment and delivery
8. Customer receives
9. After-sales service

The B2C or online retailing sector is clearly the most visible and talked about part of e-commerce activities. The most notable among e-retailers around the world is Amazon.com, which started off as a bookseller in 1995 but now offers a variety of goods for sale, ranging from cars and cookware to cameras and cosmetics.
Starting with the sale of low-ticket items such as books and CDs, the B2C sector now has almost all kinds goods and services on offer. For example the online car-seller AutobyTel offers hundreds of cars for sale at its site complete with insurance and financing.

Services have not lagged behind in adopting the web as a major distribution channel. Online stockbrokers such as e-trade offer brokerage services on the Net at significantly reduced prices. Most major banks are now providing online services to their clients complete with online payment orders and fund transfers.

The major product categories in e-retailing include computer hardware/software, airline tickets, music and video, financial brokerage and books. While these categories may account for most of the e-retailing activities around the world, the list of things that one can buy over the Internet is virtually unending and ever increasing.

Some analysts predict that B2B e-commerce transactions will become 20 times more frequent than B2C. Nevertheless, in the public’s mind, the image most closely associated with e-commerce is B2C: a consumer using the Internet to buy a product or service. But not every consumer visits an e-commerce Website with the expressed purpose of buying something. Figure 1.4.15 shows some of the questions a consumer might want to have answered by visiting a company’s website.

**Figure 1.4.15 Customer questions**

Ultimately, a B2C e-commerce site must provide the customer with an easy shopping experience. At the same time, the customer needs to feel that shopping online provides an equal or greater benefit than shopping in a brick and mortar store. Table 1.4.3 compares the online shopping experience with the traditional shopping experience for a consumer who wants to purchase a set of cookware.

Table 1.4.3 – Comparison of online and offline shopping experiences

<table>
<thead>
<tr>
<th>Task</th>
<th>Online</th>
<th>Offline</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Find cookware</td>
<td>Search for “cookware”, “cooking pots”, or “pots and pans” then follow links to likely websites.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Can search sites all over the world at any time.</td>
<td>Check ads for availability, then drive to the shopping mall and check the directory for a store that sells cookware.</td>
</tr>
<tr>
<td></td>
<td>• Possibly time consuming</td>
<td>• Two stores are located</td>
</tr>
<tr>
<td></td>
<td>• Need good Web-searching skills</td>
<td>• No shopping malls nearby</td>
</tr>
<tr>
<td></td>
<td>• Possibly time consuming</td>
<td>• The stores don’t carry cookware</td>
</tr>
<tr>
<td>2 Examine cookware</td>
<td>Read product descriptions</td>
<td>Inspect cookware and ask questions of the sales clerk</td>
</tr>
<tr>
<td></td>
<td>• Frequent Asked Questions (FAQs) provide helpful information</td>
<td>• Sales clerk is knowledgeable and helpful</td>
</tr>
<tr>
<td></td>
<td>• Extensive product descriptions and photos available.</td>
<td>• No sales clerk is available</td>
</tr>
<tr>
<td></td>
<td>• Cannot physically inspect the cookware</td>
<td>• No product information is provided</td>
</tr>
<tr>
<td>3 Comparison shop</td>
<td>Follow links to explore other sites that sell cookware</td>
<td>Go to another store</td>
</tr>
<tr>
<td></td>
<td>• Several sites sell the right cookware</td>
<td>• Find the right cookware</td>
</tr>
<tr>
<td></td>
<td>• Prices and delivery options vary widely</td>
<td>• Can’t find cookware; must drive across town</td>
</tr>
<tr>
<td></td>
<td>• Choosing the right options is difficult</td>
<td>• No other stores in the vicinity</td>
</tr>
<tr>
<td>4 Purchase cookware</td>
<td>Select and purchase that is priced reasonably.</td>
<td>Select and purchase cookware.</td>
</tr>
<tr>
<td></td>
<td>• Transaction is processed quickly</td>
<td>• Transaction is completed quickly and easily.</td>
</tr>
<tr>
<td></td>
<td>• E-mail confirmation is received</td>
<td>• Long lines detract from the shopping experience</td>
</tr>
<tr>
<td></td>
<td>• The online site isn’t secure</td>
<td>• Cannot get a lower price without going to another location.</td>
</tr>
<tr>
<td></td>
<td>• The ordering system doesn’t work</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• No method is provided to cancel the order</td>
<td></td>
</tr>
<tr>
<td>5 Receive cookware</td>
<td>Select a reasonably priced delivery option.</td>
<td>Take the cookware home.</td>
</tr>
<tr>
<td></td>
<td>• Receive the cookware within a few days</td>
<td>• Traffic is light and the distance is short.</td>
</tr>
<tr>
<td></td>
<td>• No delivery in your area</td>
<td>• Need to pay transportation costs.</td>
</tr>
<tr>
<td></td>
<td>• Delivery is too slow</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Delivery charges are too high</td>
<td></td>
</tr>
<tr>
<td>6 Use cookware</td>
<td>Start cooking, but find a defect.</td>
<td>Start cooking, but find a defect.</td>
</tr>
<tr>
<td></td>
<td>• E-mail customer service and get a prompt reply and help.</td>
<td>• Return the cookware, want in line, and get a refund</td>
</tr>
<tr>
<td></td>
<td>• E-mails are not answered</td>
<td>• The cookware was bought on sale—no refunds are allowed.</td>
</tr>
<tr>
<td></td>
<td>• The online company is out of business</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Delivery charges are too high</td>
<td></td>
</tr>
</tbody>
</table>


Thus businesses today can increase their turnover by leveraging on this medium. E-Commerce has certainly proved beneficial to both businesses and consumers in many ways, adding value to the economic development of the nation.
1.5 Applications of E-Commerce

Many people think EC just means having a website, but it is much more than that. It has dozens of applications such as home banding, shopping in online stores and malls, buying stocks, finding a job, conducting an auction, and collaborating electronically on research and development projects. To execute these applications, it is necessary to have supporting information and organizational infrastructure and system. Figure 1.5.1 shows that the EC applications are supported by infrastructures, and their implementation is dependent on four major areas (shown as supporting pillars): people, public, technical standards and protocols, and other organizations. The EC management coordinates the applications and the pillars.

Turban has divided Applications of EC into three categories:

1. Buying and selling goods and services. These are usually referred to as electronic markets.
2. Facilitating inter- and intra-organization information flow, communication and collaboration. These are sometimes referred to as Inter organizational systems.
3. Providing customer service.

Electronic Markets

A market is a network of interactions and relationships where information, products, services and payments are exchanged. When the marketplace is electronic, the business centre is not a physical building but rather a network-based location where business interactions occur (Figure 1.5.2). As can be seen in the figure, the electronic market is the place where shoppers and sellers meet. The market handles all the necessary transactions, including the transfer of money between banks.

![Figure 1.5.2: Electronic markets](image)

In electronic markets, the principal participants—transaction handlers, buyers, brokers, and sellers—are not only at different locations but seldom even know one another. The means of interconnection vary among parties and can change from event to event, even between the same parties.

**Inter-organizational Information systems (IOS)**

An IOS involves information flow between two or more organizations. Its major objective is efficient transaction processing such as transmitting orders, bills and payments using EDI or extranets; all relationships are predetermined; there is no negotiation, just execution. In contrast, in electronic markets, sellers and buyers negotiate, submit bids, agree on an order, and finish the execution on- or offline. The Inter organizational systems are used exclusively for B2B applications, where as electronic markets exist in both the B2B and B2C cases.

**Types of inter-organizational systems**

The term IOS describes a variety of business activities, some of which are used in non-EC-related activities. The most prominent types of inter organizational systems are as follows:

- Electronic data interchange [EDI], which provides secured B2B connection over value-added networks [VANs]
- Extranets, which provide secured B2B connection over the Internet
- Electronic funds transfer
- Electronic forms
- Integrated messaging—delivery of e-mail and fax documents through a single electronic transmission system that can combine EDI, e-mail, and electronic forms
- Shared databases—information stored in repositories is shared between trading partners and is accessible to all. Such databases are often used to reduce elapsed time in communicating information between parties and arranging cooperative activities. The sharing is mainly done over extranets.
- Supply chain management (SCM)—cooperation between a company and its suppliers and/or customers regarding demand forecasting, inventory management, and orders fulfillment can reduce inventories, speed shipments, and enable just-in-time manufacturing.
Customer service and support

The Internet offers several ways to provide customer support. If one has a Web server, one can answer customer questions using a Web browser. Such questions may be directed toward support staff. Questions that are often asked may be included in a separate file. Such a list might be distributed by e-mail, the Web, and Usenet news.

Kalakota and Whinston take a holistic view and identify the different components of business and technology that make up e-commerce. Using the analogy of the architecture of a building illustrated in Figure 1.5.3, they explain how the different components fit and interact together, emphasizing the relative importance of each.

All these elements interact to produce the most viable manifestation of e-commerce. These applications include on-line banking and financial trading; recruitment; procurement and purchasing; marketing and advertising; auctions; shopping etc.

