Chapter 1

"E-Commerce is certainly the buzzword of the future and imperative for Indian firms to become globally competitive"

- Phiroz Vandervala

E-COMMERCE AND ITS BUSINESS APPLICATIONS IN INDIA
Introduction to E-Commerce

As a fairly recently adopted term, E-Commerce is interpreted differently by different authors, experts and organizations. The present section (Section I of Chapter 1) of the study provides a comprehensive overview of the concept of e-commerce. This section begins with the explanation and overview of e-commerce, then defines e-commerce and describes how business organizations use this technology by explaining the various business models of e-commerce. In the end of section, concluding remarks are given.

The rapid growth of Information Technology (IT) has affected most parts of human society and its dominance over the other technology is clearly visible. One of the major application areas where information technology has greatly changed the traditions of the society is the way in which the business is being conducted. Businesses are weaving IT more deeply into the very tapestry of their operations and today, more and more business activities are shifting to the electronic media. The growth of electronic commerce1 (popularly known as E-Commerce) as a business technology in last decade is the result of such IT driven development, which is revolutionizing the business world. E-Commerce has produced a revolutionary new way for businesses to communicate and interact with the customers. It has power to expand the businesses beyond the global boundaries by giving them a competitive edge in the global marketplace. Businesses around the world are embracing this technology with great zeal as they realize the potential it offers. India is one of the countries where this trend seems to be catching on. Indian companies are fast jumping into the e-commerce boom, and adopting e-commerce as a business technology in much the same manner as in other parts of the world. The dawn of new era has already begun in India and the driving engine is information technology.

Conceptualizing E-Commerce

As a fairly recently adopted term, E-Commerce is interpreted differently by different experts and organizations. According to D.P. Mittal2, ‘Internet Commerce’ or ‘Electronic Commerce’ is the “exchange of goods or services for value on Internet”. Similarly, according to Satya Prasad3, the term ‘Electronic Commerce’ denotes “the use of Computer Networks to facilitate commercial transactions involving the production, sale and distribution of goods and services and intangible property”. In the words of

1 Electronic Commerce popularly called ‘E-Commerce’ is often used interchangeably with the IBM’s coined term ‘E-Business’. In reality, scope of e-business is much more than e-commerce. E-Business include not only e-commerce, but also used Internet based communications and Internet enabled business processes (for example, Enterprise Resource Planning, and Electronic Customer Relationship Management etc.), which might not be strictly commerce in the sense of buying and selling. In fact, e-business is a part of how you run your business and thus, e-commerce is just a subset of e-business.


The term ‘E-Commerce’ generally refers to “all forms of commercial transactions involving both organizations and individuals, that are based upon the electronic processing and transmission of data, including text, sound and visual image”. The World Trade Organization (WTO) defines E-Commerce as, “production, advertising, sale and distribution of products via electronic communication resources”. The Electronic Commerce Expert Group (ECEG) Report states, “electronic commerce is a broad concept that covers any commercial transaction that is effected via electronic means and would include such means as Facsimile, Telex, EDI (Electronic Data Interchange), Internet and Telephone” (Compbell, (1998)). In 1997, European Information Technology Observatory defined electronic commerce as “the carrying out of business activities that lead to an exchange of value across telecommunications networks” (Zwart, (1998)). The International Trade Administration defines the term ‘E-Commerce’ as: (i) any activity that utilizes some forms of electronic communication resources in inventory, exchange, advertisement, distribution and payment of goods and services; (ii) all forms of commercial transactions based upon the transmission of digitalized data, including texts, sounds and visualized images; and (iii) the commercial transactions of services in an electronic format. Electronic commerce is simply, the commercial transactions of services in an electronic format (Transatlantic Business Dialogue Electronic Commerce White Paper, 1997). Further, OECD defined electronic commerce as, “all forms of transactions relating to commercial activities, including both organizations and individuals, that are based upon the processing and transmission of digital data, including text, sound, and visual image. On the basis of above mentioned definitions and research, e-commerce can be understood as follow:

E-commerce is a generic term that describes the electronic mode of doing business with or without the help of Internet. The main objectives of e-commerce applications are boosting productivity, profitability, lower costs, increasing customer satisfaction and responsiveness. It uses a group of technologies with customers or other companies, to disseminate or gather business information, or to conduct business transactions. So, e-commerce is lot more than computer, Internet, software etc. In fact, it is a part of how you run your business. Thus, definition that is likely to be acceptable by people involved in electronic commerce can be as followed: The use of electronic communication resources (telex, facsimile, electronic mails, telephone, computer, EDI, etc.)

---

10 Compbell, (1998)
9 OECD (1997), Electronic Commerce Fundamentals: IBM.
10 E-Commerce is a broader concepts that covers all types of business and commercial transactions which are affected by electronic means whatsoever which, inter alia, includes Telephone, Telex, Facsimile, EDI, EFT, electronic mail, computers and Internet etc. But specifically it is with Internet because Internet is the most potent way or technique to perform business or commercial activities electronically. It is therefore; E-Commerce and Internet Commerce terms are used interchangeably.
E-Commerce Business Models

E-Commerce as a business model has emerged in the past few years as a result of growing popularity of Internet and development of World Wide Web. It has become a buzzword amongst electronic commerce academicians and business professionals and like many buzzwords though its’ meaning has become blurred with individuals attaching different meanings to it to suit their needs (Timmers, 1999). Rappa (2003) and Afuah and Tucci (2001) refer to business models as ‘methods’ by which firms do business. Timmers (1999) and Dubosson-Torbay et al (2002), refers to business models as ‘architectures’. whilst Krishnamurthy (2003) states that, ‘a business
model is a path to a company’s profitability”. Others (Gordijn et al (2000)\textsuperscript{23}; Weill and Vitale (2001)\textsuperscript{24}; Elliot (2002)\textsuperscript{25} and Hawkins (2002))\textsuperscript{26} refers to business models as descriptions or specifications. Further, Rayport and Jaworski (2001)\textsuperscript{27} add to the confusion in the preface of their book with the statement “while many believe that Internet Businesses don’t have business models, we strongly disagree”. This statement suggest the researcher that firms can choose whether or not to have a business models, however it is apparent even from the diverse terminology used by the different authors that a business models, be it a method, an architecture, a path, a specification or a description, exists for every firms; it is just a matter of articulating (Lamber, 2003)\textsuperscript{28} it. Kalakota and Whinston (1996)\textsuperscript{29} articulated e-commerce as being comprised of three relationship types: (i) those between enterprise and customer (B2C); (ii) those between and among customers (C2C) and (iii) those within enterprises (B2B). Thus e-commerce business models\textsuperscript{30} combine the traditional business infrastructure and electronic system to perform the business transactions and can be classified based on the type of business transactions. An e-commerce business models aims to use and leverage the unique qualities of Internet and world wide web\textsuperscript{31} (Timmers, 1998)\textsuperscript{32}. Broadly, e-commerce business models can be described into four categories.


\textsuperscript{29} It is no wonder that people of commerce quickly saw opportunities in using Internet to conduct business. The universality that the Internet offered had to be and was capacitated by businesses into universally accepted standards for storing, retrieving, formatting, and displaying information in a networked environment. This capacitated environment of the Internet is called World Wide Web (WWW) and premises businesses to get online and conduct a variety of business activities. Tim Berners Lee of European Laboratory for Particle Phyics was credited in 1990s with developing several protocols used in the initial development of WWW (Deithal, et al (2001), \textit{E-Business and E-Commerce: How to Program}, Upper Saddle River, New Jersey: Prentice Hall.

\textsuperscript{30} E-Commerce business models can be considered as a method of doing business, a method of generating revenues and profits and to sustain and prosper as a commercial enterprise.

\textsuperscript{31} Kalakota, Ravi and Whinston, B. Andrew (1999), \textit{Frontiers of Electronic Commerce}. New Delhi: Pearsons Education Pvt. Ltd.

Figure 1.1: Categories of E-Commerce Business Models

<table>
<thead>
<tr>
<th>Business</th>
<th>Customer</th>
</tr>
</thead>
<tbody>
<tr>
<td>B2B</td>
<td>B2C</td>
</tr>
<tr>
<td>C2B</td>
<td>C2C</td>
</tr>
</tbody>
</table>

1. Business to Business (B2B)
2. Business to Customer (B2C)
3. Customer to Business (C2B)
4. Customer to Customer (C2C)

**B2B Electronic Commerce:** Business-to-business electronic commerce facilitates inter-organizational interaction and transaction. This type of e-commerce requires two or more business entities interacting with each other directly, or through intermediary. The intermediary in the B2B e-commerce may be the market makers of and direct service providers, who assist in matching buyers and sellers and striking a deal (Bhaskar, 2003). The business application of B2B e-commerce can be utilized to facilitate almost all facets of interaction among organizations, such as purchasing and procurement, supplier management, inventory management and service and support. It can be supplier-centric, buyer-centric, or an intermediary-centric (Chakrabarti and Kardile, 2002). Today, it forms a major portion of total e-commerce volume. Value per transaction is high in B2B e-commerce when compared with other models. Today, B2B is the most popular model all over the world. In India B2B e-commerce is fast flourishing. Some of the most important players in India are: Maruti Udyog, Telco, Bajaj Auto, Kinetic etc. According to ICRA in ‘The Indian internet Business Report’, the B2B e-commerce turnover represents over 90 per cent of the total e-commerce activity in the country.

**B2C Electronic Commerce:** This model envisages a business organization contemplating commercial transactions directly with individual customers. Each transaction in B2C model represents an individual buying online e.g. amazon.com-Books and CDs, amul.com, products of Amul. The B2C business model also referred to as a

---

33 B2B e-commerce has, until recently, been undertaken solely via proprietary network, and usually referred to as EDI. Open networks and in particular Internet, are increasingly becoming the communication medium of choice for businesses, and the term EDI is likely to fall gradually into disuse.


35 One of the major beneficiaries of these transformations is cross-border inter-corporate trade, which constitutes a lion’s share of international trade for many companies in low-cost developing countries, like China and India as well as allows the buyers in developed countries to obtain their supplies from the cheaper sources.

virtual store. Virtual store is the business model that is used specially for B2C e-commerce transactions. For instance, once the customer places an order, the virtual store’s software can instruct its vendor or business organization to execute the order and operate on margins between buying and selling prices. It can be something like an online shopping mall (Sumanjeet 2003). Total worth of B2C e-commerce activities in India is expected to increase from Rs. 0.5 billion in financial year 2002 to Rs. 18.82 billion in 2005 (Datta, 2001). The B2C e-commerce opportunity has been utilized by three types of businesses: channel enhancement, the online Internet based stores, and small businesses trying to surpass entry barriers (Bhaskar, 2003).