Figure 1.5.3: A Framework for electronic commerce

![Diagram of electronic commerce applications and infrastructure]

The scope of E-commerce has become extremely broad and now appears in many aspects of corporate and home life. Simply, old processes have been discarded to make way for effective ways of doing things that are becoming the norm in some areas of business activity (Figure 1.5.4).

Figure 1.5.4: Electronic business structure


Scope of e-business
New functions have emerged in response to business needs that are only possible with the advances of technology. This section examines some of the examples of e-Business in action to illustrate its increasing relevance and scope.
Electronic auctions

Auctions online are exploding.\(^\text{58}\) These are advantageous for both buyers and sellers. Sellers can reach millions of bidders and pay small commissions; buyers can find what they want from their homes. Under normal conditions, goods are advertised and people then attend the auction of the goods at an agreed time and place. Bidding often starts with a reserved price set by the seller. Buyers bid over and above this price until the highest offer is made. The final bidder lays claim to the goods. A similar approach applies in electronic auctions. An example is Ebay.com, which has a significant presence with competition from other companies including QXL.com. In addition to listing fees, EBay charges sellers 5% of the winning bids, although there is a ceiling set, while QXL charges 4% of the winning bid, with a ceiling set higher than EBay.

Electronic gambling

It is currently illegal to operate online casinos in most of Europe and North America. This has forced operators to set up facilities in places in the Caribbean or South America where no such restrictions apply. There are approximately 1,500 e-gambling websites operating and the number is growing.

Electronic banking

The banking industry was the first to operate EDI for funds transfer between banks on a global basis, using the SWIFT network. Indeed, banking appears to be an obvious candidate for e-Business. Banks are among the most intense users of technology and are involved in
some of the more exciting developments on the Internet such as secure payment technologies, transaction-enabled Websites and advanced customer relationship management. Many banks have identified Internet banking as a key route to increase their market share and retain customers. More than 1,000 US banks have or plan to have fully transactional Web sites. European banks have also been quick to embrace Electronic Business as a competitive weapon.

**Electronic Insurance**

E-mail is also being used for many insurance activities, for instance, to communicate with customers, agents at other offices or agents working at home. Insurance companies are marketing their services more aggressively via the Internet. They are providing facilities for customers to get quotes and access to other services online.

In a recent survey, a group of insurance executives, when asked their e-business objectives, rated improving customer services their top priority. First, they wanted to inform customers about the insurance products they had purchased. The next two most important areas were the executives’ ability to more rapidly introduce new services and to reduce expenses. Figure 1.5.6 shows how online insurance becomes a time-effective process.

**Figure 1.5.6: Online service can reduce the time needed to process and ship an insurance contract from weeks and days to hours.**

Electronic government

E-government is not a business model *per se*, but many national and international governments are pursuing a policy of e-government, enabling electronic access to a whole range of information and services both to individual citizens and to businesses. More than being about new technologies, eGovernment is about how governments can make life easier for citizens and companies by serving them better.

Administrations around the world have been quick to realize the potential of the Internet to improve communications between government and citizens (G2C). Already, access to numerous websites provides a wealth of information on subjects ranging from legislation proceeding through governmental bodies to position papers on topics of high public interest. This not only applies to central government but to many administrative departments such as those dealing with income tax and state pensions. In addition, local government authorities are encouraging the use of E-mail as an effective and speedy means of communication between relevant departments and members of the public.

Electronic learning

With the ever-increasing demand for education and learning across the world, there has emerged a need to examine new ways of course delivery that enhance the learning experience of the student. The new generation of e-learning tools delivered over the Internet/Web offer greater possibilities to engage the student in a powerful alternative to traditional face-to-face learning, or at least to complement it.

Supply chain evolution

Even though there are many B2B applications, the relationships between businesses can be best understood in the supply chain context. Consider something as mundane as the manufacturing and distribution of cereal. The overall process is shown in Figure 1.5.7 (Handfield and Nichols, 1999). It actually consists of a number of interrelated processes and roles, all the way from the acquisition of grain from farmers (or other grain suppliers), to the processing of the grain into cereal, packaging it into boxes, transporting the packaged cereal to distributors and grocers, and eventually its purchase by end consumers. Taken together these processes and roles are called a supply chain. As shown in Figure 1.5.7 the supply chain can be broken into three parts – upstream activities involving material and service inputs from suppliers, internal activities involving the manufacturing and packaging of goods, and
downstream activities involving the distribution and sale of products to distributors and customers.

In the 1990s business managers came to recognize that management and control of the upstream and downstream activities – involving relationships with partners who are technically outside the enterprise – are as important as the internal activities involved in the actual production of products, and can be made more effective with the use of the Internet. Historically, many of the processes in the supply chain, especially the upstream and downstream activities, have been managed with paper transactions (e.g. purchase requisitions and orders, invoices, and so forth). This is where B2B applications come into play. They serve as supply chain enablers that can offer a distinct competitive advantage.

Chesher has emphasized on the evolution phase of the supply chain. It has developed dramatically over the last 20 years from trading partners dealing with one another in a rigid
paper-based environment, usually in adversarial roles. This evolution is depicted in Figure 1.5.8, moving from a starting point of separate internal departments to departmental functional integration, e.g. Purchasing and Material Control merged into Materials Management. There followed a period in which the internal functional departments became integrated through transparency and sharing of data and information made possible by Enterprise Resource Planning (ERP) or similar other packaged applications. This provided manufacturers with considerable cost savings through process improvements and lowering of inventory levels, but still left inefficiencies within the total supply chain. The more recent phase concerns full external integration with trading partners across the total supply chain, resulting in further reductions in inventory levels. This became possible with the use of the Internet for these functions.

**Figure 1.5.8: Supply chain evolution**


**Investing Online**

One of the fastest growing online businesses is online trading. It is inexpensive, convenient, and supported by a tremendous amount of financial and advisory information. Trading is very fast and efficient, almost fully automated, and it is moving to the Net.63
The rapid growth of online trading has shown the financial services industry a radically different way of doing business, one in which the client does much of the work and in return pays lower charges.

In the US there are clear signs that online investing is a mass-market phenomenon exemplified by the success of companies such as Charles Schwab and E*Trade, which have pioneered low-cost share trading on the Internet.64

**Online Retailing**

Online retailing has witnessed constant rise in terms of its value in dollar billions. Commerce on the Internet is especially suitable not only for digital products but also for commodity-like products that one does not need to touch, smell, or try on. The Internet may also be used to link different aspects of the sales cycle, giving rise to new services and channels, as when sales are linked to online catalogues and order forms.65 Retailers like the Web for its lower costs, innovation, access, and reach. Setting up a Web storefront is a major aspect of EC advertising activities, especially for multimedia and video products.

For many consumers, the principal attraction of the Internet lies in its promise of cheaper shopping.66 Books, CDs and travel have been the areas that have benefited most from the greater price transparency that the Internet brings. The same thing is starting to happen with other consumer products, even big-ticket items such as motor cars.

US car buyers are turning to the Internet to find the best price for their desired model. Just a few hours spent comparing cars and prices on the Internet can produce big savings. This also allows them to delay the moment when they have to confront a car salesperson—for many, an unpleasant experience.

One US Company, Autobytel.com, has created a highly popular web site for car buyers. Expanding internationally, it has launched Autobytel.se in Sweden and was preparing to launch a UK version, Autobytel.co.uk, in mid-1999.

Many potential buyers are attracted to Autobytel because it eliminates much of the hassle and uncertainty in buying a car. Customers enter the make and model of car they want, how much they are willing to pay, and whether they would like to buy from a dealer or a private seller. They then tell the site how far they are prepared to travel to buy the car. Within seconds, they
can view an exhaustive list of all the cars for sale within a given distance from home, including prices, photographs and detailed descriptions of each vehicle.

After deciding which car to buy, the customer enters the ZIP code where he or she lives and the make and model of the car desired. A screen pops up requesting further details such as the desired exterior and interior color schemes or the size of engine. Then the customer completes a new car purchase request, selecting which manufacturer options such as radio or anti-lock brakes, to include in the car. With these selections and some contact information for the customer, the request goes to the Autobytel dealer closest to the customer’s home. Within 24 hours, the dealer contacts the customer with a fixed price, thus eliminating the traditional and—for many buyers—unpleasant process of haggling over price. Even financing and insurance can be arranged online.

The dealer explains the options and all the paperwork is prepared before the customer arrives to complete the transaction and pick up the car. The customer is also asked whether or not he or she wishes to acquire service agreements or after-market products available from the dealer.

**Travelling on**

E-commerce creates much stronger competition among travel agencies, and the industry is being transformed to direct marketing operations. The role of travel agents is changing, and many will disappear. The survivors will be those whose service offers better value-addition.

According to a study by the World Travel & Tourism Council (WTTC) sponsored by Accenture and prepared by Oxford Economics, the world travel and tourism market will top USD 13 trillion by 2017, up from USD 7 trillion in 2007. Leading the way, US travel and tourism revenues are expected to reach USD 1.7 bn in 2007.