C2B Electronic Commerce: Customer-to-business is the third common model for e-commerce. It involves customer relationship driven business in which faster feedback from the customer is the key for improvement of services and products offered by the company (Arora, 2000). In this type of electronic commerce customers get a choice of a wide variety of commodities and services, along with the opportunity to specify the range of prices they can afford or are willing to pay for a particular item, services or commodity. As a result, it reduces the bargaining time, increase the flexibility and create ease at the point of sale for both the merchant and customer. An example of C2B e-commerce could be the following. A student wants to fly from India to London, but has only 25,000 Rs. in the Bank to pay for this round trip. They put up an advertisement on an Internet C2B site, seeking airlines that are willing to offer the round trip for Rs 25,000 or less. The beauty of the Internet is that it brings together a large number of customers to create a marketplace that a number of airlines will be interested in.

C2C Electronic Commerce: It is a common platform where buyers and sellers meet. This model envisages business transactions being carried out between several individual customers who are often consumers. For example, someone who wants to buy used car and someone who wants to sell a used car can meet at C2C web store. This exchange can include third party involvement, as in the case of auction web site e-bay. In this category

---

37 The B2C model for e-commerce transaction is ideally suited for the following types of business:
1. goods can be easily transformed into digital format, such as books, music clips and videos and software packages.
2. items that follow standard specifications like printer ribbons, ink, cartridges etc.
3. relatively cheap items where saving outweigh risks.
4. highly rated branded items or items with return security: such as Dell and Compaq computers, electronic gadgets from Sony etc.
5. items sold in packets that can’t be opened even in physical stores, e.g. Kodak film rolls.
6. items that can be experienced online, such as music, videos etc.

38 Sumanjeet (2003), M.Phil Dissertation submitted on ‘E-Commerce’, to the Department of Commerce, M.D. University, Rohtak.
42 This is the approximate amount, in reality it may be more or less.
43 For example, those airlines will be more interested in the case where they will have to otherwise fly with empty seats.
electronic tools and infrastructure are employed to support transaction between individuals. Important differentiation is that no business organization is involved, e.g. automartindia.com- focusing on automobile, propertymartindia.com- focusing on real estate.\footnote{But, much of the transactions in this category correspond to small gift items, craft merchandise, and similar item that are normally sold through ‘flea’ markets or bazaars, where individual sell their goods to other individuals at the market determined price.}

In reality, e-commerce business models are not limited to these four. Many experts of this field (Wood, 2001\footnote{Wood, M. (2001), Guide to E-Commerce and E-Business, Upper Saddle River, New Jersey: Prentice Hall, pp. 1-6.}; Laudon & Laudon, 2002\footnote{Laudon, K.C and Laudon, J.P (2000), Management Information System, Upper Saddle River, New Jersey: Prentice Hall, p. 110.}; Balasubramaniam & Mahajan, 2001\footnote{Balasubramanian, S. and Mahajan, V. (2001), “The Economic Leverage of the Virtual Community”, International Journal of Electronic Commerce, Vol.5, No. 3, Spring, pp. 103-123.}; Bhatia, 2000\footnote{Bhatia, Varinder (2000), E-Commerce (Including E-Business), New Delhi: Khanna Book Publication Limited.}; Schinederjans & Cao, 2002\footnote{Schinederjans, J. and Cao, Marc (2002), E-Commerce Operation Management, Singapore: World Scientific, p.4.} and Lambert, 2002\footnote{Lambert, Susan (2001), A Review of Electronic Commerce Literature to Determine the Meaning of term ‘Business Models’, School of Commerce, Research Paper Series: 03-5.}) suggested that there are at least nine different categories of e-commerce. They included Government and its interaction with the various agents (i.e., Businesses, customers and Government) as a part of e-commerce activities and explained nine models. These are: (I) B2B \( (II) \) B2C \( (III) \) C2B \( (IV) \) C2C \( (V) \) G2B \( (VI) \) B2G \( (VII) \) G2C \( (VIII) \) C2G and \( (IX) \) G2G. They have rightly\footnote{This is especially true in the context of developing countries like India, where government acts as a regulator of many business activities. For example, India is only country where Venture Capital is regulated by the government. However, ideally government should not be in the business.} argued that government interacts with the people (customers) and organizations in many circumstances on the regular basis. For instance, in B2G organization allows businesses to fulfill government obligations on reporting their behaviour on such issue of taxes, environmentalism and legal action in a timely manner. All of the G2C, G2B and G2G organizations can share information required by the law and current legislation that might otherwise take years to convey. The governmental organizations allow for a much-needed expedience in the dissemination of information concerning the governance of people and assurance that law will be promptly obeyed. But, this form of interaction usually does not comes under the term ‘commercial transaction’, and directly does not help in producing revenue and if it is helpful indirectly it can not be measured in the term of money, which is also the most basic
condition for any transaction to called it ‘commercial’. However, where government acts as a buyer or seller, it comes under the business models and these transactions should be included under any of one above-mentioned four models.

Business Applications of E-Commerce Models

The growing debate on the importance and applications of various e-commerce models, raises a question in the mind that, why these models are gaining popularity over the brick-and-mortar business. Many studies have been conducted to find out the business applications of e-commerce models. Surprisingly, many of these studies (Jones, 1995; Haffman et al, 1995; Laudon & Laudon, 1999; Majumdar, 2000; Archer & Yuan, 2000; Khatibi et al, 2003; Poon & Swatman, 1999; Scott et al, 2001; Riquelme, 2001; Reibstein, 2002; Yulku, 2001; Brynjolfsson & Smith, 1999; Singla, 2004 etc.) revealed the same results and explained the major e-commerce business drivers are: reduced cycle time, reduced distribution costs, improved speed to market, enhance customer access, potential to target specific customers, better timeliness of services, low costs of operation, and improved product development. Added to these, targetability, flexibility and accessibility are found to be another major applications of e-commerce models that are not available thorough any other traditional media. Further, Ghosh (2001), explained three principle drivers of e-commerce operations: (1) the opportunity for new revenue streams through new services, products or business methods; (2) the potential to reduce the operating costs and (3) increased profitability as an outcome of the first two drivers. Murthy (2001), revealed that e-commerce is used in the service industries to lower costs, increase productivity, to deliver improved way of service, put more information in the hands of service representatives, personalize the service, collect data on customer needs, add value for the customers, differentiate the service and build relationships with customers. Building relationships through the web sites and Internet has become the ideal route for practicising the one-to-one marketing, especially for the B2B customers (Cunningham, 2001). In the same context, Schneider & Perry

\[\text{For instance, in the case of B2B e-commerce, B2B operations help in eliminating middleman from the process and also help in eliminating unnecessary inventory build up for both buyers and sellers.}\]
\[\text{Capital investment in e-commerce operations is considerably less than brick-and-mortar operations.}\]
\[\text{The online ability to keep track of products or services activities allows schedulers to be more accurate and timely in scheduling, and rescheduling product activity.}\]
stated that e-commerce technology enables relationship management to set prices, negotiate terms, product promotions, add product features, and customize its entire relationship with customers by obtaining detailed information about market behaviour, preferences, needs and buying patterns and different product uses. McGaughey (1999) revealed that B2C Model of e-commerce offers the potential to enrich customers. Using pictures, video, and audio, company personnel can literally show a product the customers and can explain how to use that or solve a problem, and explains things in much the same way that are done in the face-to-face interaction with customers. Bakos (2001) revealed that lower search costs in the digital markets make it easier for the buyers to find low costs sellers, and thus promote competition among the sellers. Schneider & Perry (2001) explained that, just as electronic commerce increase sales opportunities for seller, it increase purchase opportunities for buyer. Further, they explained that cost of handling sales enquiries, price quotes, and determining product availability can be reduced by using e-commerce in the sales support and order taking process of business.

Thus, e-commerce offers huge business opportunities, which are not available through the traditional form of business. In fact, applications of e-commerce models have become very important not only for the growth of business, but also for the survival in the liberalized, globalized and high-tech business world.

**Concluding Remarks**

From the above discussion it is concluded that e-commerce is more than accumulation of information and communication technology (ICT) applications related to miscellaneous business processes. In fact, it is a means of enabling and supporting any form of business/commercial transaction in which parties interact electronically rather than by physical exchange or direct physical contacts. It is modern concept of doing business electronically in the globalized business environment. Like traditional forms of commerce, there are variety of different types of e-commerce and many different ways to characterize these types. Table 1 lists the four major types of e-commerce. Among all, B2B is the most popular model (in the terms of total volume) of e-commerce. In fact, it is the oldest forms of e-commerce business models. B2C is the second most popular (in terms of total volume) and number one (in terms of number of transactions) forms of e-commerce business models. The B2B and B2C forms of e-commerce covers 95 per cent of global volume and C2B and C2C forms of e-commerce cover very insignificant 5 per cent of global commerce (Srivastava, 2002). Firms are interested in e-commerce because, quite simply, it can help increase profits. All the advantages of e-commerce can be summarized in one statement: e-commerce can reduce costs, increase sales and profits.

---

69 However, the contribution of B2C transaction is smaller than the B2B e-commerce.
These advantages are the principle drivers of e-commerce adoption in the modern business organizations. After studying the various definitions of e-commerce, it is also observed that concept of e-commerce in India is same as in other parts of the world and Indian business organization is using e-commerce as a business technology in much the same manner as in many other developing and developed countries. However, a developing country like India has its own harsh reality regarding the implications of e-commerce in India, and these aspects definitely have direct or indirect impact on the mind of individuals and organizations, thereby on the meaning of e-commerce. As far as concept of e-commerce is concerned researcher can conclude that, India is neither far behind from other countries nor advanced; we are fully able to understand this new business technology and able to keep pace with time and technology.
Electronic Commerce in India

The E-Commerce industry in India has come a long way since its early days. The present section (Section II of Chapter 1) of the study provides a comprehensive overview of emergence and growth of e-commerce in India. It has been studied in a very systematic manner. As e-commerce technology offers both opportunities and challenges, this section also brings in focus an overview of challenges of e-commerce in India. In the end of section, concluding remarks are given.

The cutting edge for business today is e-commerce. E-commerce is considered as one of the most exciting economic and technological trends of the recent years. It provides a new marketplace, more opportunities to sell and market the product, and greater competitive advantages (Ramachander, 2000)\(^1\). It creates value by vastly lowering the cost of transferring many types of information, on a one-to-one, one-to-many, or many-to-many basis. In cases where the product itself is information, the potential for value creation is enormous (Borenstein and Saloner, 2001)\(^2\). The effects of e-commerce are already appearing in all areas of business, from customer service to new product design. Offline “brick and mortar” firms around the world are just awakening to the opportunities from e-commerce, and are beginning their own online initiatives. Indian companies are also not lagging behind in this race and they are using e-commerce as a business technology in much the same manner as in the other parts of the world. And evidently, e-commerce has already proved its true potential in India (Rastogi, 2002)\(^4\).

Emergence of Electronic Commerce in India

In India, history of e-commerce is just a decade old. First initiative was taken by Ministry of Commerce in 1994, by setting up of EDI (Electronic Data Interchange Council) Council\(^5\). The EDI Council has promoted the introduction of EDI and e-commerce in the trade processes of various vital trading partners responsible for the regulation and facilitation of international trade. This has led to a significant reduction in processing time from earlier 30-45 days to between 6-24 hours (Arora and Banwat, 2003)\(^7\). But, a revolution came in the Indian history of e-commerce when VSNL (Videsh Sanchar Nigam Limited) launched India’s first dial up Internet access service\(^8\). In the

---


\(^3\) Brick-and-mortar term is used for traditional business operation that commonly deals with its customers face-to-face in an office or store that the business owns or rents (e.g. a retail store or a bank branch). Web based businesses usually have lower costs and greater flexibility than the brick-and-mortar operation.


\(^5\) EDI Council is the apex body with representation from several key government departments, and representatives of trade and industry.


\(^8\) The service was launched in six cities of India at Rs. 5000 for 250 hours and Rs. 45,500 for 250 hours for institutions (launch happened symbolically on Aug 14, 1995, on the eve of India’s Independence Day).
same year Yahoo was incorporated. In December, 1996 India’s first e-commerce site (arguably), nirulas.com was introduced. In the same year, rediff.com was founded by Ajit Balakrishnan. But, Internet and e-commerce age did not really down in India till 1997. In the end of 1997, shaddi.com was promoted by Anupam Mittal and family. In the same year naukri.com was founded. In November 1998, the government ended VSNL’s monopoly and allowed provisioning of Internet services by private operators. That December, India’s first cybercafe ‘netcafe@india was (a borough specific site, Koramangala can well be called the birthplace of Bangalore’s IT boom) was launched. Sify.com was also come into existence in the same year. 1999 and 2000 can be considered as a boom period for the Indian e-commerce or dotcom companies. During this period many Indian companies went online and many launched their website to play pure electronic game. Among them the most notable are: bharatmatrimony.com, e-bay.in, hungama.com, indiabulls.com, icicidirect.com, indiacar.com, indiagamer.com, indiamarkets.com, indiatimes.com, makemytrip.com, sharekhan.com, travljini.com, and kabadibazaar.com.

But a landmark came in the Indian history of e-commerce, when Indian Parliament passed the Information Technology Act, 2000 to boost e-commerce and e-governance. In the same year, India’s first private ISP gateway was opened and MSN first time launched an India specific portal msn.co.in. In 2001, Indian railway catering opened for online ticket booking and quickly becomes country’s largest e-commerce site. Today IRCT.co.in issues some 7000 tickets a day. In 2002, BPL mobile launched first

---

9 It is a matrimonial site, with physical network of ‘matrimonial centres’.
10 It is a job listing website. Its current business models are: product listing, response management and a resume database at several points ranging from Rs. 500 to Rs. 30 lakh.
11 For the first four years, VSNL was the sole provider of Internet service in the country.
12 It was promoted by Satyam and listed on NASDAQ. In the begining the company’s business models were: ISP, Portals, B2B/B2C e-commerce, e-learning corporate services and cybercafes. But now, they are: ISP (Corporate services largely, and hosting and Internet telephony), Cybercafes, and portal.
13 A matching site with 7.5 million members, presence in 24 countries.
14 Auction site, also provide platform for small companies to sell their products.
15 It is India’s first online advertising site, using digital interface, but supplementing that with a large physical presence in everygthing from advertising to loyalty programme management.
16 It is India’s leading stock broking company, went for an IPO in 2004. Its current business model are: Online and Offline brokerage real estate secured and unsecured lending.
17 Net based brokerage.
18 It works as an intermediary between the auto dealer and customer.
19 Online game site with an advertising based revenue model.
20 B2B market place.
21 It provides content driven advertising, e-commerce, auctions, ticketing travel, hotel bording, events, and mobile value added services.
22 A job site.
23 It is inbound, outbound, domestic travel agency. Largely inbound travel agency.
24 Online-offline Brokerage company founded in 2000. Over the last three years, the company has expanded its presence to about 300 outlets across 130 cities and offers products such as equity, equity derivatives, and, soon mutual funds. Sharekhan has 130,000 broking customers, and adds 7000-8000 per month.
25 B2C travel portal, booking origin complete holiday packages, travel loans and corporate events.
26 A site for second hand products.
27 For the record, IRCTC charges users between Rs. 40 and Rs. 60 for tickets booked online and its revenues of Rs. 10 crore come from this.
MMS service in Mumbai. Between 2001-02, several thousand Indian dot com companies died, because of low PC penetration and over lower Internet penetration. But, perhaps the biggest factor behind that crush was the lack of IT implementation strategy in the business. It was the reason during that period not many dot com emerged; however, it is the period, when Brick and Mortar business started the adoption of IT in their business operation.

By then, the net had changed everything. Indian companies are realizing the application of ICTs and Internet and using these technologies as a part of their business strategy. And, today almost every Indian company has web presence. In India, corporate like Hindustan Liver Limited (HLL) use e-commerce to unlock the inventory worth of Rs. 1,400 crore, which is generally stored by its 7,000 stockiest and over a million of retailers. Electrolux has introduced a web-based washing machine abroad. Amul sells its products to a customer base of 50,000 (in several cities) through the Internet. e-Bay India (formerly bazee.com) is our country’s largest online trading community. Around 1.7 million registered users spread across 240 towns and cities trade in around 2500 categories of products, ranging from apparel, arts, antique, books, cars, computers and electronics, to health and beauty products. On any day there are at least 100,000 live listings, with close to 3000 new ones added every day28 (Gopalakrishnan, 2006)29.

These are just the few examples; in fact many Indian companies30 from different segment are using e-commerce to sell their products and services. Most revenue from e-commerce transactions are generated by B2B, followed by B2C.

---

28 Today, on a normal day, e-Bay India sold:
- A piece of jewellery is sold every 5 minutes
- A mobile handset is sold every 8 minutes
- A watch is sold every 15 minutes
- An air ticket is sold every 25 minutes
- An MP3 player is sold every 31 minutes
- A piece of women’s apparel is sold every 43 minutes
- A digital camera is sold every 50 minutes
- A book is sold every 52 minutes
- A laptop is sold every 70 minutes
- A car part or accessory is sold every 71 minutes
- A VCD is sold every 106 minutes
- A PDA is sold every 114 minutes
- A motorcycle is traded every 8 hours
- A car is sold every 9 hours

30 In the year 2005, PCQuest conducted a survey of Indian companies using ICT in their operation. Some of the best company according to survey were:
- IRCTC; Wockhardt Hospital; ICICI Lombard; NSE India; Timex Watches; International Business Division, ITC; Pfizer Limited, India; PNB; Reliance Infocomm; Titan Industries; Fortis Healthcare; HDFC Bank; Infosys Technologies; JK Industries Limited; Mahindra and Mahindra; Apollo Tyres; Tally Solution Pvt. Limited; LG Electronic India Limited; SBI and Indian Oil Corporation.
Growth of E-Commerce in India

E-commerce offers great potential and opportunities for businesses. Besides providing access to new and bigger markets, e-commerce helps to bring about reduced costs and faster turnaround by streamlining and integrating processes among the entire business value chain (Economic and Social Council, 2002). In India companies from various segments have actively prompted Internet usage and e-commerce applications. Such efforts, facilitated by an advanced infrastructure with widespread broadband access, have given rise to a proliferation of Internet and e-commerce applications. Those applications have enhanced the adoption of e-commerce as a mode of business transaction and made it an integral part of competitive business strategy. In India most of the e-commerce transactions are limited to B2B and B2C; C2C model of e-commerce is not very popular in India.

B2B E-Commerce in India: the increasing complexity of supply networks, the globalization of businesses, the proliferation of product variety, and shortening the product life cycles are forcing the Indian companies to draft B2B e-commerce strategy. The B2B business model refers to new ways of doing business in a supply chain such as e-auction, e-exchange and e-markets (Sawhney and Kaul, 2001). B2B is the most popular model of e-commerce all over the world. Reports from commercial research and consulting organizations, such as Gartner Group and Boston Consulting Group, continue to indicate that although the volume B2C transactions is higher than that of B2B transactions, the total volume of B2B sector far exceeds that of B2C by about 10 to 1 (Tassabehji, 2003). Reports also indicates that B2B over the web is growing and continues to grow and that the total worldwide value of goods and services purchased by business through e-commerce solution will increase from US$282 billion in 2000 to US$4.3 trillion by 2005-a compound annual growth rate of 73 per cent according to Indian government has also taken number of initiative to boost e-commerce in India. Some of the most important initiatives are: government of India provides financial assistance for setting up electronic commerce laboratory, the government has also made amendments to the tax laws to provide tax benefits, most notable among them are: (1) tax holidays for units engaged in rendering IT enabled services (2) tax holidays for units providing Internet and broadband network services and tax holidays for setting up SEZ. Also allowed 100 FDI to B2B e-commerce. The immediate agenda for the government of India now to enact Cyber and Convergence Laws, amending tax legislation and provide for legislation granting protection to IPRs in the electronic commerce age.

31 Indian government has also taken number of initiative to boost e-commerce in India. Some of the most important initiatives are: government of India provides financial assistance for setting up electronic commerce laboratory, the government has also made amendments to the tax laws to provide tax benefits, most notable among them are: (1) tax holidays for units engaged in rendering IT enabled services (2) tax holidays for units providing Internet and broadband network services and tax holidays for setting up SEZ. Also allowed 100 FDI to B2B e-commerce. The immediate agenda for the government of India now to enact Cyber and Convergence Laws, amending tax legislation and provide for legislation granting protection to IPRs in the electronic commerce age.


33 For instance, the four big players –Naukri, Indiatimes, Rediff and Sify- are getting ready to list on the public markets this year or, at most the, next year.

34 This statement can be supported by the fact that no data is available on C2C in India.

35 Effective use of B2B e-commerce systems for managing operating resources can reduce the costs, decrease cycle time, and hence increase profitability.