The study predicts that China's travel and tourism market will grow 9.6% annually through 2017, at which point it will be the second-largest, surpassing current runner-up Japan. Montenegro, China and India are the fastest-growing travel and tourism markets worldwide, with demand growing annually by 10.1%, 9.1% and 7.9%, respectively. In a decade, the Russian Federation will move into the top 10 countries in travel and tourism.
Most services available in a physical travel agency are also available online. In addition, customers get much more information, usually quicker. Customers log on to a virtual agency, prepare their desired trip plan, and receive bids from providers. They can even set a maximum price they are willing to pay for transport, accommodation, events, and more. They can compare prices, participate in auctions and chat rooms, and view videos and maps.

Advertising and the media
Selling digital information or "content" is another potential way to make money on the Internet. In the early days of the Internet, the industry's favorite phrase was "Content is king." It was believed that if you filled a website with enough high-quality content, people would pay to visit it. About 10% of those surfing the Web click on advertisements.

Interactivity is a cornerstone of Internet advertising. The Internet is good for targeting advertising to specific consumers, taking into account their needs and tastes, product features, technologies of processing data, and the means to convey the information. Figure 1.5.9 and 1.5.10 throw light on advertising spending on and revenue earned through the Internet.

Newspapers were among the first to spot the potential of the Internet in reaching a wider audience than physical distribution would allow. Today nearly every major national newspaper has an online presence, as do many local papers. Some editions put up a small selection of each day's stories, or only allow full online access to subscribers of the paper product. Others give online users more than to traditional readers, including multimedia, searchable archives and hyperlinks to websites of the companies mentioned in a story. A more recent development is to offer rolling news services in which stories are posted on the website as they develop - up to 24 hours before they appear in the print version.
Figure 1.5.9: US online advertising spending

<table>
<thead>
<tr>
<th>Year</th>
<th>Total media</th>
<th>Internet</th>
<th>Total media without Internet</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>2.8%</td>
<td>20.3%</td>
<td>1.7%</td>
</tr>
<tr>
<td>2006</td>
<td>3.7%</td>
<td>26.8%</td>
<td>2.5%</td>
</tr>
<tr>
<td>2007</td>
<td>1.4%</td>
<td>15.1%</td>
<td>0.6%</td>
</tr>
<tr>
<td>2008</td>
<td>3.0%</td>
<td>17.5%</td>
<td>2.0%</td>
</tr>
<tr>
<td>2009</td>
<td>-1.9%</td>
<td>9.8%</td>
<td>-2.8%</td>
</tr>
<tr>
<td>2010</td>
<td>-1.4%</td>
<td>6.8%</td>
<td>-2.1%</td>
</tr>
</tbody>
</table>

Note: eMarketer benchmarks its US online advertising spending projections against the Interactive Advertising Bureau (IAB) and PricewaterhouseCoopers (PwC) data, for which the last full year measured was 2005. eMarketer benchmarks its US total media ad spending projections against the Universal McCann data, for which the last full year measured was 2005. Source: eMarketer, September 2006.

Online ad spending revenues totalled USD 16.8 bn in 2006, up from 12.5 bn in 2005.

Figure 1.5.10: US online advertising revenue,

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenues (billions)</th>
<th>% Increase vs. Prior Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>$12.5</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>$16.8 (24.0%)</td>
<td></td>
</tr>
</tbody>
</table>

Source: Interactive Advertising Bureau (IAB) and PricewaterhouseCoopers (PwC), March 2007

For specialist trade and scientific publishers, the subscription model can be attractive. The cost of publishing an electronic magazine accessible through a subscription-only website can be less than printing and distributing traditional paper publications. The magazine continues to offer premium content that is only available to subscribers. Publishers say the number of subscribers, approaching 30,000, actually increased after adopting the free-content model.

Radio stations, record producers and TV broadcasters have also taken to the Web in a big way. The publishing and media industries like the Internet because it offers a new way to distribute their products. They are also driven by advertisers, who want to include the Internet in the media “mix” for their campaigns.
Finance on the Web

Financial services are moving online, frequently in an integrated fashion: stocks, banking, personal finance, and insurance, all in one stop.\textsuperscript{70} Strong growth is seen in all financial services, making markets more efficient.

E-commerce allows for fund transfers and electronic payments between buyers and sellers. Banks are now exposed to digital currency and electronic cheques. Software allows for connection to both credit card and banking networks; thus banks are expanding their private networks to interface with the Internet.\textsuperscript{71}

E-commerce can be used not only for billing and payment but also for escrow, managing cash, financial data and reporting, foreign currency exchange, and investment services.

Marketing applications\textsuperscript{72}

The many marketing applications of e-commerce include

- Providing marketing channels.
- Testing pricing strategies.
- Providing post-sale customer support.
- Rendering satisfactory customer service and support.
- Targeting specific audiences.
- Providing detailed product and service information to potential customers.
- Enhancing customer relationships.
- Fostering and communicating product differentiation.
- Test marketing.
- Engaging in market research.
- Establishing a customer base.

Electronic Data Interchange (EDI)

EDI is computer-to-computer communication of standard business transactions in a standard format. It enables companies to exchange business documents in a standardized fashion over the Internet (or networks) either through Web-based forms for recording EDI transactions with a services company on the Internet, or by e-mail for EDI transmission to business partners.
Electronic catalogues: Selling made simple

The Internet also becomes an additional channel for sales, marketing and public relations activities. A recent INPUT study shows that the four main goals of adopting e-commerce in the US are penetration of new markets, meeting competition, reducing operational costs, and reducing order-to-delivery time.

The e-procurement area has attracted great attention from the e-business industry. Many vendors offer software that allows buyers or sellers to create “e-catalogues” in which companies can display the goods they sell – so-called sell-side systems – or details of orders they wish to fulfil – buy-side systems.

E-catalogues offer many benefits over traditional sales channels such as printed catalogs and direct sales. Putting a sophisticated sell-side catalogue on the Web can provide rich, personalized product information to customers in an efficient, automated process that is available 24 hours a day as shown by Figure 1.5.11.

**Figure 1.5.11: Benefits of electronic catalogues for vendors (INPUT)**

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Importance</th>
<th>Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provides Richer Product Information</td>
<td>4.5</td>
<td>4.9</td>
</tr>
<tr>
<td>Strengthens Relationship with Current Customers</td>
<td>4.0</td>
<td>4.8</td>
</tr>
<tr>
<td>Reduces Numbers of Staff Needed in Sales Process</td>
<td>3.4</td>
<td>3.7</td>
</tr>
<tr>
<td>Access to New Customers</td>
<td>3.7</td>
<td>4.0</td>
</tr>
<tr>
<td>Decreases Order Processing Time</td>
<td>3.5</td>
<td>3.3</td>
</tr>
<tr>
<td>Greater Order Tracking and Control</td>
<td>3.1</td>
<td>3.1</td>
</tr>
</tbody>
</table>


Kaut Bullinger, one of Germany’s leading office supplies companies, was quick to realize the advantages of this type of Electronic Business. It has been running a highly successful electronic catalogue operation covering more than 8,000 products since 1997. The use of the
online catalogue pleases customers and it benefits Kaut Bullinger, which has been able to streamline its “offer-to-order” and “order-to-pay” processes. The savings achieved are passed on to the customer in lower prices. Customers no longer need to identify product numbers or their discount terms as the site handles these complexities. Unlike printed catalogues, dynamic electronic catalogues display information that is current and complete. Also, each business customer can see the products, prices and features unique to his or her company.

**E-catalogues: buying made better**

On the buy side, e-catalogues are empowering purchase departments within companies by allowing better enforcement of business rules, leveraging supplier relationships for price discounts and allowing them to focus on strategic issues. The most important benefit by far is reducing the cost of products purchased from suppliers. Suppliers gain from the higher volume of sales and the stronger relationship with their customers. Of course the buying organization can accomplish this without the use of e-catalogues, but INPUT research shows that e-commerce applications make it easier to funnel purchases to selected suppliers and this facilitates negotiated price reductions.

**Figure 1.5.12: Benefits of e-catalogues for buyers (INPUT)**

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Average Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduces Costs of Purchased Products</td>
<td>4.4</td>
</tr>
<tr>
<td>Lowers Procurement/Ordering</td>
<td>4.7</td>
</tr>
<tr>
<td>Richer Product Information</td>
<td>4.4</td>
</tr>
<tr>
<td>Decreases Order Processing Time</td>
<td>4.3</td>
</tr>
<tr>
<td>Decreases Errors/Mistakes</td>
<td>4.1</td>
</tr>
<tr>
<td>Simplifies the Process of Identity</td>
<td>3.7</td>
</tr>
<tr>
<td>Decreases Number of Rogue Purchases</td>
<td>3.6</td>
</tr>
<tr>
<td>Decreases Number of Staff Needed</td>
<td>3.6</td>
</tr>
<tr>
<td>Greater Order Tracking and Control</td>
<td>3.6</td>
</tr>
<tr>
<td>Ability to “Comparison Shop”</td>
<td>2.5</td>
</tr>
<tr>
<td>Access to a Larger Number of Products</td>
<td>2.3</td>
</tr>
<tr>
<td>Access to a Greater Number of Suppliers</td>
<td>1.6</td>
</tr>
</tbody>
</table>

**Online job market**

The online job market is growing rapidly, matching millions of jobs annually with job seekers. The major driver of online job markets is the ability to reach a large number of job seekers at low cost, to provide detailed information online, to take applications, and even to conduct tests. Also, using intelligent agents, resumés are checked and matches are made quickly. Benefits occur to employers, job seekers, government agencies and successful employment agencies.

**Electronic real estate market**

The online real estate market is supporting rather than replacing existing agents, helping to save time and effort of both buyers and sellers. One can buy distant properties more easily, and lately one can get less expensive services. Eventually, commissions on regular transactions will decline.

**Innovative service industries applications**

Hundreds of other services are coming online, notably publishing, knowledge dissemination, distance learning and training, insurance, document management, electronic stamps, matchmaking, astrology and much more.

**Products**

Products available on the Web may be classified as soft goods ("bitable," information) and hard goods (nonbitable, tangible). Bitable goods are those that can be delivered via the Net, like software, information, and certain types of money. Nonbitable goods like clothing and furniture must be physically delivered. Both categories of products can be sold in e-commerce.

Products may also be classified as commodity or non-commodity goods. Commodity goods are those that customers do not have to visualize, try on, smell, taste, or touch before placing an order. Bitable commodity goods are the best for e-commerce. Non-commodity goods may be reduced to commodity goods in the minds of consumers if, based on their experiences, they are comfortable ordering them; a typical example might be ordering slacks of a certain size from L.L Bean or Land's End.
Conclusion

As seen from its applications, E-Commerce has touched all areas of business activities, be it supply chain management or marketing activities, be it a manufacturing industry or service industry. Almost all the areas have been affected and benefited by the use of Internet. It has really brought time and cost savings to both the buyers and sellers. Hence the impact of e-commerce cannot be ignored any more. To survive in the cut-throat competition arena, organizations have to embrace this medium, lest they are left behind in the race.
1.6 Benefits of E-Com

Few innovations in human history encompass as many potential benefits as EC does. The global nature of the technology, low cost, opportunity to reach hundreds of millions of people (projected within 10 years), interactive nature, variety of possibilities, and resourcefulness and rapid growth of the supporting infrastructures (especially the Web) result in many potential benefits to organizations, individuals, and society. These benefits are just starting to materialize, but they will increase significantly as EC expands.

Figure 1.6.1: Value-creation of an e-marketplace.


Benefits of Electronic Commerce to Organizations

Worldwide visibility
Electronic commerce expands the marketplace to national and international markets. What used to be a single physical marketplace located in a geographical area has now become a borderless marketplace. By becoming e-commerce enabled, businesses now have access to
people all around the world. With minimal capital outlay, a company can easily and quickly locate more customers, the best suppliers, and the most suitable business partners worldwide. For example, in 1997, Boeing Corporation reported savings of 20% after a request for a proposal to manufacture a subsystem was posted on the Internet. A small vendor in Hungary answered the request and won the electronic bid. Not only was the subsystem cheaper, it was delivered quickly.

With the Internet reaching all corners of the world, it is economically possible for even the smallest business to engage in global trade. Also, small companies can now advertise globally for a very small price.

Cost containment
The Web can provide cost savings to business in a variety of areas – it has a very good cost-per-user ratio. In marketing and advertising, it allows an organization to reach a large number of potential customers rather inexpensively. Also the Web allows a company to keep its information and price sheets fresh, without reprinting expensive four-colour brochures. When prices change frequently, printed catalogues can become outdated before they reach the customer. This problem can be eliminated by e-commerce. When a price change is needed, a simple change of the Web page will correct it. This saves money on catalogue printing.

E-commerce decreases the cost of creating, processing, distributing, storing, and retrieving paper-based information. For example, by introducing an electronic procurement system, companies can cut the purchasing administrative costs by as much as 85%. The more the customers that use e-commerce to buy products, the less is the need for telephone operators and salespeople. While doing away with these employees entirely is not practical, a reduction in their numbers can reduce variable selling and administrative expenses. Moreover, e-commerce lowers telecommunications costs as the Internet is much cheaper than VANs.

Better overhead and inventory control
Using Internet-based purchasing, inventory control can be made simple. When a shipment is received, the quantity is entered into a computer database. As customers order products and they are shipped, the computer can track the quantity remaining in stock. It not only warns about inventory but also gives an hour-by-hour picture of what is moving and what is not.
E-commerce allows reduced inventories and overheads by facilitating “pull-type” supply chain management. In such a system the process starts with customer orders and uses just-in-time manufacturing. Such processing enables a degree of customization of products and services that provides competitive advantage to businesses.

Greater efficiency
The Web provides opportunities for B2B transactions that can result in greater efficiency. For example, FedEx, provides a page on which one can track the delivery of one’s packages easily, cutting down on long phone calls searching for lost packages. Figure 1.6.2 shows the FedEx tracking page.

Other benefits include improved image, improved customer service, new found business partners, simplified processes, compressed cycle and delivery time, increased productivity, elimination of paper, expeditious access to information, reduced transportation costs, and increased flexibility.
To best serve the customer, a detailed description of each product can be put on the Web page, with details like prices, dimensions, test results, pictures, and even Virtual Reality files that let the customer look at the object in three dimensions.

It is relatively cheap to acquire new customers over the net owing to 24x7 operations and global reach. Through innovative tools of ‘push’ technology, it is also possible to retain customer loyalty with minimal investment. The Net has the power to provide the ‘best of both worlds’. It benefits the traditional business side-by-side with the Internet tools.

**E-commerce creates highly specialized business**
For example, dog toys which can be purchased only in pet shops or department and discount stores in the physical world, are sold now at a specialized www.dogtoys.com (also see www.cattoys.com website.

**E-commerce reduces time between capital outlay and receipt of products and services.**
**E-commerce initiates business processes reengineering projects.**
By changing processes, productivity of salespeople, knowledge workers and administrators can increase by 100 percent or more.

**A technology-based customer interface**
The customer interface in the e-commerce is a ‘screen-to-face’ interaction. These interfaces have the potential to both increase sales and decrease costs.

**An extended enterprise is easy to build**
Every enterprise today is part of the ‘connected economy’; it has to be extended all the way to suppliers and business partners such as distributors, retailers, and ultimately end-customers. The Internet provides an effective (often less expensive) way to extend your enterprise beyond the narrow confines of your own organization. Tools such as ERP, SCM and CRM, can easily be deployed over the Internet, permitting amazing efficiency in managing time needed to market, customer loyalty, on-time delivery and eventually profitability.

**Customized offerings**
When Ford first started making motor cars, customers could have ‘any colour so long as it was black’. Now a car can be configured to a customer’s specifications within minutes on-line via the www.ford.com website. While the customer controls the interaction, the firm
has unprecedented opportunity to observe and track individual consumer behaviour. Armed with this information, companies can provide one-to-one customization of their offerings.

Recruitment
Many businesses are using Web pages to recruit employees, consultants, and contractors. Web pages have a long reach, and can provide in-depth information about business to potential employees.

Benefits to Consumers
The benefits of EC to consumers are as follows:

24 hours a day/7 days a week Availability
Round-the-clock operation is an expensive proposition in the 'brick-and-mortar' world, while it is natural in the 'click-and-conquer' world. Keeping a retail establishment open all the time can be very costly. E-commerce is a great way to get the business of these off-peak shoppers. For a very small amount of money, a company can have its “cyber-shop” open round the clock, offering the major benefits of enabling customers to shop or do other transactions 24 hours a day, all year round, from almost any location.

More choices
E-commerce provides customers with more choices; they can select from many vendors and from more products. They not only get a whole range of products to choose from and customize, but also an international selection of suppliers.

Price comparisons
Customers can ‘shop’ around the world and conduct comparisons either directly by visiting different sites, or by visiting a single site. Electronic commerce frequently provides customers with less expensive products and services by allowing them to shop in many places and conduct quick comparisons.

Improved delivery processes
EC allows quick delivery especially in case of digitized products. This can range from the immediate delivery of digitized or electronic goods such as software or audio-visual files by downloading via the Internet, to the on-line tracking of the progress of packages being delivered by mail or courier.
Detailed information in short time
Customers can receive relevant and detailed information in seconds, rather than days or weeks.

Facilitates numerous transactions/activities
- E-commerce makes it possible to participate in virtual auctions.
- E-commerce allows customers to interact with other customers in electronic communities, exchange ideas compare experiences.

Provides an environment of competition
E-commerce facilitates competition, resulting in substantial discounts. It offers opportunities where substantial discounts can be found or value added, as different retailers vie for customers.