36 The information technology that supports the B2B e-commerce can be classified in two layers: Network Layers and Application System Layer. The network layer technology includes Value Added Network (VAN), Extranet and Virtual Private Networks (VPN). The application system layer technology is Electronic Data Interchange (EDI), Extended Enterprise Resources Planning Systems (ERP) and Supply Chain Management (SCM).


International Data Corporation\textsuperscript{39}. B2B e-commerce projections are rising dramatically worldwide as well as in India as more and more companies are integrating enterprise systems (ERP) to customers and suppliers systems\textsuperscript{40}. Various Indian companies\textsuperscript{41} such as Maruti Udyog, Hindustan Lever Limited, Bajaj Auto, Hero Honda, ONGC, TISCO, Reliance, TVS, Wipro, Telcom, IOCL, Mahindra and Mahindra, L&T, Hindustan Motors and Godrej are using B2B in their business operation. Some popular Indian based B2B sites are: rediff.com, indiatimes.com, jobstreet.com and indiamarkets.com. Thus, B2B e-commerce has registered rapid growth in India within few years. Table 1.1 indicates the growth of B2B e-commerce in India.

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue (in Crores)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998-1999</td>
<td>119</td>
</tr>
<tr>
<td>1999-2000</td>
<td>400</td>
</tr>
<tr>
<td>2000-2001</td>
<td>3,200</td>
</tr>
<tr>
<td>2001-2002</td>
<td>13,200</td>
</tr>
</tbody>
</table>

Source: Nasscom

However, B2B in the past few years was limited to the Indian buying sites of the other countries, which denotes the outflow of cash. The high cost associated with implementation of EDI has been one of the major barriers for poor adoption of e-commerce by the Indian corporate, particularly SMEs (Jaiswal)\textsuperscript{42}. But, there is significant change in the attitude of Indian business from the previous years to present stage (Sumanjeet, 2004)\textsuperscript{43}. The Indian business communities now a day are alert and on the quick look out to note anything, which slashes lead-time and costs all round and maximize profits. Recent studies show that B2B transactions will dominate and will be the primary growth engine over the next 3 to 5 years\textsuperscript{44} (Arora, 2000)\textsuperscript{45}. Further the Nasscom and Boston Consulting Group projected that B2B transactions in 2005 in India will be of Rs 1, 92,000 crores (Nasscom)\textsuperscript{46}.


\textsuperscript{40} ERP systems are being implemented by almost all the large private as well as the public sector enterprises. Very few corporates have been able to extend ERP systems for B2B e-commerce. The most promising technology for B2B e-commerce in India seems to be MIME (Multiple Internet Mail Extension) based EDI over Internet. This technology is not cost effective but has more reach. The Application Service Providers for outsourcing Information Technology and Systems will emerge as models for B2B e-commerce transactions for the small and medium enterprises.

\textsuperscript{41} These are just the name of few companies, in fact most of the large scale organizations and particularly MNCs are using B2B model in their operation. Among all the players probably, the biggest ‘internal B2B’ players is Maruti.

\textsuperscript{42} Jaiswalm M.P. cited in Sawhney and Haul, (2001)


\textsuperscript{44} Government of India allowed 100 per cent FDI to B2B e-commerce.

\textsuperscript{45} Arora, K. Karunesh (2000), \textit{“E-Commerce: Business through the Internet”}, Science Reporter, October.

\textsuperscript{46} www.nasscom.org
B2C E-Commerce in India: the Internet allows easy, direct communication with a group of customers or individual customers (Chesney, 2002; Yelkur, 2001). The website itself can be customized for the groups or individuals (Hardings et al., 2001). This allows businesses to target the specific markets. Some of the first examples of B2C e-commerce were amazon.com and dell.com in the USA and lostminute.com in the UK (Tassabehji, 2003). Today B2C is the second most popular model of e-commerce followed by B2B.

The way shopping was done in India has seen changing trends. About 12 years ago Burlingtons brought catalogue shopping to India. The colorful catalogue did attract certain shoppers but then they suddenly disappeared. It was then the turn of TV shopping which slowly is giving way to Internet shopping. In western countries, 39 per cent of those with access to Internet say they shop to the store or mall less often, now that they can easily shop for product or service online. B2C model of e-commerce is not very popular in many countries, among the countries where it is popular, America and UK is leading.

As Internet users are growing in India very rapidly, it is expected to become a major sales channel in India. But, the present situation is far below the level of satisfaction. Cultural factors and the current convenience of offline retailing are the key factors that limit online sales in India (Sethi, 2002). There are also many other reasons behind the poor growth of B2C e-commerce in India (Table 1.2). Some of the most important are: low awareness of using IT and IT enabled services among customers; poor Internet penetration and psychological barriers (Sumanjeet, 2004). Table 1.2 indicates the growth of B2C E-Commerce in India.

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue (in Crores)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998-1999</td>
<td>12</td>
</tr>
<tr>
<td>1999-2000</td>
<td>50</td>
</tr>
<tr>
<td>2000-2001</td>
<td>300</td>
</tr>
<tr>
<td>2001-2002</td>
<td>1,800</td>
</tr>
</tbody>
</table>

Source: Nasscom

50 Tassabehji, 2003
51 this year (2006, in the holiday season) about 33 per cent of American households made an online purchase, up an estimated 10 per cent from a year earlier. Sales of music albums in US fell about 7 per cent in the year 2005, even as the online purchase more than doubled over the last year, a mixed bag for the recording industry but little encouragement for embattled retailers.
52 Sethi, J.S. (2002), "Entrepreneurship and Innovation in the Knowledge based Economy: Challenges and Strategies, Asian Productivity Organization, Tokyo, Japan
In the near future, B2C e-commerce is expected to play a significant role in the growth of e-commerce in India. The horizontals (think indiainfo.com; indiya.com, 123india.com) wanted to sell everything from books to holiday packages. Easybuymusic wanted to sell digital music downloads; Jaldi wanted to aggregate demand and offer consumers hefty discounts. Table 1.3 indicates the success story of Indian dot com companies.

### Table 1.3: The Unfolding Story of Indian Dotcoms

<table>
<thead>
<tr>
<th>Internet Industry Snapshot</th>
<th>Retail (Crore)</th>
<th>Jobs</th>
<th>Matrimonial / Dating</th>
<th>Travel &amp; Ticketing</th>
<th>Advertising</th>
<th>Broking</th>
<th>B2B Marketplace</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (Crore)</td>
<td>150</td>
<td>135</td>
<td>40</td>
<td>750</td>
<td>162</td>
<td>500</td>
<td>180</td>
</tr>
<tr>
<td>Last Year’s Growth</td>
<td>25</td>
<td>35</td>
<td>35</td>
<td>100</td>
<td>60</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Current Leaders</td>
<td>Rediff, Indiatimes and e-bay</td>
<td>Naukri, Monster, Jobstreet, Timesjobs</td>
<td>Shaddi, Bharatmatrimony, Timesmatri, Jeevansaathi</td>
<td>Makemytrip, Indiatimes, Traveljini, Indian Railways, Air Deccan</td>
<td>Rediff, Indiatimes, Google, Yahoo, Moneycontrol and NDTV</td>
<td>Indiabulls, ICICI Direct, Kotak Securities and 5 Paisa</td>
<td>Metaljunction Agriwatch, Indiamart, Tradeindia</td>
</tr>
</tbody>
</table>

Note: 1. All figures are estimated for 2005-06.
2. Broking figures are the commission earned by the online areas of the broking firms.
3. B2B does not include the e-procurement sites.
4. Retails and travel figures are in billings.
5. Advertising figures are revenue.

Source: BW estimates, eStatsIndia.com and Industry Sources; compiled by Researcher.

The three current e-commerce leaders, indiatimes, Rediff and eBay-focus on the ‘Internet Friendly’ categories like apparel, electronics and jewellery. Not only dotcom companies, but also the traditional companies are using e-commerce for selling their goods and services online to their customers. Telecom services, consumer electronics, Travel, Automotive products and Financial services will be the important categories in the coming few years. Predicting the bright future of B2C e-commerce in India, Nasscom, Boston Consulting Group projected that B2C transactions will cross Rs 3,000 crore in the year 2005. But in actual, the total value of e-commerce activities within India crossed Rs 570 crore during 2004-05, according to a research conducted by Internet and Online Association of India (IOAI) a non-profit industry organization. Further, the report estimates growth in excess of 300 per cent during the next couple of years and says Rs 2,300 crore worth of B2C transactions will be conducted within the country by the year 2006-07.

### E-Commerce in the Indian Financial Services

In addition to B2B and B2C e-commerce, Indian companies are also positioning themselves as e-service companies. The Internet has come up with the many channels for services delivery, offered like never before convenience to the customers (Dhamija, 2004). But, nowhere else the impact of Internet felt as much as on the financial services. E-Broking is the financial service most amenable to the e-enablement (Goswami, 2004).

---

Today more than 35 per cent of transactions made by the US retail investors are done through Internet, in UK it is 20 per cent and in the South Korea it is of 40 per cent.

In India, online stock trading was started in 1st April 2000. Geojit Securities was the first to go online. NSE was the first stock exchange to do so in India. Presently there are around 80 online brokerage companies in India with ICICI Direct, 5Paisa, Indiabulls, Motilal Oswal, Kotak Stree, Elite Securities and Investsmart India being some major players. Table 1.4 indicates the present status of online stock trading in India.

Table 1.4: Status of Online Stock Trading in India

<table>
<thead>
<tr>
<th>Years</th>
<th>Enabled Members</th>
<th>Registered Clients</th>
<th>Trading Volume (in rores)</th>
<th>% of Total Trading Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999-00</td>
<td>3</td>
<td>1,23,578</td>
<td>7,287.81</td>
<td>0.54</td>
</tr>
<tr>
<td>2000-01</td>
<td>61</td>
<td>2,31,899</td>
<td>8,138.81</td>
<td>1.59</td>
</tr>
<tr>
<td>2001-02</td>
<td>82</td>
<td>3,46,420</td>
<td>15,360.76</td>
<td>2.48</td>
</tr>
<tr>
<td>2002-03</td>
<td>70</td>
<td>4,63,560</td>
<td>37,945.08</td>
<td>3.45</td>
</tr>
<tr>
<td>2003-04</td>
<td>78</td>
<td>8,49,696</td>
<td>81,033.81</td>
<td>7.11</td>
</tr>
<tr>
<td>2004-05</td>
<td>78</td>
<td>8,49,696</td>
<td>81,033.81</td>
<td>7.11</td>
</tr>
</tbody>
</table>

Source: Indian Express, July 9, 2005

Table 1.4 indicates that the present level of online stock trading is not satisfactory if we compared this situation with other countries; however, online stock trading has registered very rapid growth in India. It is also expected that as the Indian stock market is breaking records these days it will also help in increasing the number of online investors. According to Motilal Oswal Shukla, the lack of confidence in the online model has prevented the online trading from taking off in India. Our legal system is still very archaic for the development of this new form of electronic stock trading (Sumanjeet, 2005). Inspite of these problems of future of online stock trading looking very bright in India (Sisodiya, 2003; Chauhan, 2001; Sumanjeet, 2005; Goswami, 2003).