The customer controls the interaction
At most websites, the customer is in control during screen-to-face interaction. S/he controls the search process, the time spent on various sites, the degree of price/product comparison, the people with whom s/he comes in contact, and the decision to buy.

Customer Service and Technical Assistance
Many companies are providing technical support to customers. This includes online information, software, and interaction with technical staff plus, in some cases, assistance in solving problems by way of a database of frequent "fixes".

These pages can provide:
- Announcements of special sales
- Company product descriptions
- Documentation
- Newsletters
- Pictures and drawings of products
- Price sheets
- Product problem alerts
- Software patches
- Specification sheets
- Technical notes
- Upgrade information
Benefits to Society
The benefits of EC to society are as follows:

Enables more flexible work practices
This enhances the quality of life for a host of people in society, enabling more individuals to work at home and to travel less for shopping, resulting in less traffic on the roads and lower air pollution.

Improves the standard of living
E-commerce allows some merchandise to be sold at lower prices, so less affluent people can buy more and improve their standard of living.

Makes products more affordable
E-commerce enables people in developing countries and in rural areas to enjoy products, services, information and interaction with other people. These facilities would not otherwise be so easily available to them. This includes opportunities to acquire professional skills and earn college degrees.

Facilitates public services
E-commerce facilitates delivery of public services, such as healthcare, education, and distribution of government social services at a reduced cost and/or improved quality. Healthcare services, for example, can reach patients in rural areas.

An attractive option for the physically challenged
Online shopping not only appeals to those who don’t actually shop, it also appeals to some people who wouldn’t otherwise be able to shop easily, among them the mobility-challenged.

Public and Community Relations
Many public relations activities are possible on the Internet and the Web. One can appropriately distribute news releases, sponsor events, make publications available, or support nonprofit groups. For example, NSTN, through its True North website, provides a wide variety of community information on its Cybrary pages, including access to other sites and to resources maintained by NSTN.
Other Benefits

Intranets and Extranets are among the most used applications of e-commerce. Figures 1.6.3 and 1.6.4 show the benefits of these applications.

Figure 1.6.3: Uses of intranets by business

![Chart showing uses of intranets by business](chart-intranet-business.png)


Figure 1.6.4: Uses and users of an extranet

(www.livingnet.com accessed September 2000)

![Chart showing uses and users of an extranet](chart-extranet.png)

Paul Timmers has given the following reasons for e-commerce growth:

- **Internet commerce has a low entry cost** compared to other solutions such as EDI. One calculation shows that the difference can be as large as a factor of 25. A Web presence need not cost more than a few dollars per year. For that amount one can have a Web page hosted on a server and online access for maintenance. Of course, a Web presence on its own does not deliver much competitive advantage when a massive presence of companies on the Web becomes a reality in the next few years.

- **With low entry cost, a fast return on investment** is also possible. IMRG quotes a return on investment of weeks, where previously business used to think of several years, although clearly this depends on the kind of application. A supplier who puts a catalogue online can build in direct support for regular customers with electronic ordering. Eliminating paper in the ordering and delivery process can lead to enormous savings, of a factor of 10 to 100. Therefore Internet commerce can offer immediate cost savings. Internet e-commerce start-ups can also break even quickly. Several of the new Internet companies presented during an Internet electronic commerce contest in France early 1999, eLectrophées, were already profitable within a year.

- **Internet commerce has the promise of protecting investment.** Whereas EDI-based systems have a tendency to be specific to the trading or supply-chain relationship, there is the hope that Web-based systems will be interoperable among suppliers. In this way, switching costs are low and there is no need to buy multiple systems. A single PC can support trading relationships with a multitude of business partners. Internet commerce is based on open networks and standards, thereby helping to avoid lock-in.

- **Internet commerce offers connectivity and communication.** Access to the Internet usually means having an e-mail account and being able to browse the WWW. E-mail can bring immediate benefits in business-to-business commerce. Time can be saved by sending (simple) advertisements, order and delivery confirmations and enquiries via e-mail rather than by normal mail or even fax.

- **Internet commerce meets information needs.** To meet information needs it is sufficient to have a browser and surf the Web. It is not necessary to create a presence
on the Web for the company itself. Information can be collected about offers, opportunities, competition, market trends, etc.

- Internet commerce has already built up a critical mass, which attracts even more users and providers of the technology and of business solutions. In addition, governments and public authorities worldwide actively promote the use of the Internet for business. This creates confidence that electronic commerce over the Internet is a viable proposition.

- Last, but not the least, Internet commerce is in a technology-driven 'virtuous innovation cycle' of constant opportunity creation because of the very rapid progress of e-commerce technologies. Many technology start-ups as well as established companies such as IBM and Microsoft continually create fresh opportunities through new Internet and e-commerce technologies. These opportunities in turn attract even more entrepreneurs, further fuelling the virtuous cycle.

**Reasons for Using Internet**

Businesses use the Internet for almost as many reasons as there are businesses. The Internet is used by businesses for:

- Communication (internal and external)
- Corporate logistics
- Levelling the playing field
- Globalization
- Gaining and maintaining competitive advantage
- Cost containment
- Collaboration and development
- Information retrieval and utilization
- Marketing, PR, and sales
- Transmission of data
- Creating a corporate presence

Owing to all these benefits, E-Commerce is becoming a world of play today in the global marketing arena. It takes care of both the transaction parties – buyers as well as sellers.
1.7  Internet shopping therapy

Process in Electronic Commerce

For a transaction to happen between a buyer and seller, a certain process must occur. This process may involve the steps shown in Figure 1.7.1. Obviously, if the buyer is an organization or a repeat customer, some of the steps may be changed or eliminated.

Figure 1.7.1: How does an Electronic Market Work?

In this context, Chesher has postulated an Internet Shopping Therapy (Figure 1.7.2). Customer interest in e-commerce is driven by a belief that it offers lower prices and greater choice, that new products and services add greater convenience, and that customer service is improved via the ‘self-service’ model. The Web’s interactive capabilities, availability, and abundance of ‘live’ information give a buyer access to a wide range of goods and services and unprecedented control in a sales situation where there is virtually no pressure to purchase. As with most successful sales, it is necessary to reduce the consumer’s perception of risk and uncertainty. In this respect Web-based sales are no different from any other type of sale, but the novelty of the Internet for first-time users can only add to the underlying doubt that occurs to any buyer in a strange context. Removing this concern is important in making Internet shopping an enjoyable therapeutic experience, much the same way as shopping in the high street.

B2C e-commerce is very much about self-service where the customer is doing the buying and the e-tailer can only sell in a passive sense, through the design and creativity of their website. Having connected to the Internet the customer can

- Use a search engine to locate suitable websites
- Enter a Web portal that acts like a shopping mall and give access to a number of virtual shops.
- Go directly to a specific ‘book-marked’ website.

**Figure 1.7.2: Internet shopping therapy**

Once the required product is selected, it is placed in the virtual shopping basket and, if no further purchases are required, the customer proceeds to the ‘checkout’ process. With the purchase of a product completed the customer would then await delivery, possibly within a few days or less. The following study involving Land’s End provides a practical example of shopping therapy.

**Land’s End example**

Land’s End Inc. was founded in 1963 in Chicago, USA, selling sailboat hardware and equipment by catalogue. In 1975, it published its first full-colour catalogue with 30 pages of sailing equipment and two pages of clothing and from that point the proportion of clothing
sold grew steadily year by year. The company went public in 1986, and in 1988 reported sales revenues of USD 486 mn. In 1995 it established an Internet presence by launching www.landsend.com and in 1999 announced that the previous year's Internet sales grew threefold. Lands' End describes itself as a leading direct merchant of traditionally styled casual clothing for men and women, as well as soft luggage and products for the home. The company's products are offered through regular mailings of its catalogues and via the Internet. Customers shop directly by phone, mail, fax or the Web. Products are shipped from warehouses in North America and Europe direct to customers, wherever in the world they are.
1.8 Limitations of e-commerce

There was much hype surrounding the Internet and e-commerce over the last few years of the 20th century. Much of it promoted the Internet and e-commerce as the panacea for all ills, which raises the question, are there any limitations of e-commerce and the Internet?

Newton’s Third Law of Motion, ‘For every action there is an equal and opposite reaction’, suggests that e-commerce, for all its benefits, has limitations. These will be dealt with according to the three major stakeholders – organizations, consumers and society.

Limitations of e-commerce to organizations

Lack of sufficient security, reliability, standards and communication protocols. There are numerous reports of hacking of websites and databases, and security holes in software. For example, Microsoft over the years has issued many security notices and ‘patches’ for their software. Several banking and other business websites, including Barclays Bank, Powergen and even the Consumers’ Association in the UK, have experienced breaches in security where ‘a technical oversight’ or ‘a systems fault’ led to a leak of confidential client information.

Pressure to innovate

The pressure to innovate and develop business models to exploit new opportunities sometimes leads to strategies detrimental to the organization. The ease with which business models can be copied and emulated over the Internet increases this pressure and curtails longer-term competitive advantage.

Increased competition

Competition from both national and international competitors often leads to price wars and unsustainable losses for the organization.

Problems with compatibility between ‘older’ and ‘newer’ technology

There are problems where older business systems cannot communicate with web-based and Internet infrastructures, leading to some organizations running almost two independent systems that cannot share data. This often compels investing in new systems or infrastructure to bridge the different systems. In both cases this is costly as well as disruptive to the efficient running of organizations.
**Limitations of e-commerce to consumers**

**Need of computing equipment**
To participate in e-commerce through the new digital economy, customers must have computing equipment. This means an initial capital cost.

**Need of basic technical knowledge**
Similar to computing equipment, basic technical knowledge is required about navigating the Internet and the Web.

**Cost of access to the Internet**
The cost of access to the Internet sometimes poses a difficulty. For example, dial-up or broadband tariffs.

**Cost of computing equipment**
This involves not just the initial cost of buying equipment but also making sure that the technology is updated regularly to be compatible with the changing requirement of the Internet, websites and applications.

**Lack of security and privacy of personal data**
There is no real control of data on the Web or Internet. Data protection laws are not universal, so websites hosted in different countries may or may not be governed by laws to protect privacy of personal data.

**Direct contact and relationships are replaced by electronic processes**. Customers are unable to touch and feel goods sold on-line or gauge voices and reactions of human beings.

**Lack of trust**
There is a lack of trust because customers are interacting with faceless computers.

**Limitations of e-commerce to society**

**Breakdown in human interaction**
As people become more accustomed to interacting electronically, and begin to feel more comfortable interacting with a screen than face-to-face, there could be an erosion of personal and social skills which might eventually be detrimental to the world we live in.
Social division
There is a potential danger that there will be an increase in the social divide between technical haves and have-nots — so people who do not have technical skills become unable to secure better-paid jobs and could form an underclass with potentially dangerous implications for social stability.

Reliance on telecommunications infrastructure, power and IT skills
In developing countries, the reliance on telecommunications negates its benefits when power, advanced telecommunications infrastructures and IT skills are unavailable, scarce or underdeveloped.

Wasted resources
As new technology dates quickly, the disposal of old computers, keyboards, monitors, speakers and other hardware or software raises major issues of waste and environmental pollution.

Convenience of just-in-time manufacturing
This could cripple an economy in times of crisis as stocks are kept to a minimum and delivery patterns are based on pre-set levels of stock which last for days rather than weeks (see case study).

Difficulty in policing the Internet
Many crimes can be committed over the Internet and go undetected. The rise in availability of and access to obscene material, and the ease with which paedophiles and others can entrap children in chat rooms, are also causes for concern.

Paul Timmers\textsuperscript{102} highlights the hesitation among many companies about committing any major effort to e-commerce, for reasons summarized below: \textsuperscript{103}

- \textit{Lack of awareness} and understanding of the opportunities and implications and uncertainty about the appropriate \textit{business model}.
- Concern about \textit{total costs}, including retraining and telecommunications costs.
- Concerns about \textit{security} of sensitive data, such as credit card numbers, personal data and confidential business data.
• Concerns about *interoperability* and the risk that competition between major suppliers (e.g. Microsoft and Netscape) will lead to incompatible sets of standards.
• Uncertainty about *applicable law* and the appropriateness of the *legal framework*.
• Lack of *usability* of the technology, difficulties in performing slightly more complicated e-commerce than merely being present with a Web page.

Turban\textsuperscript{104} has grouped the limitations of EC into technical and non-technical limitations.

**Technical Limitations**
The technical limitations of EC are as follows:

- Lack of system security, reliability, standards, and some communication protocols (chapters 8, 11).
- Insufficient telecommunication bandwidth (chapter 11).
- Software development tools are still evolving and changing rapidly.
- Difficulty of integrating the Internet and EC software with some existing applications and databases
- Possibility of vendors needing special Web servers and other infrastructure, in addition to network servers
- Some EC software may be incompatible with some hardware, or with some operating systems or other components.

With the passage of time, these limitations will lessen or be overcome; appropriate planning can minimize their impact.

**Non-technical Limitations**
There are many non-technical limitations that inhibit the spread of EC. The most critical of these are as follows, according to a survey by Internet Week (1998)\textsuperscript{105}

- Cost and justification (34.8% of the respondents). The cost of developing EC in-house can be very high, and mistakes due to lack of experience may result in delays. There are many opportunities for outsourcing, but where and how to do it is not a simple issue. Furthermore, to justify the system one must deal with some intangible benefits (such as improved customer service and the value of advertisement), which are difficult to quantify (chapters 4 and 9).
Security and privacy (17.2%). These issues are important in the B2C area, especially security issues which are perceived to be more serious than they really are if appropriate encryption is used. Privacy measures are constantly improved, yet customers perceive these issues as being critical. The EC industry has a long and difficult task ahead, of convincing customers that online transactions and privacy are, in fact, very secure.

Lack of trust and user resistance (4.4 percent). Customers do not trust an unknown, faceless seller (sometimes not even ones who are known), paperless transactions, and electronic money. So switching from physical to virtual stores may be difficult.

Many legal issues are as yet unresolved, and government regulations and standards are not refined enough to address many of the circumstances that may arise.

E-commerce, as a discipline, is still evolving and changing rapidly. Many people are looking for it to stabilise before they venture into it.

There are not enough support services. For example, copyright clearance centres for EC transactions do not exist, and high-quality evaluators, or qualified EC tax experts, are rare.

In most applications, there are not as yet enough sellers and buyers for profitable EC operations.

E-commerce could result in a breakdown of human relationships.

Accessibility to the Internet is still expensive and/or inconvenient for many potential customers, though with Web TV, cellphone access, kiosks, and constant media attention, a critical mass should eventually develop.

Disadvantages of e-commerce also include 106

Credit card fraud
Credit card numbers can be stolen by a disgruntled or criminal employee who has legitimate or illegitimate access to the company's e-commerce system. Such an employee can either use the credit card numbers to purchase goods for themselves or sell the numbers to others.

Credit card theft is a great concern when doing business overseas. There is a much higher rate of stolen credit card number use overseas, particularly in Eastern Europe. 107 Developments in electronic signatures are likely to reduce fraud in e-commerce.
Products that don’t show well
There are items that are very difficult to sell effectively over the Internet. One example is diamonds. It is impossible to show the beauty of a diamond on the Internet. In instances like this, e-commerce may not be practical.

Limits to the market
Although the number of people on the Internet is increasing rapidly, not everyone has access to it. Stores such as Amazon.com, operating strictly on the Net, are missing the non-Internet user. Some people choose not to be on the net; others may not there because of geographic or governmental restrictions.

Small companies unprepared for global selling
Even though the smallest businesses can put up a website and engage in e-commerce around the globe, they may not have the experience or knowledge that worldwide trade requires.

Another problem with worldwide commerce is the variety of currencies. Most small companies are set up to handle only US dollars. The easiest way around the problem is to accept credit cards, since conversion rates and other hassles are handled by the credit card company. However, they need to be prepared for the possibility of fraud.

Finally, getting the product to the overseas customer may be a chore in itself. For a small company that sells a relatively small product, an international shipping company like DHL may be the easiest solution. These companies will deal with the logistical problems. Larger items may require other means of shipping.
1.9 Barriers and issues in e-commerce

What are the barriers to e-commerce?
Just as there are drivers of e-commerce, there are barriers to its growth and development. Several reports and surveys identify these, and many of them focus on security as being one of the largest inhibitors of and problems for e-commerce. To identify the barriers, CommerceNet (a non-profit consortium of business, technology, academic and government leaders who develop and implement e-commerce technology and business practices) conducts an annual time series survey of visitors to its website. Different nations are at different stages of development of e-commerce, and issues that are relevant to one nation may not be relevant to another. Similarly, issues perceived as relevant also differ by type of organization. For example, large organizations have different needs and infrastructures than SMEs. The study of 1,000 visitors divides the findings into the perspectives of three different types of organization — large B2B; B2B SMEs; and B-to-C retailers. The findings summarized in Figure 1.9.1 show that barriers to e-commerce can be seen as being relevant both to the macro- and the micro-environment levels of the firm. Overall, all the three organization types have similar barriers but with different emphases.

Internet infrastructure deals with issues such as availability and quality of the Internet in terms of speed and reliability. This is of particular concern to SMEs and B-to-C organizations, since their business relies more on general consumers, and the ease with which the general public can connect to the Internet has a direct impact on their Web-based business.

Technology infrastructure deals with issues of standardization of systems and applications. This is a particular concern for large organizations who want to implement solutions such as value chain integration and e-supply chain management.

Security in its broadest sense is one of the most significant barriers to e-commerce, both within the organization and outside it. Identified as Security and Encryption; Trust and Risk; User Authentication and Lack of Public Key Infrastructure; Fraud and Risk of Loss, it relates to the development of a broader security infrastructure and also relates to the kinds of measures organizations can take to improve security. Although security is a major concern for all types of organization, it is a dominant concern for companies in the B-to-C e-commerce retail sector, since it reflects the concerns and perceptions of users and potential customers that are conducting final transactions on-line.
The commercial infrastructure relates to issues such as international trade agreements, taxation laws and other legal agreements that facilitate all kinds of on-line trading and are a barrier relevant to all types of organizations.