Apart from buying and selling of goods and services, Internet is highly used for the customer services and other front desk services in the modern organizations. After the great success of Call Centers and Medical Transcription, BPO (Business Process Outsourcing) and KPO (Knowledge Process Outsourcing) have registered a very rapid growth.

56 On 1st February 2000, the National Stock Exchange opened up the Internet based trading system for its members.
62 It is important to note that these services can not be covered under the present study as they do not come under the any model of electronic commerce. In fact, it is a part of e-Business strategy. Thus, studying these are out of the scope and researcher have to limit his study up to the model of B2B, and B2C.
growth in India. In the year 2002-03 the growth of BPO sector was accounted 70 per cent. India is still regarded as the number one destination for offshore services and is expected to be the leader in the years to come. According to Nasscom, Indian BPOs are poised to grow by 45.6 per cent from $ 5.7 billion to $ 8.3 billion in year 2005-06. Table 1.5 indicates the revenue and growth trajectory of Indian BPOs.

Table 1.5: Revenue and Growth Trajectory of Indian BPOs

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue ($ billion)</th>
<th>Growth %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-03</td>
<td>2.7</td>
<td>---------</td>
</tr>
<tr>
<td>2003-04</td>
<td>3.9</td>
<td>44.1</td>
</tr>
<tr>
<td>2004-05</td>
<td>5.7*</td>
<td>46.1</td>
</tr>
<tr>
<td>2005-06</td>
<td>8.3**</td>
<td>45.6.</td>
</tr>
</tbody>
</table>

Source: Nasscom
*Estimated; **Projected

Such predictions are based on its low cost huge pool of skilled workers, the English language advantage and the maturity and scale of the BPO providers. However, the Indian BPO industry has started losing its attraction due to the commoditization of voice based services. Increasing cost and discontent among clients regarding the quality of services is forcing them to look for other option.

Another area of Indian Industry where they are performing exceptionally is the software services (Harila and Joseph, 2001). Today Indian software industry appears to be unique when compared with the experience of most other Indian exports. More importantly, in 1998-99 more than 203 out of the Fortune 1000 companies outsourced their software requirement from India. The IT software industry has emerged as the biggest contributors towards the India’s exports with a share of 16.5 per cent in 2001-02. It is expected that by the year 2008, this industry would account for 35 per cent of the country’s exports and 7.7 per cent of the GDP.

Challenges in Implementation of E-Commerce in India

Isaac Newton’s 3rd Law of Motion, ‘for every action there is an equal and opposite reaction’ suggests that for all the opportunities there are challenges to e-commerce (Tassabehji, 2003). In India, e-commerce offers significant opportunity for the growth and development of Indian firms, but also represents tremendous challenges in its successful implementations. Therefore, despite the island of excellence, e-commerce has not been able to make the expected growth in India. Many studies reveal that not many Indian companies are able to reap the benefits of e-commerce at the fullest because of these challenges. These challenges are more herculean in developing countries like India, where computing itself is taking roots gradually. For instance, one of the challenges in the development of e-commerce in India is the lack of proper commercial and legal system for conducting the business and

---

commerce though the electronic means (Kaul and Singh, 2000). There are many other challenges faced by Indian companies in the successful implementation of e-commerce. Added to this, many other challenges like economic, social, psychological, technological are faced by the Indian customers. Systematically these challenges can be divided into four broad categories. These are: infrastructural challenges, social and economic problems, organizational challenges and challenges faced and posed by Indian customers. 

**Infrastructure Challenges:** India’s e-commerce infrastructure is very poor in comparison to many developing and developed countries. Some of the infrastructural challenges for the growth and development of e-commerce in India are: low rate of personal computers, low rate of Internet subscribers and users, high access cost of Internet, poor bandwidth status, lack of sufficient system security, reliability, standards and communication protocols (Arora, 2006) and poor legal system.

**Economic and Social Problems:** India is a developing country. Its social and economic status in not very favorable for growth and development of e-commerce. There are many social and economic problems, which are hampering the growth of e-commerce in India. These are: poverty, poor literacy rate, language problems over the Internet, political problems, ethical and cultural problems and lack of understanding of new technologies like e-commerce.

**Challenges before the Indian Organizations:** There are number of problems which Indian organizations are facing with the implementation of e-commerce in their businesses. Some of the most important are: Indian companies are still not convinced of financial and business benefits of e-commerce, lack of knowledge and understanding of e-commerce, 

---

66 A good example can be the issue of Domain Names. Recently many Indian companies have faced the problems as cybersquatters hijacked their trademarks as domain name. In a recent case, the trademark of 'tanishq' was registered by a Tata Group of Company, Titan Industries. A cybersquatter hijacked the domain name of tanishq.com.


69 For details, Section II of chapter 1 ‘E-Commerce Infrastructure in India’.

70 There are numerous reports of websites and databases being hacked into, and security holes in software. In India, it is roughly estimated that the cyber crime witnessed an increase of about 40-50 per cent in 2005.


72 See details, Section III of chapter 1 ‘Legal Infrastructure for E-Commerce in India’.

73 In India, there are about 300 million people in India, who are below poverty line. They can not even think about the use of latest technologies.

74 Illiteracy is also big challenges in the growth of new technology like e-commerce, as illiterate people are not expected to use the Internet. The Literacy rate in the country had increased from 18.33% in 1951 to 65.38% in 2001.Thus in five decades, the literacy percentage had grown by 47.05% or by an average of 9.41% per decade. According to the 2001 Census, male literacy was 75.85% and female literacy 54.16%. The number of non-literate people in the 7+ age group was 296.21 million. The number of literate persons in the 7+ age group was 562 million. This was more than the total population of USA (267.11 million).

75 Most of the websites are in English, but English is not the first language of the country. As a first language only 178,598 people use English. However as overall usage India is number one in the world, as it has more than 350,000,000 (Source: http://www.answers.com/topic/list-of-countries-by-english-speaking-population)

76 In developing countries like India, culture is considered invaluable and adaptation to the local needs and conditions represents a key element in the successful implementation of e-commerce.
not enough customers have Internet access, security and privacy problems, high set up cost of e-commerce system in India, psychological fear of IT, mindset shift in using e-commerce and keeping up pace with the changing technologies.

*Problems faced by Customers:* Indian customers have different psychology regarding the buying and selling of goods and services. For instance, bargaining. Therefore, there are number of problems faced by Indian customers when they buy through Internet. Among them, the most important are: bargaining does not carry forward to net shopping, which dissuades most Indian customers, Indian customers do not feel safe about electronic payment, mindset shift in using e-commerce, lack of understanding, how to transact though net, Indian customers do not enjoy shopping over the internet as for most of the customers shopping is status symbol.

Added to these reasons, according to the Survey of IDC, India\textsuperscript{77}: 44 per cent users are more comfortable with traditional way of shopping, 33 per cent customers do not believe that goods will reach in time, 42 per cent of them are not sure about the quality of goods delivered, 37 per cent think that enough goods and services are not available on the net and 35 per cent think ordering though net is too slow.

Thus in India, there are number of challenges in the growth of e-commerce and its successful implementation. Therefore there is strong need to tackle these issues and challenges for the growth and implantation of e-commerce in India.

---

**Concluding Remarks:**

The E-Commerce industry in India has come a long way since its early days. Five years ago, ISPs has just taken off. There was no usage, no broadband, no content and no perfect laws for regulating the e-commerce transactions. Not only Indian customers, but also Indian business organizations were unaware of the advantages of transactions made though e-commerce. But, now the picture has totally changed. We were at 38.5 million users (54 per cent growth in last year) in June 2005, according to Internet and Mobile Association of India. It offers huge opportunities and today Internet has become a part of our daily life. Indian organizations are also realizing the potential of e-commerce and using e-commerce technologies in their day-to-day business operations. Now Indian market has matured and new market players have entered the market space. In India, companies from various segments have actively prompted Internet usage and e-commerce application. B2B e-commerce in India has registered a very rapid growth in India within few years. This market is reinventing new business models and has already begun to offer end-to-end e-commerce platform for the entire buy cycle to business users. At the same time end users are also forcing vendors to expand their service mix and to adopt new business models. The growth of B2C is comparatively slow than the growth of B2B Model of e-commerce. But, this is not to say that B2C e-commerce scenario has been bad in India as heavily successful players like e-bay, indiatimes, naukri, shaddi, makemytrip, rediff, yahoo, indiabulls, ICICI Direct and Indiamart has already proved their potential. Growth in IT enabled sector like online stock trading, online advertisings and BPO has

\textsuperscript{77} This survey was based on the opinion of 180 respondents.
been remarkable. Thus, e-commerce offers huge opportunities for Indian firms to grow and generate more revenue. But, certain technical, legal, socio-economic and psychological constraints are impending its growth in India. Perhaps the biggest challenge is the poor legal and telecommunication infrastructure. However, government of India has taken number of measure to boost e-commerce in India. But, still there are many issues and challenges like e-taxation, privacy, low rate of Internet users, IPRs, consumer protection which are need to resolve. As far as, the future of e-commerce in India is concern, it does look bright; as more and more customer and companies are shifting to the electronic media. But at this point of time, it is really difficult to predict exactly, if not impossible. The forces that determine the web’s winner and losers are just taking shape and technological advances could add ever more uncertainty.
Section III

E-Commerce Infrastructure in India

Infrastructure is known as backbone of any economic and social system. It is necessary not only for the survival, but also for the growth. Therefore, E-Commerce infrastructure is needed not only to support e-commerce transactions; but also to realize the potential exists in the market. This section mainly aims to study the present status of e-commerce infrastructure in India. In this section, an attempt has been made to study technological, telecommunication and legal infrastructure of e-commerce in India. In the end of section, concluding remarks are given.