At the level of the organization itself, many barriers to e-commerce relate to issues of organizational structure and culture. These are most significant for large organizations that have to deal with management of change. For example, there is a sense that much work still needs to be done to design the right organizational structure and corporate culture that will promote and maximize the benefits of widespread e-commerce applications. Additionally, there is a perception that business partners face similar organizational and technological problems, which raises the barrier further.

Another significant issue is the lack of qualified personnel to implement in-house and third party e-commerce systems. For SMEs, this is a particularly strong concern because internally they do not have sufficient resources to attract and maintain their own support staff to develop a sophisticated technology infrastructure. With regard to third parties, the qualified personnel tend to work for larger organizations, which are more concerned about serving lucrative larger clients than SMEs. One respondent noted that, 'small firms get lots of vague and general exhortations to go online but find it difficult to get reliable, well informed advice and honest, effective support from a web services provider'.

**Figure 1.9.1: Barriers to e-commerce**

Another major barrier to the development of e-commerce is a lack of proven business models. This is a reflection of the instability of the whole dot-com phenomenon, and the poor performance of the dot-coms on the world’s stock exchanges in late 1999 and early 2000 after the dizzy heights to which dot-com companies rose in 1998-9.

Interoperability of systems is identified as one of the major barriers for large US-based B2B corporations. This refers specifically to implementation and compatibility problems of integrating new e-commerce applications with existing legacy systems and resources within organizations. This problem also extends to interacting with systems of business partners and stakeholders. The fact that the USA is ahead in the adoption life cycle of e-commerce suggests that these issues will become more prevalent in other nations that are further behind in the life cycle. Thus, there is a need to introduce standards to overcome issues of incompatibility and interoperability. For SMEs that have fewer legacy systems, the issues are more a matter of interoperability with partner systems.

Many of the top barriers recognized by respondents in 2000 were also top concerns in 1999, especially security. This illustrates a consistency and reliability of the measures being taken by the survey. It also underlines the fact that they are not being addressed adequately.

Issues in e-commerce
Many surveys have been undertaken to find the inhibitors of EC, and most of them consistently place legal and related public policy issues at the top of the list. For example, according to the Georgia Tech 1997 and 1998 surveys (www.gvu.gatech.edu/user_surveys), the most important issues associated with the Internet were (in declining order of importance) censorship, privacy, navigation, taxation and encryption. The issues that have attracted attention of most of the surveys are discussed below:

Problems with trust building
In a survey conducted by Business Week and Harris Poll in the USA, 57% of Internet users surveyed said that their decision to buy on-line was influenced in favour of those websites which have a guaranteed security policy. Further, 50% of those polled believed that the government should pass laws addressing issues of security of personal data (Ferraro, 1998). Attempts have been made by governments in some countries to introduce a legal framework for e-commerce, but in most cases B2C e-commerce has relied on self-regulation. Business Week examined 100 top websites and discovered that only 43% posted privacy policies.
Another survey, done in early 2001 by Consumers International (Warren, 2001), found that while most sites collected personal information on consumers, fewer than two-thirds had a privacy policy. The policies that existed did not provide adequate protection for consumer privacy and could not explain how information on consumers was obtained and utilized. The consequences of such behaviour for the prospects of e-commerce has prompted many previous supporters of self-regulation to start advocating government intervention.

Another survey, done in late 1999 by the FBI and the Computer Security Institute in the USA of Fortune 500 companies, found that financial losses from computer crime went up by USD360 mn between 1997 and 1999 (KPMG, 2000). The figure is likely to be even higher if we take into consideration the fact that companies are normally reluctant to report losses resulting from breaches in security owing to the fear of negative publicity. Innovations in technology are pushing companies to introduce new systems so fast that many organizations neglect to adequately consider security. Unfortunately innovations that enable companies to introduce e-commerce are also available to criminals waiting to benefit from the easy availability of information.

The nature of security risks in e-commerce
Risks in security can be put into a number of categories:

- An attack on a company’s computer system by an outsider – the so called ‘hacking’ of computer systems – has become a common phenomenon on the Internet; in the year 2000, a virus called ‘I Love You’, which was sent as an email to on-line users worldwide, paralysed a large number of computer systems. The cost to businesses and governments was estimated at more than USD10 bn (KPMG, 2000). A more serious kind of hacking is by experienced programmers who, working either for themselves or on contract with firms, use their skill to gain access to a competitor’s information resources with an attempt to destroy, damage, block or steal information.

- An attack by a disgruntled or corrupt employee – The UK’s Computer Audit Commission report, published in 1994, has shown that only 15% of the total amount of computer abuse comes from external break-ins; the rest are rooted in the organizations. The situation has not changed much since then; about 80% of all security breaches are caused by a company’s own staff (Goodwin, 2000). High turnover of IT staff, dishonest IT staff, disgruntled employees who have left the company etc. have been stated as the main
factors. Damage could be done out of a sense of revenge, to make personal gain by manipulating information in the attacker's favour, or to profit from the sale of information to external bodies. Sometimes employees simply give outsiders the details necessary to gain access to a system, causing serious damage with little chance of anyone detecting the intrusion. There have also been many cases of a user introducing a ‘Trojan Horse’ – a programme that creates a dummy screen display for logging in; when other users try to use it the procedure results in writing their user ID to a file which is later used by the culprit to gain access. A similar approach can be taken to gain access to a customer’s online account in order to transfer money or exploit other facilities in e-commerce.

A large amount of data and equipment are damaged owing to inadequate physical safeguards against accidents such as fire, flood and power failures, incorrect data entry or an undiscovered error in a computer program owing to inadequate testing. Even after a number of well-publicised cases of theft and fraud, many companies fail to recognize the seriousness of the problem because (Bandyopadhyay, 2000):

- Managers are often not directly involved in the handling of data and therefore do not understand the risks.
- Many computer systems are left in the hands of a few technical people, giving a limited number of employees too much power over technology.
- The benefits of security measures are not tangible and therefore difficult to justify – especially to managers from non-technical backgrounds.
- One important feature of e-commerce is partnership and alliance, a relationship that relies on the widespread availability of information between partners. This can increase the vulnerability of an enterprise as the situation can be abused by some parties.

The use of pervasive computing – intelligent processors which are now embedded in ICT have the potential to create a ‘hyper-extended networked world’ (Ferraro, 1998) when connected to the Internet, enabling enterprises to collect data for mining and knowledge management. Although such practices contribute to the development of effective e-commerce, they also create the possibility of a society in which people are continually monitored and are forced to live under the threat of abuse of personal information.

Although risks exist in the physical world of business too, it is far easier to trace such events and take steps against them in this world than in cyberspace. Creating public trust in e-
commerce depends on the ability of organizations collectively to acknowledge the existing fears and engage in developing an infrastructure for the security and confidentiality of information.

**Privacy in e-commerce**

Privacy is one of the main issues users are concerned with when deciding whether or not to buy on-line. From a survey in the USA the Merchants Association found that only 5% of consumers visiting a website actually make a purchase, the primary reason being concerns over privacy and security (PWC, 1999). The same publication quoted an earlier survey carried out by Louis Harris and Associates and sponsored by PWC and Privacy and American Business, which concluded that

- A large majority (over 90%) of those buying on the Internet want to see notices posted on a website explaining how the personal information provided by customers buying on-line will be used by the company.
- A large majority of those who do not use the Internet yet said such notices would be very important if they were to go on-line.
- Of those who are not likely to use the Internet in the next year, 44% said that greater privacy assurance would be a major factor in convincing them to use.

At present public confidence in the ability of organizations to provide security and privacy in e-commerce is low. There have been many cases of complaints by consumers which forced businesses to amend their ways. For example, in 1997 a major on-line service provider was sued by customers on charges such as divulging information on individual sexual preferences, the navigational habits of customers etc. The service provider had to change its policies within 24 hours of this becoming public (PWC, 1999).

Customers are also suspicious of the reasons why organizations collect information. The customer relationship management (CRM), founded on the collection of data on customers (data warehousing and mining), is a major aspect of e-commerce. This has raised concerns about

- How much of the information collected is necessary
- Who is in charge of the information – the data subject, the user/holder (the organization which stores data), the service provider or the advertisers who use it to send marketing information.
- What are the rights of the above entities.
The basis on which the information is passed on to third parties, and whether the data holders have the right to do so.

Whether there is adequate self-regulation or government intervention is required

Whether a country's legal framework protects overseas online customers?

Failure to respond to these concerns is likely to seriously affect the growth in e-commerce; 'Privacy issues drive — or drag — the information economy' (PWC, 1999). In addition, the absence of some guidelines can cost companies dearly. The PWC report quoted the example of a case in 1998 when a federal jury in the USA awarded a victim USD 50,000 in actual damages and 4.47 mn in punitive damages against a credit-reporting agency (a company providing reports on individuals' credit records to businesses on request) that failed to follow reasonable procedures to maintain confidentiality. Business and governments need to take steps to alleviate such fears and create public confidence in e-commerce.

Phishing

Computer criminals now use a relatively new method — phishing, which is becoming more and more popular amongst hackers. Recently many banks all over the world encountered a variety of frauds and scams committed by hackers, swindlers, and their officials. But the most widespread crime against banks and especially account owners is the so-called 'phishing scam'. This scam always entails spam. Swindlers try to trick consumers into giving up credit card information by sending mail seemingly from regulations.gov, the government website where citizens comment on federal rule-making. These e-mails typically have subject headings such as 'Official information' or 'Urgent information to all credit card holders!' and claim that 'recent changes in the law require that Internet users identify themselves to the federal government to create a secure and safer Internet community.' Like other phishing scams, the e-mail includes a link to a bogus website, which in this case closely resembles regulations.gov. Once there, users are asked to enter private and personal financial information, including credit card numbers.

Phishing expeditions can be a financial windfall for attackers. Some analysts' estimates put the success rate of such bogus e-mails at about one in every twenty recipients. The most recent major outbreak of phishing attacks was between the summer of 2003 and January 2004, when Mimail and a host of copycats tried to trick users into giving up credit card information by masquerading as messages from PayPal, eBay, and other major companies and banks.
Copyright
In general, copyright provides an author with a tool to protect a work from being taken, used, and exploited by others without permission. The owner of a copyrighted work has the exclusive right to reproduce it, prepare derivative works based upon it, distribute copies by sale or other transfer of ownership, to perform and display it publicly, and to authorize others to do so. A copyright is infringed when one of the exclusive rights of the copyright holder is violated.

For a company that depends upon intellectual property for its livelihood, such as a software company or an Internet-based publisher, copyright law provides a framework to ensure that the company can compete in the marketplace. The importance of copyright is illustrated by comparing what happens to an appliance company when a refrigerator is stolen, with what happens to a software company when its source code is stolen. The refrigerator company will simply have one less item of merchandise to sell and a loss reflected by its price. The software company, however, will suddenly face the prospect of a market flooded with exact copies of its product – sold or given away by another. Without safeguards against unauthorized copying, sale and distribution of its product, the software company will not be able to survive.

Internet gambling
The Internet and other emerging technologies, such as interactive television, have made possible certain types of gambling that were not feasible a few years ago. For example, an Indian citizen can now, from his home at any hour of the day or night, participate in an interactive Internet poker game operated by a computer located in the Caribbean. Indeed, a tech-savvy gambler can route his bets through computers located in other countries throughout the world, thereby obscuring the fact that he is placing his bet from India.

Online gambling also makes it far more difficult to prevent minors from gambling. Gambling websites cannot look at their customers to assess their age and request photo identification as is possible in traditional physical casinos and off-track-betting parlours. Although some companies are developing software to try to detect whether a player is old enough to gamble or whether that player is from a legal jurisdiction, such software has not been perfected and would, of course, be subject to the same inadequacies as could be exploited by hackers.

Unlike on-site gambling, online gambling is readily available to all at all hours, and it permits the user to gamble, in many cases, anonymously. Unlike many other forms of gambling
activity, it is a solitary activity, which makes it even more dangerous; people can gamble uninterrupted and undetected for unlimited periods of time. Indeed, the problems associated with pathological and problem gamblers, a frighteningly large percentage of whom are young people, are well-established and can be measured in the ruined lives of both the gamblers themselves and their families.

Through slight alterations to the software, unscrupulous gambling businesses can manipulate the odds in their favour, make unauthorized credit card charges to the accounts of unsuspecting gamblers, or alter their own accounts to skim money. There is also a danger that hackers can manipulate the online games in their favour, or can steal credit card or other information about other gamblers using the site.

Another major concern about online gambling is that Internet gambling businesses provide criminals with an easy and excellent vehicle for money laundering, in large part due to the volume, speed, and international reach of Internet transactions and the offshore locations of most Internet gambling sites, as well as the fact that the industry itself is already cash-intensive.

Individuals wanting to launder ill-gotten gains through an online casino can do so in a variety of ways. For example, a customer could establish an account with a casino using illegally-derived proceeds, conduct a minimal amount of betting or engage in offsetting bets with an overseas confederate, and then request repayment from the casino, thereby providing a new "source" of funds. If a gambler wants to transfer money to an inside source in the casino, who may be located in another country, he can just play until he loses the requisite amount. Similarly, if an insider wants to transfer money to the gambler, perhaps as payment for some illicit activity, he can rig the game so the bettor wins.

The anonymous nature of the Internet and the use of encryption make it difficult to trace the transactions. The gambling business may also not maintain transaction records, in which case tracing may be impossible. While regulators in the United States can visit physical casinos, observe their operations, and examine their books and records to ensure compliance with regulations, this is far more difficult, if not impossible, with virtual casinos.
Threats to children

One of the greatest benefits of the Internet is that it provides children with access to such things as educational materials, subject matter experts, online friendships, and penpals. Nevertheless, like many other pursuits that children engage in without adequate parental supervision, the Internet should also be approached with careful consideration of risks and benefits. One concern of course is that the Internet may allow children unrestricted access to inappropriate materials. Such materials may contain sexually explicit images or descriptions, advocate hate or bigotry, contain graphic violence, or promote drug use or other illegal activities. In the worst instances, children have become victims of physical molestation and harassment by providing personal information about themselves over the Internet and making contact with strangers.

To protect children from such risks, parents and teachers need to empower themselves with the tools, knowledge, and resources to supervise and guide children's online experiences and to teach them how to use the Internet responsibly.

Ethical issues

Turban\textsuperscript{11} says ethics is a branch of philosophy that deals with what is considered to be right and wrong. Over the years, philosophers have proposed many ethical guidelines, yet what is unethical is not necessarily illegal. Thus, in many instances, an individual faced with an ethical decision is not considering whether or not to break the law.

The diversity of EC applications and the increased use of technology have created new ethical issues. An attempt to organize IT ethical issues into a framework was undertaken by Mason (1986) and Mason et al. (1995), who categorized ethical issues into privacy, accuracy, property and accessibility.

- **Privacy** – collection, storage, and dissemination of information about individuals.
- **Accuracy** – authenticity, fidelity and accuracy of information collected and processed.
- **Property** – ownership and values of information and intellectual property.
- **Accessibility** – right to access information and payment of fees to access it.

Representative questions and issues in each category are listed in Table 1.9.1. Mason et al. (1995) also developed a model for ethical judgement when an individual is faced with an ethical issue.
### Table 1.9.1. A framework for ethical issues

<table>
<thead>
<tr>
<th>Privacy</th>
<th>Accuracy</th>
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<tbody>
<tr>
<td>- What information about oneself should an individual be required to reveal to others?</td>
<td>- Who is responsible for the authenticity, fidelity, and accuracy of information collected?</td>
</tr>
<tr>
<td>- What kind of surveillance can an employer use on its employees?</td>
<td>- How can we ensure that information will be processed properly and presented accurately to users?</td>
</tr>
<tr>
<td>- What things can people keep to themselves and not be forced to reveal to others?</td>
<td>- How can we ensure that errors in databases, data transmissions, and data processing are accidental and not intentional?</td>
</tr>
<tr>
<td>- What information about individuals should be kept in databases, and how secure is the information there?</td>
<td>- Who is to be held accountable for errors in information, and how is the injured party compensated?</td>
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</table>

<table>
<thead>
<tr>
<th>Property</th>
<th>Accessibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Who owns the information?</td>
<td>- Who is allowed to access information?</td>
</tr>
<tr>
<td>- What are the just and fair prices for its exchange?</td>
<td>- How much should be charged for permitting access to information?</td>
</tr>
<tr>
<td>- How should one handle software piracy (copying copyrighted software)?</td>
<td>- How can access to computers be provided for employees with disabilities?</td>
</tr>
<tr>
<td>- Under what circumstances can one use proprietary databases?</td>
<td>- Who will be provided with equipment needed for accessing information?</td>
</tr>
<tr>
<td>- Can computers be used for private purposes?</td>
<td>- What information does a person or an organization have a right or a privilege to obtain – under what conditions and with what safeguards?</td>
</tr>
<tr>
<td>- How should experts who contribute to the creation of knowledge be compensated?</td>
<td></td>
</tr>
<tr>
<td>- How should access to information channels be allocated?</td>
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</tr>
</tbody>
</table>

Source: Compiled from Mason (1986) and Mason et. al. (1995).16

The Internet is rapidly transforming the way we communicate, educate and buy and sell goods and services. As its potential to provide unparalleled benefits to society continues to expand, however, there has been an increasing recognition that it can also serve as a powerful new tool for those who wish to commit unlawful and criminal acts. Considering these issues and their effects, it is certain that there are many more miles to go before the Net becomes the safest way to conduct business.
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