The utility and benefits of e-commerce are well known (Patil and Shyamasunder, 2005). E-commerce has changed the face of most business functions in competitive enterprises. It has seamlessly automated interface processes between customers and retailers, retailers and distributors, distributors and factories and factories and their myriad suppliers (Raghavan, 2005). Thus, e-commerce technologies are driving increase interactions among customers, business, between business and between customer and business (a set of interacting parties often called electronic community). But, therein arises a fundamental question: is the interface within and between various parties (B2B, B2C, C2B, C2C), the only thing that is important to e-commerce? The answer is decidedly "no". In fact, e-commerce can be attributed, among many factors; or can say that many factors can be held responsible for the successful operations and performance of e-commerce. Among them, e-commerce infrastructure is the most important. It is needed not only to support e-commerce transactions; but also to realize the potential exist in any market.

E-Commerce Infrastructure

E-Commerce infrastructure consists of the shared infrastructure and services necessary to provide secure electronic payment system, secure transactions, and trust services to multiple independent businesses in a region or country. Actually, the term ‘e-commerce infrastructure’ is quite confusing. To many experts of e-commerce, e-commerce infrastructure means ‘Internet Infrastructure’. But, in real sense, e-commerce infrastructure is a wide area, which includes, technology, business, logistics, financial, legal and funding requirements (ITU, 2000). Rao, et al. (1999) explained, e-commerce infrastructure is consists of: payment gateways, secure channels, digital certification authorities, overnight courier services, third party audit services and online ticketing capabilities. Thus, e-commerce infrastructure is much more than Internet payment system, security etc.; it is that part of e-commerce, without which any

e-commerce transactions can't take place. It is the reason; e-commerce infrastructure is also called as 'backbone' of e-commerce. With an objective to study the present status of e-commerce infrastructure in India, the e-commerce infrastructure has been divided into 3 categories:

(i) Technological Infrastructure (E-Commerce Technologies)
(ii) Telecommunication Infrastructure and
(iii) Legal Infrastructure

Technological Infrastructure for E-Commerce

Several technologies are needed for e-commerce to exist. The most obvious one is the Internet. But, beyond that system of interconnected networks, many other sophisticated software and hardware components are needed to provide the required support structure; database software, network switches, and hubs, encryption, hardware and software, multimedia support, and the world wide web. Methods of connecting all the software and hardware elements is just the right way to support electronic commerce is changing and evolving everyday (Sengupta et al., 2005). But, examining e-commerce technologies is a complex system, it is better to break it up into a number of layer (parts) where each part has a specific function to perform. Kalakota and Whinston, (1999), also identified, the e-commerce system may also be thought of as consisting of many layers, each layer providing a service. Each layer has a specific function and can be described separately. One possible layered architecture of e-commerce is given in table 1.2. The lower layer supports the upper ones. This provides us a logical means of discussing the architecture of e-commerce technologies. There are five layers to logically discuss e-commerce technological system. Each layer has a function and support the layer above it (Rajaraman, 2005). The bottom-most, layer is physical layer. This layer includes physical infrastructure such as cables, wires, satellites, mobile phone system etc. The next layer is the logical layer; it defines protocols (i.e. a set of mutually agreed rules) to communicate logically between computers connected by physical network. Internet is a worldwide network of computers that communicate with one another using a particular

---

6 Few years ago, e-commerce technologies were focused primarily handling transactions and managing catalogs. Businesses, however, are evolving beyond transaction support to include content management personalization, integration and marketplace enablement.
8 Kalakota, Ravi and Whinston, B. Andrew (1999), Frontiers of e-commerce, Additison-Wesley/Logman, MA.
9 All the services provided by the layers described below are essential to support e-commerce application, namely, B2B, B2C, C2C, C2B. This is in fact the top layer in the layer architecture of e-commerce technologies.
11 The most function of this layer is to provide the communication infrastructure for e-commerce. In fact, without high speed, reliable electronic communication, e-commerce is not possible. The emergence of wireless communications has enabled one to use mobile hand-held computers which is turn has resulted in the emergence of mobile commerce, abbreviated to m-commerce.
A protocol known as TCP/IP (Transmission Control Protocol/Internet Protocol). Figure 1.2 presents a layered technological architecture of e-commerce system.

## Figure 1.2: A Layered Technological Architecture of E-Commerce System

<table>
<thead>
<tr>
<th>Layer</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Application Layer</strong></td>
<td>• B2B e-commerce • B2C e-commerce • C2B e-commerce and • C2C e-commerce</td>
</tr>
<tr>
<td><strong>Middleman Services Layer</strong></td>
<td>• Value Added Networks • Digital Signature Certifying Authority • Electronic Payment Schemes • Electronic Cash • Hosting Services</td>
</tr>
<tr>
<td><strong>Messaging Layer</strong></td>
<td>• Digital Encryption Standard • Advanced Encryption Standard • Public Key Encryption • Digital Signature • Electronic Data Interchange</td>
</tr>
<tr>
<td><strong>Network Services Layer</strong></td>
<td>• E-mail • World Wide Web Services, Browsers • Hyper Text Transfer Protocol (http) • Hypertext Markup Language (html) • Extensible Markup Language (XML) • Search Engines • Software Agents</td>
</tr>
<tr>
<td><strong>Logical Layer</strong></td>
<td>• Internet • Intranet • Extranet • Firewalls</td>
</tr>
<tr>
<td><strong>Physical Layer</strong></td>
<td>• Local Area Networks (LAN) • Public Switched Telephone Networks • Private Communication Networks • Optical Fibre and Coaxial Cable Networks • Routers • Satellite based Networks • Cellular Networks • Wireless Networks</td>
</tr>
</tbody>
</table>

12 The worldwide acceptance of this standard has led to the emergence of the Internet as the essential infrastructure for e-commerce. The simplicity of connecting computers from diverse manufacturers using TCP/IP protocol led to the explosive growth of the Internet and its wide acceptance. Organizations found it attractive to use the same protocol, namely, TCP/IP to interconnect computers within their organization. Such a local network within an organization is called ‘Intranet’. Another technology, which is used, is ‘Extranet’. An extranet is a private network that uses Internet technology and the public telecommunication system to securely share part of a business’s information or operations with authorized users, such as suppliers, vendors, partners, customers, or other businesses. This protocol is also, of course, TCP/IP. The Internet allows anyone to connect to it. It is thus vulnerable to misuse by anti-social elements that break into others computers and steal or destroy valuable files. Special precautions are required to prevent unauthorized access. This is provided by what are known as firewalls, a very common technical measure used by organizations to protect their IT systems from unauthorized access.
The next higher layer is network services layer. This provides services on the Internet infrastructure. The most important service originally was e-mail service. Currently, the most important service is the world wide web (www) service, which provides users convenient access to information, stored in computers anywhere in the world. Other services, which make e-commerce possible, are: html13, XML14, browsers15 and search engines. Among the most important requirement of e-commerce is exchanging messages and documents between participants in e-commerce. For example, purchase orders, delivery notes etc., have to be sent electronically. The cheapest means of doing it is using the Internet16. The next layer “middleman services”. They are essentially services provided to e-commerce participants to make their dealings easier17.

### Telecommunications Infrastructure

Telecommunication infrastructure and economic development are tightly linked. The ‘adequate’ level of telecommunication infrastructure18 in a country is necessary both from a policy and a business point of view. Rapid expansion of e-commerce technology in the past few years has made the government force to provide adequate telecommunication infrastructure19. Therefore, making the development of an adequate telecommunication infrastructure has become one of the major goals of policy makers.

---

13 Hyper Text Markup Language (HTML), invented by Tim Berners Lee in 1989, is the undergirding framework of the Internet. Almost every web site in existence uses the HTML language to display text, graphics, sounds, and animations. This language is derived from old web language called Standard Generalized Markup Language (SGML). HTML is made up of a services of “elements”. They act as a language which tells the receiving browser to display certain elements on the screen.

14 A derivative of SGML, eXtensible Markup Language (XML) is less restrictive than HTML’s well-defined, standardized elements. XML allows anyone to create her own elements and extend the language herself. (McGlure, Stuart; Shah Saumil and Shreeraj Shah (2003). Web Hacking, Singapore: Pearson Education.

15 The tool (program) that allows you to surf the web. The most popular browsers are Microsoft Internet Explorer (MSIE), Netscape Navigator and America Online’s Custom browser {Maidan, M.C. (2001)}, Dictionary of E-commerce, New Delhi, Himalaya Publishing House.

16 Internet being accessible to everyone there is always the danger of messages and documents being maliciously altered by unscrupulous persons. Thus, there is a need to send messages, which are coded using a secret code. It is also necessary to have an equivalent of signing in the electronic medium. These requirements namely encrypting messages to ensure security and digital signature to authenticate communication received electronically are provided by the messaging layer.

17 Some important middleman services are secure payments using credit card, imitating cash payments for small purchases and authentication of digital signatures. Value added networks provide secure electronic transactions among the participants. Hosting services provide among other facilities, web presence for organizations and electronic catalogues and directories etc., to participate.

18 The difficulty is to determine what “adequate” means in any particular case. Different countries and cultures have different needs and goals that can be attained in a multiplicity of ways. For example, in the 1970s, a popular joke in France went “half of the French are waiting for a telephone, the other half are waiting for the tone”. France was lagging behind the, next by Europe in terms of fixed line equipment. However, when the country decided to catch up, it altogether skipped the analog fixed line step and leapfrogged to an entirely digital telephone network, which might have appeared as a non-basic (more expensive) infrastructure. France’s PSTN is today one of the most modern in Europe.

Telecommunication infrastructure consists of many components. It is a combination of civil works, towers, antennae and cables, coupled with hardware and software comprising access, switches and transmission systems all combine to constitute the telecommunication infrastructure. Optical fibre cables, terrestrial wireless, satellite systems and Internet are all key components of the modern infrastructure. Rapid growth of Internet has also created huge new demand for the broadband access.

Telecommunication infrastructure Scenario in India

During the last decade or so, the Indian telecom sector has seen continued liberalization. Telecom services, which were the sole monopoly of the government till 1994, were opened to the private sector. The National Telecom Policy announced in 1994 separated the functions of the government from those of providing services, and allowed the private sector to provide telecom services\textsuperscript{20}. In 1998, New Internet Policy went into Effect: ISP business opened up to the operators other than DOT (Department of Telecommunication) and VSNL (Videsh Sanchar Nigam Limited). The policy was further liberalized in 1999\textsuperscript{21}. The Department of Telecommunications (DOT) was corporatized in year 2000 with the creation of BSNL\textsuperscript{22}(Bharat Sanchar Nigam Limited). The National Long Distance Services on the domestic routes, that were the sole monopoly of the government, were also opened to the private sector in the year 2001. In 2002, government transfers the control of VSNL to Tatas through sale of strategic holding. In the same year, International Long Distance (ILD) sector opened to competition by ending VSNL monopoly and in April government allowed restricted IP Telephony. And very recently in 2004, government announced new broadband policy ‘New Broadband Policy, 2004’. These policies have had a positive effect in the last few years. The teledensity which was only 1.3 % in 1996, 2.86 % in year 2000, rose to 8.40% in November 2004 and is expected to grow to 4.34 times by 2007. Graph 1.1 indicates the tele-density per 100 Population of India.

\textsuperscript{20} The policy also recognized the need for the establishment of an independent telecom regulation. As a result, a number of private companies were given licences for providing mobile telephone services, and more recently for fixed live telephone services.


Graph 1.1: Tele-Density per 100 Population

Internet, which is popularly known as backbone of electronic commerce, also registered rapid growth in India within a few years. However, during the first few years the growth of Internet subscriber base grows very slowly. By the end of March 1998, it had barely reached 1,40,000 subscribers. The end of VSNL’s monopoly changed the things dramatically wherein, the entry of private players, unlimited and open competition, and the lowering of tariffs, among other factors led to the phenomenal surge in the subscriber base growth. Between March 1999 and March 2001, the subscriber base grew more than 200 percent per year, from 2,80,000 to 3,00,000. Table 1.6 indicates the growth of Internet in India. Table 1.6 and Graph 1.2 indicate the growth of Internet in India.

Sources:
Table 1.6: Growth Rate of Internet in India

<table>
<thead>
<tr>
<th>Year</th>
<th>Subscriber base (Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 1995</td>
<td>0.01</td>
</tr>
<tr>
<td>March 1996</td>
<td>0.05</td>
</tr>
<tr>
<td>March 1997</td>
<td>0.09</td>
</tr>
<tr>
<td>March 1998</td>
<td>0.14</td>
</tr>
<tr>
<td>March 1999</td>
<td>0.28</td>
</tr>
<tr>
<td>March 2000</td>
<td>0.90</td>
</tr>
<tr>
<td>March 2001</td>
<td>3.00</td>
</tr>
<tr>
<td>March 2002</td>
<td>3.30***</td>
</tr>
<tr>
<td>March 2003</td>
<td>4.00*</td>
</tr>
<tr>
<td>March 2004</td>
<td>4.93**</td>
</tr>
</tbody>
</table>

*Telcom Regulatory Authority of India (TRAI), 2003
** ASSOCHAM.
***Against projected figure of 4.5 million
Source: Internet Service Provider’s Association of India.

Graph 1.2: Growth of Internet in India

However, from April 2001 onwards growth rate started declining on all India basis. Presently, there are about 5 million Internet subscriber and 40 million Internet users in India (Sukumar, 2005)\(^23\). They are expected to grow 3.6 times of present, by the year 2007 (ASSOCHAM).

PC penetration is another key components of Telecom Infrastructure for the development of e-commerce. In fact, Internet is penetration is directly related to the PC penetration\(^24\). Study of Purohit and Purohit (2005)\(^25\) indicates that low PC penetration in the country is the most important reasons behind the slow growth of Internet in India. Table 1.7 indicates trends in the PC penetration in India.

\(^24\) PC is the most important instrument for accessing Internet.
Table 1.7: PC Penetration in India

<table>
<thead>
<tr>
<th>Years</th>
<th>PC Penetration (per 1000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 1997</td>
<td>1.63</td>
</tr>
<tr>
<td>March 1998</td>
<td>2.17</td>
</tr>
<tr>
<td>March 1999</td>
<td>2.83</td>
</tr>
<tr>
<td>March 2000</td>
<td>3.72</td>
</tr>
<tr>
<td>March 2001</td>
<td>4.94</td>
</tr>
<tr>
<td>March 2002</td>
<td>6.41</td>
</tr>
<tr>
<td>March 2003</td>
<td>7.81</td>
</tr>
<tr>
<td>March 2004</td>
<td>9.63</td>
</tr>
<tr>
<td>March 2005</td>
<td>11.92</td>
</tr>
</tbody>
</table>

Source: Nasscom

Added to the infrastructure development in the above sector, as a result of government policies a number of ISPs (Internet Service Providers) have come into being which have spearheaded the growth of Internet connectivity in a big way. Over 250 ISPs are fully operated in India at present. Graph 1.3 indicates the market share of major ISPs in percent ages.

Graph 1.3: Market Share (%) of Major ISPs

Source: TRAI (Telcom Regulatory Authority of India, Performance indicators April-June, 2005

The graph depicts that among them the most important market players are: BSNL (with the market share 34%), MTNL (19%), Sify (14%), Reliance Infocom (5%), Tata Infosys (4%), Bharti Infotel (3%) and others (11%).

Mobile phone penetration which was only 0.34 million in 1997, 1.88 million in 2000, reached to the level of 44.50 million in 2004. Graph 1.4 indicates the growth of mobile phone users in India.
Graph 1.4: Growth of Mobile Phone users in India (in million)

<table>
<thead>
<tr>
<th>Year</th>
<th>Mobile</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>0.34</td>
</tr>
<tr>
<td>1999</td>
<td>1.2</td>
</tr>
<tr>
<td>1998</td>
<td>0.88</td>
</tr>
<tr>
<td>2001</td>
<td>3.58</td>
</tr>
<tr>
<td>2002</td>
<td>6.43</td>
</tr>
<tr>
<td>2003</td>
<td>12.69</td>
</tr>
<tr>
<td>2004</td>
<td>33.7</td>
</tr>
<tr>
<td>2004</td>
<td>44.5</td>
</tr>
<tr>
<td>2005</td>
<td>46</td>
</tr>
</tbody>
</table>

Source:


At present there are 0.23 million broadband users (0.2 per cent) which is expected to touch the level of 9 million by the year 2007. The PC penetration is expected to grow from the current level of 1.1% to 2.5 times by 2007. Broadband users are expected to grow 40 times of present. Another reason for hope is that India is expected to have 200 million mobile telephony subscribers by the end of 2008, if not by 2007.

Status of India’s Telecommunications Infrastructure: A Comparison

No doubt, India has great opportunities in e-commerce compared with many other developing and developed countries, but opportunities offered by e-commerce can be availed only with sound infrastructure (Sumanjeet, 2005, Sumanjeet & Gandhi, 2006, and Prakash, 2002). To tap these opportunities Government of India has already taken number of initiative to boost and strengthen the entire infrastructure of e-commerce in India. As a result of these initiatives, India’s Telecom sector has registered a rapid growth within few years. Even with the tremendous growth of telecom infrastructure, India still lagged behind even among the Asia Pacific countries.

---

Table 1.8: Key Comparative Indicators of Telecom Infrastructure (End of 2003)

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Korea</th>
<th>Malaysia</th>
<th>China</th>
<th>India</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Access &amp; infrastructure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of PCs per 100</td>
<td>78.6</td>
<td>15</td>
<td>2.8</td>
<td>0.8</td>
</tr>
<tr>
<td>No. of cable TVs per 100</td>
<td>43</td>
<td>0</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>No. of fixed telephone lines per 100 persons</td>
<td>51</td>
<td>18.5</td>
<td>18.0</td>
<td>3.9</td>
</tr>
<tr>
<td>No. of mobile phones per 100 persons</td>
<td>75</td>
<td>43.9</td>
<td>18.3</td>
<td>2.6</td>
</tr>
<tr>
<td>GDP (US$ per capita)</td>
<td>10000</td>
<td>4000</td>
<td>965</td>
<td>465</td>
</tr>
<tr>
<td><strong>Internet</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of internet connections per 100 persons</td>
<td>26</td>
<td>12</td>
<td>2.5</td>
<td>0.4</td>
</tr>
<tr>
<td>No. of users per 100 persons</td>
<td>65.5</td>
<td>34</td>
<td>6.2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Broadband</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of broadband connections per 100 persons</td>
<td>25</td>
<td>0.4</td>
<td>1.4</td>
<td>0.02</td>
</tr>
<tr>
<td>Charges for broadband per month (US$)</td>
<td>30</td>
<td>29</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>Charges per 100 kbps per month (US$)</td>
<td>0.25</td>
<td>7.61</td>
<td>3.07</td>
<td>15.63</td>
</tr>
<tr>
<td>Import duty on the customer premises equipment used for broadband</td>
<td>Local Made</td>
<td>----</td>
<td>Local Made</td>
<td>38%</td>
</tr>
</tbody>
</table>

Source: China Internet Network Information Centre; EMC Corporation, February 2004; IT Korea Journal 2004; ITU; Korea Network Information Centre; Malaysia Department of Statistics; World Bank; TRAI (Telecom Regulatory Authority of India) Analysis.

Note: Numbers in *italic* indicates Mid 2003 values.

Table 1.8 indicates that India’s telecom infrastructure is very poor as compared to Korea, Malaysia and China. Korea is leading, followed by Malaysia and China. Key comparative indicators also show that India still has significant scope to grow. At today’s level, though Indians are expected to be 60 times more than subscribers in Korea for the same throughput, which translates to 1200 times more when considering affordability measures based on GDP per capita comparison. For this magnitude of investment\(^{29}\) to occurring the appropriate regulatory environment and policies need to be established so that the discrepancy in pricing between India and Korea can be eliminated. Once this happens, only then will there be successful growth and burners models in Internet.

### Legal Infrastructure for E-Commerce in India

A facilitative and legal framework is *sine qua non* for the promotion and development of technology like electronic commerce (Mehta, 2004)\(^{30}\). Besides developing the e-infrastructure in the country through effective Telecom Policy

---

\(^{29}\) The CII (Confederation of Indian Industries has estimated that investments of at least US$2.6 billion by 2010 and US$3.35 billion by 2020 will be needed to achieve the goals they have set for Internet and Broadband service. “India’s Broadband Economy: Vision 2010, Vision, Strategies and Recommended Action”, Confederation of Indian Industry, Department of Information Technology and Department of Telecommunications, Prepared by IBM Business Consulting Services, March 2004.

measures, the Indian Government is taking appropriate steps as confidence building measures for the growth of e-commerce. It has created the necessary legal and administrative framework through the enactment of Information Technology Act 2000, which combines the e-commerce transactions and computer misuse and frauds rolled into an Omnibus Act. While on the one hand it seeks to create the Public Key Infrastructure for electronic authentication through the digital signatures, on the other hand, it seeks to build confidence among the public that the frauds in the cyber space will not go unpunished. The Controller of Certifying Authority (CCA) has been put in place for the effective implementation of the IT Act, 2000. The Act also enables e-governance applications for the electronic delivery of services to the public, business and government.

The Information Technology Act, 2000 and E-Commerce

The Information Technology Act 2000 is based on the Model Law on E-Commerce adopted by the United Nations Commission on International Trade Law (UNCITRAL) and pioneering e-commerce enabling legislations such as the Utah Digital Signatures Act, 1995; the Singapore Electronic Transactions Act, 1999 and the Malaysian Electronic Signatures Act. The main objective behind the introduction of IT Act, 2000 is to encourage the environment in which the laws are simple and transparent and in which the advantages of e-commerce can be tapped (Sumanjeet and Mahlawat, 2004).

The Act aims to provide legal recognition for the transactions carried out by the means of electronic data interchange and other means of communications, commonly referred to as “Electronic Commerce”, which involve the use of alternatives to paper based methods of the communication and storage of information, to facilitate electronic filing of document with the government agencies. The Act comprises of the three significant aspect of e-commerce:

- Legal recognition of electronic records and communications- contractual framework, evidentiary aspects, digital signatures as the method of...

---

31 Chapter IV of the IT Act, 2000 deals with the regulation of Certifying Authorities. The Central Government may appoint a Controller of Certifying Authority who shall exercise the supervision over the Certifying Authority. The Certifying Authority means a person who has been granted a license to issue Digital Certificates. The Controller of Certifying Authority shall have the powers to lay down rules, regulations, duties, responsibilities and functions of the Certifying Authority issuing Digital Signature Certificates. The Certifying Authority empowered to issue a Digital Signature Certificate shall have to procure a license from the controller of Certifying Authority to issue Digital Signature Certificates.

32 Chapter III of the IT Act, 2000 deals with the electronic governance. Where any law provides submission of information in writing or in the type written or in the printed form, from now onwards it will be sufficient compliance of law, if the same is sent in electronic form. Further, if any status provides for affixation of signatures in any document, the same can be done by the means of Digital Signature.

33 In May 2000, both the houses of the Indian Parliament passed the Information Technology Bill. The Bill received the assent of the President of India in August 2000.

34 UNCITRAL Model Law, 1996 states that in the context of contract formation, unless otherwise agreed by the parties, an offer and the acceptance of an offer may be expressed by the means of “data message”. Valid contracts can therefore, be formed where offer and acceptances is conveyed via the Internet.


36 Taxmann’s IT Act (2000), Information Technology Act 2000, New Delhi: Taxmann’s Allied services Ltd.
authentication, rules for determining time and place of dispatch and receipt of electronic records.

- Regulation of Certification Authorities - appointment of a Controller of CAs, grant of license to CAs, duties vis-à-vis subscribers of digital signature certificates, recognition of foreign CAs.
- Cyber contraventions - civil and criminal violations, penalties, establishment of the Adjudicating Authority and the Cyber Regulatory Appellate Tribunals

As the Act establishes the legal validity and enforceability of the digital signature and electronic records as well as the secure digital signatures and secure electronic records, it will enable the growth of e-commerce in India, because the secure computer based signatures will:

- Minimize the incidence of electronic forgeries.
- Enable and foster authentication of computerized communications.
- Facilitating commerce by the means of electronic communications.

Further, electronic filing of records and retention of information in electronic formats, enabled by the IT Act, 2000 will help in saving costs, time and manpower for the corporate (Duggal, 2000)37.

By virtue of the recognition given to the electronic records, electronic documents and electronic signature, consequent amendments have been made in some existing laws. The Act amends the Indian Penal Code, 186038, the Indian Evidence Act, 187239, Banker’s Book Evidence Act, 189140 and the Reserve Bank of India Act, 193441, and for the matters connected therewith or incidental thereto. The main purpose of these amendments is to address the related issues of electronic commerce, electronic crimes and evidence, and to enable further regulation as regards electronic fund transfer.

Security Provisions of the IT Act, 2000

One of the most important issues in the context of e-commerce relates to the security of business and commercial transactions. A security threat in term of Internet has been defined as a circumstance, condition or even with the potential cause economic hardship to data/network resources in the form of destruction, disclosure, modification of data, denial of services, fraud and abuse.

38 The Act makes numerous amendments to the Indian Penal Code. By the virtue of section 91 of the IT Act, the amendments to the IPC, as described in the first schedule of the IT Act, take effect. Most of these amendments are in the nature of recognizing the validity of electronic documents and electronic signatures. They amend existing IPC offences such that these offences will also be punishable if committed with regard to electronic counterparts.
39 The key provision that are showed to be made in the Indian Evidence Act relate to widening of the scope of the term “document” to include electronic records. Most important, section 65 B recognizes admissibility of computer outputs in media, paper, and optical or magnetic form. There are detailed provisions related to the admissibility of computer output as evidence. New section 73 (A) prescribes procedure for verification of digital signatures. New section 85 (A) and 85 (B) creates presumption as regards electronic contracts, electronic records and digital signatures, digital signature certificates and electronic message.
40 The Banker’s Book Evidence Act has been amended in the manner specified in the 3rd schedule to the Act (Section 93).
41 The Reserve Bank of India Act, 1934 has been amended in the manner specified in the 4th schedule to the Act (Section 94).
The IT Act 2000 not only amends the Indian Penal Code to bring within its scope conventional offences committed electronically, but also creates a new breed of information technology offences, the prevention of which are incidental to the maintenance of a secure electronic environment for e-commerce. To make e-commerce transactions safe and secure, the IT Act 2000, provides for investigation, trial and punishment for certain offences (these offences are found in Chapter XI of the Act) like source code attacks (section 65), hacking (section 66), obscenity (section 67), failure to comply with the controller’s directions (section 68), subscriber’s failure to Controller’s requirement for decryption (section 69), accessing designated protected systems (section 70), misrepresentation to CCA (section 71), breach of privacy/confidentiality (section 72), publishing false digital signature certificate (section 73), making available digital signature for the fraudulent purpose (section 74) and section 75 of the IT Act deals with the offences or contravention committed outside India which reads as:

- Subject to the provision of sub-section (2), the provision of this Act shall apply also to any offences or contravention committed outside India by any person irrespective of his nationality.
- For the purpose of sub-section (1), this Act shall apply to an offences or contravention committed outside India by any person if the act or conduct constituting the offences or contravention involves a computer, computer system or computer network located in India.

Readiness of E-Commerce Laws in India

The IT Act 2000, in spite of being a special regime for e-commerce, has done little to achieve the objective stated in its preamble. In the current form the Act is completely inadequate as it has several drawbacks and gray areas. Still, there are many important issues and areas, which are very important for the promotion and development of e-commerce in India and they are not covered by the IT Act, 2000. The issues and areas, which are not touched/covered by the IT Act, 2000, are (Sumanjeet and Mehlawat, 2004):

- Electronic payment and how electronic transactions are going to be made.
- Intellectual Property Rights
- Negotiable instruments such as cheque, banker’s orders, pay orders etc.
- E-taxation
- Right and liabilities of the domain name holders- the most basic starting point for anyone interested in e-commerce business.
- WAP (Wireless Application Protocol) and Mobile Commerce.

---

45 Every computer that hosts data on the Internet has a unique numerical address. A domain name always has two or more parts separated by dots and typically consist of some form of an organization’s name and a three letter or more suffix. For example, the domain name for IBM is “ibm.com”; the United Nations is “un.org.”
• Protection of e-consumers and
• Privacy Issues

Added to these, jurisdiction problems are likely to arise as the Act applies to both the Indian and foreign citizens. The laws are presently covered under the civil procedure not criminal procedure, making the enforcement process very slow. This deters the companies from approaching the cyber crime cell. Some definitions in the Act are vogue and cause problems to the plaintiff. Last but not the least; the Act does not lay down parameters for its implementation.

Concluding Remarks

Electronic commerce is a modern business methodology that addresses the needs of organizations, merchants and consumers to cut costs while improving the quality of goods and services and increasing the speed of service delivery. In short, benefits of e-commerce technology are huge and cannot be ignored. But, e-commerce system cannot be operated in vacuum. To facilitate the proliferation of e-commerce, sound infrastructure, which mainly, consists of technical, telecom and legal are required.

• A number of technologies are converged to facilitate the proliferation of e-commerce. Networking, computing, messaging and electronic payment systems are at the core of e-commerce, where the most commonly used infrastructure is Internet, Intranet, Extranet, Firewalls etc. However, these technologies are not sufficient for e-commerce proliferation. Proper management of enterprise information security resources is the need of hour. It is important to note that technologies used in e-commerce are almost same in all the countries, however does vary because of the availability of telecom infrastructure and adoption level of e-commerce in any organization.

• Telecom infrastructure has registered rapid growth in India, within few years. No doubt, government policies have had a very positive impact on the development of e-commerce telecom infrastructure. However, still, even among many developing courtiers, India’s telecom infrastructure is very poor. This is especially true in the context of Internet penetration (Appendix III). In the world’s pie our share is negligible. But, the poor status of telecom infrastructure also indicates that India has significant scope to grow, where many other countries do not have so much. To maximize the efficiency of every possible medium of transmission, including copper cable, fiber optic cables, radio, Internet, telephone and satellite communications, the whole purpose of enabling telecommunications need to be reexamined.

• As more and more business activates are carried out by the electronic means, it has become more and more important that evidence of these activities should available to demonstrate legal rights and obligations that flow from them. India is

46 Wireless Application Protocol or WAP, is the de facto worldwide standard for providing Internet Communication and advanced Telephony services on digital mobile phones, pagers, personal digital assistant and other wireless terminals. Wireless Application Protocol is a standard developed by the WAP Forum, a group founded by Nokia, Ericsson, phone.com (formerly Unwired Planet) and Motorola. WAP defines a communication protocol as well as an application environment. In essence it is a standardized technology for cross-platform, distributed computing. (Accessed on: http://www.auditmypc.com/acronym/WAP.asp)
among the first few countries (Appendix IV), which have passed a separate law enabling e-commerce and other IT enabled services. The IT Act, 2000 is quite comprehensive and well defined. But there are many important issues of e-commerce (e.g. Intellectual Property Rights, Data Protection, Domain Names Disputes, Electronic Payment System, Data Protection, Protection of E-Consumers, Privacy and E-Taxation), which are important for the development of this new technology, but not covered by the IT Act 2000. Added to these issues, the Act is a set too far, the over complex provisions relating to contract formation, the ties to particular technology in the regulation of digital signatures, the over elaborate mechanisms for controlling certification authorities and the attempts to define the technology stand in stark contrast to more minimalist approaches adopted in other jurisdictions. Unless all these legal issues are dealt with, e-commerce cannot really take off in India.